Ministry of Higher Education and Scientific Research
University of Algiers 2- Abou Elkacem Saadallah
Faculty of Foreign Languages
Department of English

The Representation of Climate Change and Environmental Degradation in the Contemporary British Novel: An Ecocritical Analysis of Ian McEwan's *Solar*, Marcel Theroux's *Far North*, Margaret Atwood's *Oryx and Crake* and Sarah Hall's *The Carhullan Army*

Thesis in Partial Fulfillment of the Requirements for the Degree of Doctorate in English Literature

Presented by

Soraya CHIHI

Supervised by

Dr. Assia KACED

The Jury

President: Prof. Houria AIT AMMOUR	**Algiers 2 University**
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Academic Year 2021-2022

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Declaration

I hereby declare that the substance of this thesis is entirely the result of my investigation and that due reference or acknowledgement is made, whenever necessary, to the work of other researchers.

Soraya CHIHI

Signature:

Date:

Dedication

I dedicate this humble work to my family.

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Abstract

This thesis is an examination of the fictional representation of climate change and environmental degradation in four contemporary novels written by British science fiction writers. It analyses the literary discourses through which a number of contemporary British writers respond to the current environmental crisis, and how such cultural responses help in the establishment of a new literary form, climate change fiction. Through a deep ecocritical analysis of Ian McEwan's *Solar,* Marcel Theroux's *Far North,* Margaret Atwood's *Oryx and Crake* and Sarah Hall's *The Carhullan Army*, the thesis seeks to identify these writers' reactions and insights towards climate change and shed light on the literary techniques they use to depict such an issue It also analyses the various methods adopted by these writers to inform their readers about the problem of climate change and stimulate them to rethink and understand the new realities concerning their environment. To reach a sustainable future life, these novelists are among many who call for raising global environmental awareness through literature believing that the literary imagination has a big impact on changing people's culture towards nature. The analysis made in this study proves that these writers agree on anthropogenic climate change, but they differ in terms of presenting it. They offer readers various narratives depicting climate change and environmental degradation, or the Anthropogenic, from different perspectives, starting with the dilemma of an ambitious and greedy scientist in McEwan's *Solar*, the collapse of a flawed society in Theroux's *Far North,* Forecasting Covid-19 in Atwood's *Oryx and Crake,* and flooding in Hall's *The Carhullan Army.* Through such presentations, these writers show that climate change and environmental degradation influence language as well, and lead, in some cases to its loss.

Keywords: Climate change, environmental degradation, ecocriticism, ecofeminism, Ian McEwan's *Solar,* Marcel Theroux's *Far North*, Margaret Atwood's *Oryx and Crake,* and Sarah Hall's *The Carhullan Army*.

Table of Contents

INTRODUCTION

Although climate change has always been a scientific and geological topic of interest, it has, recently largely spread to become a dominant subject discussed in many humanistic fields, including literature, where writers have speculated it in terms of storytelling. In their narratives, these writers have attempted to present it coping with all its aftermaths that have become serious, especially, during the last decade. In particular, the starting years of the 2020's have witnessed the appearance of Covid-19, the global health crisis that has affected all domains of life all over the world. The appearance of this deadly virus has shaken the human minds and their imagination to question the possibility of the existence of a relationship between climate change and human health.

This research, therefore, is an attempt to build a bridge between reality and fiction; it focuses on the study of the representation of climate change and environmental degradation in literature, in particular, in four contemporary novels, Ian McEwan's *Solar* (2010), Marcel Theroux's *Far North* (2009), Margaret Atwood's *Oryx and Crake* (2003), and Sarah Hall's *The Carhullan Army* (2007). The four selected novels tackle climate change and environmental degradation from different perspectives; each novel gives a specific vision of what climate change may lead to: the collapse of the individual in *Solar*, the collapse of civilization or the human society in *Far North*, flooding in *The Carhullan Army*, and above all the degradation of human health, or in other words the appearance of a deadly virus in *Oryx and Crake.* Though

the choice of the selected novels was made years before the appearance of Covid-19 virus, and its effects on people and life in general, it helped in providing new perspectives of how to read and analyze Atwood's *Oryx and Crake.* What Margaret Atwood foretold years ago in her novel, the whole world is experiencing today. Atwood imagined that climate change would lead to the appearance of a deadly virus named JUVE that would cause the distinction of the human race. Thus, the ecocritical analysis made in this research has been crossed up by up-to-date changes that help to bring insight about climate change on the one hand, and about methods of analyzing eco-critical literary works on the other hand.

Recently, rapid changes in climate have led to environmental degradation and natural disasters. Observations and climate scientific data have shown the existence of dangerous changes in climate. These changes may affect not only specific species but the human race in general. Human and non-human beings are under the threat of this worldly phenomenon whose impact is felt and diagnosed locally as well as globally. According to World Health Organization (2003), "There is now widespread consensus that the Earth is warming at a rate unprecedented during post hunter- gatherer human existence. The last decade was the warmest since instrumental records began in the nineteenth century, and contained 9 of the 10 warmest years ever recorded" (*Climate Change and Human Health* ix). For the environmentalists, this climate change is a human- made phenomenon; human greed to possess more wealth has exceeded even

the frontiers of the natural world since natural resources have become an unlimited field to gain more.

Already, in the 1960's writers started worrying about climate change and the effects of environmental degradation on human health. Rachael Carson, for example, in her book, *Silent Spring* (1962) discussed ecological toxicology in environment or the negative outcomes of the chemical pesticides that were largely used at the time, and that were considered as an important aspect of agricultural innovations in the USA. In literature, the Anthropocene, or climate change and environmental degradation, have become an interesting field of study. Forecasting the phenomenon and its impacts on nature and the human race have been widely used in science fiction, where writers have applied the 'what if theory' to present this contemporary global environmental challenge. These writers consider it as an issue that crosses national borders and involves worldwide cooperation. For them, literature can play a very important role to raise people's awareness towards the different risks that this environmental crisis may lead them to, and save their future on Earth. Moreover, climate change has become a very controversial topic that has transcended other sciences to emerge as a dominant theme in literature. This has given rise to the term, 'climate change fiction,' or 'cli-fi,' which has been classified as the hottest emerging subgenre in science fiction in the last decade (Milner 23).

For ordinary people, climate change is a natural process in nature that takes

place without too much impact on their lives. However, for environmentalists, scientists and eco-friendly people, it is a big danger that humanity has to consider seriously in order to protect the lives of people and the planet on which they live. Different methods and ways have been used to make people more aware of the danger that awaits them if they do not protect their environment. Accordingly, ecofriendly writers in literary works, present environment not only as a setting in a story but also as a major theme with serious impact on characters and plot, and where relationships between humans' and non-humans' lives are put under scrutiny. With such works, where environment is at the center of the work, the writers wish to prompt, provoke, and inspire actions from readers to work hand in hand and stop the harm done to nature.

In addition to portraying the numerous harmful human activities towards nature, these writers try to address climate change with its environmental damages to help the readers better understand and consider the balanced relationship between man and the universe. Ian McEwan, Marcel Theroux, Sarah Hall, and Margaret Atwood are among the most influencing writers who have shown their concern about the degradation of the eco-system and their desire to protect the environment. They have used their eco-literary imagination to raise awareness among readers about this serious problem.

Ian McEwan, Marcel Theroux, and Sarah Hall, in their respective novels, *Solar* (2010), *Far North* (2009), and *The Carhullan Army* (2007), aim at raising global

awareness and enhancing public response to the environmental degradation through calling for local actions for common social transformations. They believe that if awareness towards such problems grows, people become more engaged to find solutions and pay more attention to the demands of nature.

Although Margaret Atwood is Canadian and not British as the three other writers, her work, *Oryx and Crake*, will be studied with the works of Ian McEwan, Marcel Theroux, and Sarah Hall because Atwood has written her novel, *Oryx and Crake*, following the same British tradition of climate fiction which fits into the category of 'alarmist novels', meaning novels written for the purpose of warning people about the danger of climate change. The other reason behind the choice of her novel tackles the problem of eco-system degradation from a global perspective. Her novel represents all human beings without exception.

The writers under study all have the same vision of the future and consider that since climate change is a universal concern and a global threat for all human beings without exception, the whole world should feel the need to make changes in their lifestyle. They should also take action to combat this ecological crisis and think about a more suitable and safer source of energy to stop global warming. In fact, climate change literature aims at informing people about their relationship with environment, and how such environment is at risk because of their behaviours and their misuse of

scientific progress and technological developments, especially, the expulsion of CO2 into the atmosphere.

This research work, thus, seeks to explore and investigate from a literary perspective, the way people are destroying both nature and themselves with such uncontrolled technology. Thereby, the research aims first at introducing climate fiction and discussing the problematic issue of representing climate change and the multiple environmental transformations. Second, it intends to analyze the way fictional works depict the impact of climate change on human and nonhuman lives and identify both the responsibilities of the individual, society and superpowers, and the consequences of being unconcerned about nature. Finally, it plans to establish a link between the early literary reactions towards environmental issues and the new ones.

To reach such aims, it is necessary to ask a number of questions related to climate change, ecological awareness, and the role of the writer as an eco-friendly influential figure in developing environmental consciousness and seeking effective action to protect the ecosystem. Accordingly, a series of questions are raised to which we seek to find answers through the different parts of this study: How does the environmental crisis seep into contemporary literature? How do writers, Ian McEwan, Marcel Theroux, Margaret Atwood, and Sarah Hall, present climate change and environmental degradation in their narratives? What solutions can novelists suggest to solve this problematic? Or in general, can the British novel and literature in general

succeed to increase peoples' awareness about the risks of climate change, and the importance of fighting global warming that threatens the whole world?

Methodologically, this research aims at analyzing of a selected set of novels written by male and female writers from the core of the current environmental problem, which is climate change. We have selected twenty-first century novels written at a time when global warming and the increased public consciousness about anthropogenic climate change have become a relevant topic due to all the atmospheric changes that planet Earth has been witnessing. We have considered both ecocriticism and ecofeminism as the most suitable literary theories to be used in this research since both theories are concerned with the relationship of Man with his environment.

Ecocriticism is known as environmental criticism or ecological literary criticism, which is the study of the relationship between literature and the environment; whereas, ecofeminism is "a movement that shows the link between the degradation and exploitation of nature besides the oppression of women by men" (Alkhattabi 1).

Ecocriticism appeared in the twentieth century but it flourished during the last decades of the century. It aims at studying literature from an environmental perspective and seeks to investigate the representation of nature in literature. In addition to race, class, and gender, eco-critics have added another critical category, which is 'place.' Thus, in this study, the focus will be put on how climate change and ecological

degradation are represented in the selected novels: *Solar, Far North, Oryx and Crake,* and *The Carhullan Army* since environmental degradation and global warming are considered as a global threat in these novels, and how ecological consciousness is raised, by their authors, about such environmental degradation.

Climate change has become a very challenging topic in both scientific and non-scientific fields. In literature, climate change, environmental degradation, and ecosystem threats have become a cause to debate for many writers and critics from the whole world who try to show their stances towards this dangerous phenomenon and communicate them with their audiences through their literary works. Thereby, this research is based on a wide investigation including different sources whose authors try to highlight the danger of climate change as a man-made phenomenon, and the possibility of shrinking it with the contribution of all.

To start with, in *An Environmental History of the World Humankind's Changing Role in the Community of Life,(* 2009) J. Donald Hughes relates the widespread of environmental degradation to the emergence of imperialism and the two World Wars that caused a massive destruction in the aftermaths of the Industrial Revolution. Even Mother Earth, with its ecosystems, was damaged, causing negative impacts on the environment; forest plants, soil, fish, air and water; all were damaged and polluted by the coal and chemical wastes, trains' smoke, the steam of factories' engines, and acid rains. He asserts: "Viewed on a world scale, the two great wars were the most

destructive of life, both of humans and of the biosphere, in history. The ecosystems of the Earth were damaged in ways unknown before, although few of the writers who commented on the fact expressed it in those terms. Rather, they talked about the depletion of natural resources. A few, like Fairfi Eld Osborn, wondered if the cornucopia was about to run out of riches" (154). In addition to J. Donald Hughes' views, human beings' will to control nature through advanced science and technology is also another ultimate cause that has led to its destruction. Therefore, in this research, the attention will be put to study the relationship between the characters and their environment and highlight their behaviours that destroy it as an attempt to show closely the correlation between man and his environment.

In "Introduction: Literature, Science, and the Natural World in the Long Nineteenth Century," Claire McKechnie et al raise the fact that discussing environmental issues is not only a contemporary concern. In this work, they make a very informative comparison between the multiple views given to nature throughout the various literary periods, the Romantic, the Victorian, and the contemporary. They state, "Yet humanity's ability, and its right, to control nature were also debated and questioned over the course of the nineteenth century, a period which saw rapid social, industrial, and scientific change, bringing the natural world to the forefront of the Victorian cultural imagination." According to them, John Ruskin's *The Storm-Cloud of the Nineteenth Century* (1884) is an example to reflect such concerns; the image of clouds the writer uses depicts the meteorological omens of the effects of scientific

investigation and modern industrialization, illustrating how,

> The natural world itself responded to changing times and a changing Britain. The natural world was intricately bound up with how Victorians thought about themselves and how they related to their social world, to the extent that we can hardly extricate the idea of nature from the idea of the nineteenth-century imagination." (1)

McKechnie et al emphasize that global sustainability in the twenty-first century has become a very widespread topic that has gained the interest of many socialists, environmentalists, and economics, and the position of nature in such debates is very important. They illustrate that the majority of these debates about the relationship between the human and non-human worlds are not recent and were questioned previously by nineteenth century writers, but they had arose contemporarily as a reaction towards the human beings' belief that through advanced science and technology, humanity is able to control the natural world, and through this current research, the interest has been put to testify this claim. What has been noticed in the four selected novels of this research, characters are living in higher scientific and technological but collapsed settings to show how human behaviours guide the scientific progress not only to benefit from it and reach valuable usages but also to be the cause that harms nature and leads then to its destruction and loss.

In her book, *Climate Crisis and the 21st-Century British Novel* (2020), Astrid Bracke, in an attempt to bring ecocriticism into dialogue with contemporary fiction,

investigates a number of novels forcing readers to rethink about the conventional approaches about nature. Through her book, which is considered as the first study charting such altering attitudes in the twenty first century British fiction, she explores the techniques used in recent fiction, which employ four diverse environmental narratives: the pastoral, the urban, the polar, and climate change. The aim behind this study is to illustrate the new critical category concerning the contemporary fiction, the imaginative space, which is used in order to push readers to rethink about their relationship with the natural world. In these literary works, the writers focus on painting pictures of worlds living under fear and alarming levels of ecological degradation.

In his informative work, *Anthropocene Fictions: The Novel in a Time of Climate Change* (2015), Adam Trexler analyses a wide range of climate novels. In his book, Trexler offers an explanatory survey about the subgenre and its development during the last decades. According to him, climate is more than a theme. Rather, it is an articulation and an examination of the politics, economics, new technologies, and disasters of the Anthropocene,[1] finding that recent novels about climate change have become more innovative in terms of including political and ecological tones and complexities (9). This reflects the fact that a new set of techniques has been required to tackle such a topic in novels recasting the old ones. Therefore, this research will shed

[1] **The current geological era in which human activity has become the dominant force on climate and environment.**

light on such new techniques in *Solar*, *Far North*, *Oryx and Crake*, and *The Carhullan Army* to help represent climate change and its environmental degradation.

Variations among nature writers and environmental themes have led to variations in environmental narratives. In his article, "Writing Catastrophes: Interdisciplinary Perspectives on the Semantics of Natural and Anthropogenic Disasters (2012) Gabriele Durbeck discusses environmental narratives, the multiple representations of natural and anthropogenic catastrophes and ecological transformation in English and German literature from 1950 to the present. He argues: "literary disaster discourses are characterized by a fundamental tension between the aesthetic and ethical aspects of destruction" (1). In the light of this, he distinguishes between three aspects of disaster narratives: apocalyptic scenarios and risk narratives, narrative patterns and the semantics of disaster literature; and the role of literature as a medium of cultural discourse.

Durbeck considers the first discourse, apocalyptic scenarios and risk narratives, as a very significant discourse in contemporary British environmental literature. He asserts through the depiction of environmental disasters, the apocalypse has become the chief narrative in this body of writing, where the catastrophe is considered as some kind of punishment or a revenge taken by nature against man. He adds that these punitive narratives, whether they are utopian or dystopian, optimistic or pessimistic, tragic or comic, provide meanings of anxiety, suffering, loss and displacement. Therefore, drawing on global imaginaries, and based on moral or

religious considerations, the apocalyptic discourse (or the risky discourse) emphasizes the fate of the whole world and aims at raising consciousness to make important alterations in societies for the sake of Mother Earth. However, in this research, the claim has been put towards how the post-apocalyptic discourse also provides big impact on warning readers about the global environmental issues; through *Far North*, *Oryx and Crake*, and *The Carhullan Army*, such consciousness is raised globally via post-apocalyptic settings to show that climate change and environmental degradation are felt both locally and globally. Thus, the current study shows, especially, with the appearance of Covid-19 and enhancing a new reading to Margaret Atwood's *Oryx and Crake*, that pandemic narratives are vital to reflect the nature of the relationship between human beings and the environment during the 2020's.

Durbeck also stresses that in contemporary disaster discourse, secular (earthly) issues are joined with religion because the latter still plays a vital role to scare readers in order to transmit to them a very specific meaning, to put them in front of contingent events, such as, natural disasters, considering the role of literature as a medium of cultural discourse. He illustrates the way literature offers catastrophes with scientific, religious, ethical or political meanings and how it transforms events into craftily designed images and tropes and integrates them into cultural discourses. Thereby, he admits that through employing ironic and satirical strategies, many environmental disaster narratives contribute to transmit ecological warning messages (3). In Ian

McEwan's novel, *Solar* (2010), for example, the author writes a satiric-allegorical risk narrative where irony plays an important role in denouncing nature -laws tress passing.

These ecological warning messages are clearly carried out by Paige Costello in *Prose and Polarization: Environmental Literature and the Challenges to Constructive Discourse,* where he calls for reconciliation between climate change science and literature to convey and transmit scientific information through environmental literary narratives in order to create real debates to help solving the problem of climate change. He writes, "If environmental literature is to be heard not as a booming echo or as high pitched whine, is not to be viewed as the grave concern of a few, but listened to, analyzed, and acted upon by many, it must be rooted in scientific fact and developed with a narrative structure that is meaningful to not just some, but to all" (113). Such a message is carried out in the selected novels of this study, namely, Ian McEwan's *Solar;* Marcel Theroux's *Far North;* Margaret Atwood's *Oryx and Crake*; and Sarah Hall's *The Carhullan Army.* Through the analysis of their narratives, the present study aims to show how these writers develop their narrative structures through scientific facts. In other words, how do they present a scientific fact like climate change in their novels?

The choice of these specific novels was based first on dealing with various visions about climate change. Each novel among them has its own outlook about climate change. Each writer in these novels gives a different representation of climate

change that helps to differentiate between the developments that occurred in the field of science fiction. Therefore, what is innovative in this research first is its flexibility to be connected with up-to-date changes, especially, with the appearance of Covid-19 that gives room to re-read Atwood's *Oryx and Crake.* Second, this research helps to differentiate between genre, science fiction, and subgenre in science fiction. It also tries to answer questions like: How do science fiction writers react towards global issues as climate change and environmental degradation? And what can the up-to-date challenges offer to science fiction?

According to Andrew Milner, "Genre is an aspect of the more general phenomenon of cultural form', traditionally subject to distinctly 'formalist' modes of analysis preoccupied with systems of formal classification" (23). Milner declares that John Rieder establishes a clear distinction between "'the pre-existing classical and academic genre system that includes the epic, tragedy, comedy, satire, romance, the lyric' and the emergence during the nineteenth century of 'a genre system associated with mass publication that came to include science fiction ... the detective story, the modern romance, the Western, horror, fantasy, and other similar genres' (Milner 23).

The answers to these questions help to divide the different parts, chapters and sub-sections of the research work. Accordingly, my dissertation is divided into two parts, a theoretical part and a practical one. The first part is divided into two chapters named as follows: "An Overview of Environmental Literature," and "Origins and

Developments of Ecocriticism and Ecofeminism." The aim of this part is to identify notions linked with the 'climate novel'; its origins, developments, and devices. The first chapter deals with a theoretical delineation and a historical background of environmental British literature and a historical survey of climate change fiction. The second chapter is devoted to the study of the theories used in the analysis of the selected novels, ecocriticism and ecofeminism; it deals with a historical background of Ecocriticism and Ecofeminism and investigates the different ecocritical theoretical tenets. Also, it deals with the fictional representations given to climate change and environmental degradation and the emergence of the British climate change novel

The second part is an ecocritical analysis of the four selected novels. It is divided into three chapters: "An Ecocritical Analysis of Ian McEwan's *Solar* and Marcel Theroux's *Far North*," "Ecocriticism versus Ecofeminism," and "The Effect of Climate Change on the Language of the Selected Novels." The first chapter discusses Ian McEwan's *Solar* and the scientist's personal dilemma in this anticipatory climate change novel and social collapse in Marcel Theroux's *Far North.* The second chapter focuses on the forecasting of the Novel Coronavirus and human extinction in Margaret Atwood's *Oryx and Crake* and the Anthropocene as flooding in Sarah Hall's *The Carhullan Army while* the last chapter deals with the rhetoric language in Ian McEwan's *Solar* and language erosion in Margaret Atwood's *Oryx and Crake,* Marcel Theroux's *Far North* and Sara Hall's *The Carhullan Army.* The aim of this part is to

try and find answers to the different questions raised in this research through a practical study of the selected novels.

Studies have shown that the term ‘science fiction’ has become the suitable term to name a particular mode of writing identified as the ‘literature of change,’ which concerns itself to analyze optimistically or pessimistically the different alterations happening in society, including, nature, science, and technology and all aspects of the human life. Literary critics have classified science fiction works into different categories or subgenres: hard science fiction, soft and social science fiction, cyberpunk, time travel, alternate history, military science fiction, superhuman, apocalyptic, space opera, space western, feminist science fiction, new wave, steampunk and comic science fiction. However, the beginning of the new century witnessed a new category which took climate change as its major theme, and all the stories that were linked to it. The novels that fell under this category of fiction were named 'climate change novels', as a new subgenre in science fiction. Today, climate change has conquered the literary imagination and defends itself to be classified under the umbrella of climate change fiction as a subgenre in science fiction. Therefore, climate fiction has become one of the most urgent topics of many contemporary fiction writers who are aware about its dangerous consequences on the whole world. Thus, the discussion about climate change in this research will center on the tendency of the way fiction can help to raise environmental awareness and change human beings anthropocentric conceptions of Earth, and this will be done through analyzing the

various representations of climate change in the four selected novels. Through the analysis of the multiple efforts made by the writers under study to reconcile between ecology and literary imagination, this work will try to show how literature might offer practical contributions to raise global awareness to defeat climate change.

PART ONE

CLIMATE CHANGE IN LITERARY IMAGINATION AND LITERARY THEORY

Introduction

Many voices have called for classifying climate fiction as a literary genre that should stand by itself, however, it is still considered as a subgenre of science fiction. A survey of its historical roots requires going back to the tradition of science fiction, the raise of science and the emergence of the Industrial Revolution, when the first seeds of the environmental crisis, that the world is experiencing today, started to appear. With the advancement of science and technology, human greed has grown and caused significant damage to Earth's geology and ecosystems. This has led; therefore, to the emergence of environmental literature or as it was labeled before nature writing. Though nature writing focused on nature or the natural world and included both fiction and non-fiction, environmental literature concerns itself only with literary texts and moves towards representing the contemporary environmental crisis. Therefore, the aim of this part is to provide a wide overview of environmental literature, climate change fiction, and ecocriticism, emphasising on British literature.

Chapter One: An Overview of Environmental Literature

The Industrial Revolution had a profound impact on environment. The various alterations that the British society witnessed, transforming from a rural agricultural society to an urban industrial one, brought with them new tendencies and concerns to British literature where British authors tried to reflect on its multiple negative effects on people's life and environment. Indeed, the rise of environmental British literature was due to the rise of modern capitalism with its fundamental associations: enlightenment thinking, Newtonian science and the Industrial Revolution. Therefore, such three rising connotations were considered as a point of change in literature in general and British fiction in particular. With the growth of the Industrial Revolution and industrial societies, literature started to talk about industrialization as a 'disturbed nature-society relationship' (Kutting 34). Overtime, this gradually led to global environmental degradation, especially after the rise of the fossil fuel economy and the development of communication and transport between the different parts of the world. Thus, the aim of this chapter is to provide a wide overview of environmental British literature, seeking to investigate both the theoretical basis behind this type of writing and the various representations of environmental degradation in British literature throughout history, starting from the Industrial Revolution to the rise of climate change fiction.

I- Theoretical Delineation of Environmental Literature

This study is devoted entirely to study British environmental literature in general and the British environmental novel in particular. Thus, the aim of this theoretical

foundation is to provide a definition to the genre in an attempt to assess its emergence in England, illustrating its characteristics and surveying the development of its themes. To start with, reactions to the natural world and its degradation strongly reshaped British literature, especially, after the rise of industry and science, and writing about them is the first step towards the emergence of British environmental literature. The growth of colonialism and imperialism, specifically, during the Industrial Revolution in the second half of the 18th century and the invention of the steam engine, helped a lot in the transformation of the nature-people relationships, and people started to exploit the natural resources to get more wealth. As a result, this exploitation led to an ecological transition that "has largely, although by no means exclusively, followed upon the spread of a European capitalist system over the globe with the corresponding penetration of a Western economic process beyond as well as within the colonial context" (Grove 15). Thus, due to this intensified economic activity, the era between the last decade of the nineteenth and the 1960s witnessed an unprecedented scale of human exploitation of the natural world that caused widespread environmental degradation.

Davood Mohammadi Moghadam et al (2015) highlight the impact of the Industrial Revolution on the British society. According to them, the economic transition from pastoral life to an industrial one caused cultural, social, political, and most notably environmental devastating consequences. Though this mechanical revolution improved and facilitated the life of the majority of people at the time, it also harmed nature. In this sense, they assert that the Industry Revolution gave birth to an industrial society that

negatively affected the wildlife, nature, and all what constituted the natural beauty,

> By the black hands of industrial revolution most of the rural areas have been urbanized. After industrial revolution, everything surrounding human being was human-made; buildings, railways, roads, cars, ...take human away from nature. Technological and industrial advances like TV, telephone, mobile, computer, and internet have made human busy with facilities so his/her intimate relationship with nature was forgotten. And as was mentioned, postmodernity also put woods in the fire of human alienation from nature. (91)

According to them, the Industrial Revolution alienated people from nature. The British society, whose life depended completely on agriculture and pastoral life was forced to move to cities with the introduction of machinery shifting; as a consequence, from rural manual work to a mechanical, technologically advanced one, in factories based on coal steam engines. Because of the rise of factories, people migrated to metropolitan areas looking for better conditions, leaving behind them rural life and nature's beauty. Pollution became a widespread factor caused by the wastes of houses, mines, and factories; water and air were poisoned, population increased and people consumed more natural resources, which started to deplete. Most areas were urbanized leading to a shrink of the rural areas and caused the loss of the wildlife because forests were cut down to expand cities and provide lumber for construction. The Industrial Revolution led to technological advancements that encouraged a new cosmopolitan in lifestyle; daily life, transportation, and communication prospered. Life also became easier and faster giving no time for people to be interested in nature. Davood Mohammadi Moghadam et al conclude their essay by stating that people’s alienation from nature became even bigger with the postmodern industrial changes, and the rise of digital technology.

In the same context, Jennifer McClinton-Temple explains in *Encyclopedia of Themes in Literature* (2011) how the Industrial Revolution created alienated workers, who were working under dangerous circumstances for long hours to produce more, and who were traumatized from machines; these workers were living in a different atmosphere. Before the Industrial Revolution, they were working under different norms and different settings; labor was often accomplished in a family setting with a feeling of pride and satisfaction. McClinton-Temple links the alienation of people to three main causes. The first cause was their manipulation as machines. She maintains that workers "were alienated from their own essential humanity, because they were treated as 'machines' as opposed to human beings" (5). The second cause she refers to is the limitation of social relationships of people because of their enslavement by the machines: "Further, they [were] alienated from one another because there [was] no social relationship involved in the production of a commodity" (5). The third cause [was] their alienation from the product they produced. She writes, "They [were] also alienated from the product they [were] producing, because it [would0 be sold on the market with no relationship to the human that produced[ed] it, and from the act of work itself, because there [was] no satisfaction or meeting of desire involved" (5).

Thus, environmental degradation, urbanization, and workers' alienation at that time inspired many writers to talk about the impact of the Industrial Revolution that occurred during the Romantic Period. However, the question, worth asking now, is how did

Romantic writers develop narratives to cope with the new realities of the British society, the homeland of the Industrial Revolution?

Romantic writers were skeptical about the spread and use of science and rejected Enlightenment that favored reason and rationality. They were also against the scientific rationalization of nature. Thus, with the emergence of the Industrial Revolution, they opposed its negative aftermaths on environment. They used imagination and emotions in their literary works as a response to the disappearance of the pastoral life they were so fond of, and the emergence of urban and industrial areas. The major themes they raised to celebrate nature were chaos, natural beauty, and idealization of the rural life. They adored the spirit nature and considered nature and God were one and the same, perceiving nature as a metaphor for the sublime.

Romantic poetry too witnessed drastic changes in terms of themes and forms as responding to the Industrial Revolution. New changes brought by the Industrial Revolution on the British rural areas, such as pollution, urbanization, and child labor, inspired many poets to write about the new standards of the industrial society; among them were John Keats, William Blake, William Wordsworth, and Percy Shelly. William Blake's poem, "The Chimney Sweeper," for example, criticizes the abuse of children in factories and mines while William Wordsworth and Coleridge's *Lyrical Ballads* criticize urbanization and the pollution of nature.

These literary responses to the negative environmental impact of the Industry Revolution on British pastoral life were considered as the point of departure in British environmental literature. So what is environmental literature? And what are the main features that may distinguish it from the other literary genres?

Because of its associations with the other literary genres, environmental literature is not easy to define. Despite the fact of being an old genre, it gained its significant popularity just after the Second World War, when humanity started a new geological era, the Anthropocene (Bigell 12). Contemporarily, environmental literature is defined as a distinct literary genre, a category in the branch of ecofiction literature, which has roots in classic, pastoral, magical realism, animal metamorphoses, science fiction, and other genres. Jim Dwyer in his book, *Where the Wild Books Are: A Field Guide to Ecofiction*, (2010) states: "The terms 'environmental fiction,' 'green fiction,' and 'nature-oriented fiction,' are sometimes used interchangeably with 'ecofiction', but might better be considered as categories of ecofiction" (3). To illustrate more, he continues clarifying what is meant by 'ecofiction,' a term, which became popular only in the 1970s when a number of environmental movements shaped the stage for an explosion of environmental literature. He writes that ecofiction "deals with environmental issues or the relation between humanity and the physical environment, that contrasts traditional and industrial cosmologies, or in which nature or the land has a prominent role" (2). He adds that it is made up of many styles, primarily modernism, postmodernism, realism, and magical realism, and that it can be found in many genres, primarily mainstream, westerns, mystery,

romance, and speculative fiction including science fiction and fantasy (3).

Environmental literature is distinguished from the other literary genres with what Robert Finch and John Elder consider “a high degree of attentiveness towards the natural world” (Quoted in Kjeldaas 23), where “an intense and self-conscious awareness of nature” (Quoted in Kjeldaas 9) is raised, and people’s exploiting treatment of nature has become “as a subject of enquiry and thus engender environmental awareness amongst readers” (Ryan 2). Broadly speaking, four major traits characterize environmental literature: it combines aesthetic and spiritual sensitivities with scientific observation and knowledge, focuses on both; nature and the human relationship with nature, includes an ethical dimension, and involves a political dimension (Quoted in Kjeldaas 1-2).

In general, environmental literature is the result of nature writing, a type of writing that started with Henry David Thoreau’s *Walden* (1854). Thoreau, Abbey, Emerson, and others, have greatly influenced the contemporary ecological thought. However, contemporarily, the term ‘nature’ has been replaced by another term, ‘environment,’ which was first coined by Thomas Carlyle in 1828 because the term ‘environment’, as Kadri Turn explains in his thesis, 'Semiotics of Nature Representations: On the Example of Nature Writing' (2017), "sounds more like a technical term that is familiar to us from natural sciences - it is observable, measurable, calculable, and graspable by means of rational thought” (Turn 15).

Nature writing refers to all that is written about the natural environment, including nonfiction, fiction prose and poetry. Commonly, the object of these writings is nature and includes an array of works whose emphasis varies from natural history facts to predominating philosophical interpretations. Commonly, it has drawn heavily from scientific information and facts about the natural world. Moreover, it is often written in the first person, incorporating both personal observations and philosophical reflections about nature. In his book, *Writing about Nature: A Creative Guide*, John Murray defines the nature writing tradition in Western literature as "All literary works which take nature as a theme" (Quoted in Ryan 2).

In America, nature writing began with the Spanish, French, Dutch, and English adventurers who explored the New World during the fifteenth and sixteenth centuries and were captivated by its beauty and charm. Then, during the seventeenth century, it moved to reflect the preoccupations of the colonial settlers who began to make their homes there. Eighteenth -century American writing began to show rationalist and scientific approaches common to the modern form of the genre, satisfying, accordingly, the readers' appetite for landscape aesthetics, emphasizing the ennobling power of nature.

In Britain, a different tradition of nature writing- less spiritual, and more concerned with natural history, existed. It started with John Clare's poems and Gilbert White's prose. White; for instance, is considered as the first ecologist in England and one among those pioneers who shaped the modern attitude of respect for nature. In his best known book,

Natural History and Antiquities of Selborne (1789), he gathered with William Markwick records of the dates of the emergence of more than 400 plant and animal species in Hampshire and Sussex. Later, a group of British nature writers, such as, Robert Macfarlane, Richard Mabey, Tim Robinson, Roger Deakin, Mark Cocker, Oliver Rackham and Alice Oswald, turned their attention towards complex questions concerning weather, climate change, and environmental degradation due to the severe situation of the Globe.

During the last two decades, the United Kingdom has witnessed an unusual rebirth of landscape writing as a response to the harm done to nature and the growing awareness about environmental crisis known as 'The New Nature Writing,' 'literature of landscape,' 'place-writing,' or 'nature literature.' This is well illustrated by Ricardo Pereira da Silva in "Terra Incognita: Literary Maps and Nature Representations in Jon Krakauer's into theWild." He utters,

> The most recent resurgence of Romantic thinking could be viewed as a response to globalization and the environmental crisis. Globalization has stirred up a variety of social movements and political activism, as has the environmental crisis; however, as our understanding or ways of seeing the world change, so must our understanding of literature and the use of language that reflects that world. (Pereira da Silva 66)

Pereira da Silva emphasizes a very important notion, which is the importance of language as the main medium used to represent and reflect humans' understanding of the surrounded world. He contends it is through language that the writers of the Romantic Age founded the first seeds of environmental awareness that were rooted in Romantic literature

of the eighteenth century. At that time, as a response to the new challenges that the pastoral British society witnessed, writers felt the need for new narratives to represent the severe polluted condition of the natural world. In their works, nature was no longer the source of sublime; it became stained by the urban crowded cities, poisoned waters and rivers, unclean air, and dark smokes. And it was through language that they succeeded to reflect such new condition of industrialized Britain's realities. A whole chapter will be devoted to the study of the language used by Ian McEwan, Marcel Theroux, Margret Atwood, and Sara Hall and shed light on their understanding of climate change and environmental degradation.

It is crucial to investigate the way writers manipulate environmental issues, how they raise environmental awareness in their literary works, and under which umbrella critics classify such works. Before the appearance of environmental literature as a category in ecofiction, environmental issues were discussed under other genres as science fiction. In *The Routledge Companion to Science Fiction*, Patrick D. Murphy in his article, "*Environmentalism*," confirms that nature considerations with detailed depictions have always been substantial in science fiction, and this has led to the appearance of a considerable body of environmental and ecological science fiction (Murphy 380). Murphy presents illustrated details about the emergence of environmental literature. He considers that science fiction is 'pro-nature' because a great number of science fiction writers have an environmentalist orientation and raise environmental awareness through answering two

ubiquitous questions about what nature is, and what a human being is. In this regard, he assumes that earlier science fiction novels, such as, Mary Shelley's, William Dean Howells', Jules Verne's, and Nathaniel Hawthorne's short stories demonstrate a proto-environmentalist awareness that encouraged readers not only to think about such issues but to act as well.

For Murphy, discussing the emergence of environmental literature requires discussing the emergence of environmentalism, "a philosophy or behavioral orientation" (375). In literary production, three different types of environmentalism are developed: nature-oriented literature, environmental writing, and ecological writing. Nature-oriented literature is the literature where "the literary work draws attention to particular aspects of a natural world which need not exist in the reality we know, but may be a thought-experiment" (Murphy 375). The writer, in this literature, describes numerous natural elements that often play just a minor role in the plot.

The second type, which is environmental writing, is also called environmental justice writing. Murphy assumes that in this type of science fiction, "authors move beyond local color to make some kind of threat to an ecology or planet the key to the plot and the response to it a major theme" (Murphy 375). This type flourished during the 1950s, focusing on the sudden natural imbalance that threatens human existence. This literature portrays environmental dangers of nuclear power and unsupervised biological and chemical experimentation that disturb natural processes and produce monstrous creatures

and geological threats. Environmentalism's third form, ecological writing, is also known as political writing because it wants, predicts, and demonstrates a change in human social behavior. Its plots motivate readers to the point of taking radical decisions. It also attempts at being "systemic in scope, laying out an entire planet's biospheric activity, or educating readers about the interdependence of natural phenomena" (Murphy 375). Furthermore, it has a bias towards asking ethical and philosophical questions about humanity's potential.

In the same article, Murphy raises another crucial issue, which is to border the limits between 'nature,' 'environment,' and 'ecology.' To do so, he starts by elaborating a definition for each concept separately from the others. He defines nature as "the non-artificial or non-manufactured, material reality that provides the setting for a work of science fiction. It should not be perceived as external to the characters, since their natural physical makeup constitutes part of the non-artificial reality of the story" (373). He also acknowledges that non-artificial nature should not be perceived as external or in opposition to culture and technology that are designed and manufactured with and on the basis of nature. Concerning the environment, he expresses,

> much sf is set in manufactured environments and some in natural environments, including the human body. The environment consists of the surroundings with and within which characters interact, but they themselves are usually represented as existing apart from that environment. Sometimes this environment becomes a nonhuman or non-individuated sentient character, such as the sentience-evolved planet in John Brunner's *The Dramaturges of Yan* (1972)...but generally it remains a backdrop. (374)

Accordingly, Murphy limits the definition of environment to the setting surrounding

characters, a local that includes the natural, the cultural, and the artificial. On the other hand, he defines ecology as "the scientific study of the interaction of organisms with their environment, including the physical environment and other organisms living in it" (374). He goes further in his definition by stating that ecology is "a natural system that undergoes, or can undergo both autodynamic change and externally induced change and encompasses multiple interactive environments (local ecosystems). This system includes actants considered to have agency, in the sense that we usually reserve for human beings" (374).

In northern Europe, three main themes occupy environmental writers' imagination: pollution and industrialization's costs, forests' history, and agroecosystem. Having a strong historical geography tradition, the majority of these writers were geographers; this includes British writers who "have the most extensive literatures now" (Mcneil 19). These historian writers, such as, T.C. Smout; the author of *Nature Contested: Environmental History in Scotland and Northern England since 1600,* were interested in pollution issues during the 1980s. Later, many of them turned to other topics. Until the 1990s, European environmental history or European environmentalism dealt with the energy base of Agrarian society and the transformations of industrialization, so the interest shifted from land to environment and from local to global (Mcneil 19).

The second focus of New Environmentalism was a radical political critique. A more

sweeping critique of government and society was developed. With the publication of Rachael Carson's novel, *Silent Spring* (1962), environmental awareness was raised about chemical industry, and the direct relationships between environmental and societal issues were greatly recognized. Thus, nature writers and philosophers looked to radical political theories, such as, anarchism, socialism, and ecofeminism, to assess environmental problems ("The 'New Environmentalism' of the 1960s" 1).

The third focus was on studying other cultures, such as, Buddhist and Native American culture, as sources for a new worldview while the fourth focus was on the raise of a new society. In this respect, nature writers and environmental philosophers started to think about alternative social structures; they moved beyond what they called 'a destructive and alienating society' in order to apply ecocritical worldviews at a societal level. The sources they used to build up this ideal society were numerous. They were based on their familiarity with other cultures (Buddhism and Native Americanism), earlier American culture (Wendell Berry and the Jeffersonian ideal of a country of farmers), a radical political theory; principally, Western anarchist and utopian traditions, alternative societies found in Transcendentalism, or Thoreau's vision of a social and political ideal, which was completely different from the conventional society. Subsequently, other environmental concerns like climate change, the unsustainability of resource withdrawal, deforestation effects, and industrial wastes on local fauna have appeared as results of the new consumer culture.

In short, contemporary environmental literature's major concern is to describe ecological issues of the contemporary world, mainly, climate change and environmental degradation. Often, it offers recommendations about how one ought to respond to such new knowledge by preventing extra destruction of the Earth's ecosystems and maintaining an inhabitable environment. In doing so, it struggles to introduce an ecocentric perspective in its readers' minds. Feeling a direct responsibility to think and act towards one's natural environment is an urgent call for all environmental writers whose major objective is to start caring for nature. The absence of nature signs the absence of human being himself.

II. Environmental British Literature

The environmental impact of the Industrial Revolution on the British pastoral society inspired many writers to react and represent the natural environment and its degradation in their literary works. Through their works, they revealed that literature was a very useful tool to express and discuss the nature of the relationship between human beings and their environment, which was changing from a harmonized and sympathetic view in the Romantic era towards a harsh and merciless one during the industrial capitalistic time. Since the aim of this study is to analyze the contemporary representations of climate change and environmental degradation in Ian McEwan's *Solar,* Marcel Theroux's *Far North,* Margaret Atwood's *Oryx and Crake*, and Sarah Hall's *The Carhullan Army*, and show how such representations may help to raise global awareness about the planetary-human survival among readers, this historical account will help

understand the origins of ecocritical awareness and its main characteristics. In fact, and as we will see in more details later, there was awareness of the blessings and sublimity of nature during the Romantic period. Years later in the Victorian period, this awareness developed to become a warning against the danger that nature might cause in the life of a human being; whereas, recently, nature has shifted towards considering it as a symbol to comprehend and evaluate the human and non-human lives.

The analysis of British environmental literature reveals that Romantic nature poetry played an important role in the emergence of this literary genre. Writers of the time gave different meanings to nature in their writings; nature as a refuge, nature as a source of inspiration and freedom, and nature as a source of emotion. Through time, these meanings changed within the cultural contexts that shaped the British society and led to the appearance of new themes in environmental British literature. After considering it as a source of worship and spirituality, the appearance of new sciences during the Renaissance helped to view the non-human world from a scientific point of view, and writers started to change their attitudes towards it. In this context, S. Greenwood in his book, *The Nature of Magic: An Anthropology of Consciousness*, tries to summarize the different treatments given to nature and argues that nature has four main discourses that have emerged throughout history. He demonstrates: "Nature valued as a science, seen in objective and abstract terms, nature valued as an economic resource for productive wealth, nature valued as a source of emotional identification," and "nature valued as a mystical spirit worthy of

reverence and awe''(Quoted in Denise 37).

Greenwood's four discourses of nature are the representatives of the four literary periods, the Renaissance era, the Romantic period, the Victorian age, and the contemporary times. All these discourses are the result of the new sociocultural thinking, and this evolution in attitudes towards nature in British literature has been affected by the evolution of Capitalism, which has been a central theme in the writings of many British writers, such as, Thomas More, William Shakespeare, Charles Dickens and George Orwell. Contrary to the American writers, the British writers assume that Capitalism with its new discourses has negatively impacted the British society as well as the British natural environment. Therefore, they have tried to show and intensify the impact of the new technologies, the use and misuse of the natural resources, and the responsibilities of the human beings on their environment (Stanwick 1).

The first discourse of nature started to appear in the Renaissance era. In that period, scholars manipulated nature objectively and intellectually. They considered it as a science. Copernicus, Bruno, Telesio, Francis Bacon, Kapler, and Galileo, started to study nature as a physical power that causes the material world's phenomena. They acknowledged that the external world contains two elements, motion and orderliness, rejecting totally the Greek view, which avows that nature is the essence of things that dictates their behaviour: "nature was alive and rational" (Reddy 40). These thinkers together established "the

mechanistic philosophy for studying the physical realm, namely that all physical entities (including living organisms) were analogous to machines, and as such, scientists should explain their behavior strictly in terms of mechanical interactions among their parts" (M. Howe 398).

This scientific view of nature was applied in a number of literary works, written by a variety of British writers, such as, William Shakespeare, John Milton, and John Donne. William Shakespeare was very significant and had a big impact on British Romanticism. He mostly centered nature in his art in order to reflect on all "chaotic and confused reality" (Grundmann 30). For him, the "mixture of the grotesque and sublime, high and low, comic and tragic was seen as a realistic and truthful depiction of the panorama of the world" (Grundmann 30). For example, in his play *King Lear* (1603), there is an impression that man's struggle is mainly with natural forces. The other prominent figure, John Milton, demonstrates another type of conflict. For him, the human conflict is set between the ancient and recent values. Accordingly, in *Paradise Lost* (1667), he raises a very important conflict issue between the scientific findings of the time and the old astronomical systems. The other notable figure, John Donne, did the same. In his work, he tried to set out a conflict between two main poles, the ancient physics and metaphysics and Galileo's and Bacon's recent science (Reddy 40).

Actually, all such new scientific ideas about nature set the stage for the establishment of a new type of writing, which is environmental literature. The latter appeared in the late eighteenth century and early nineteenth century where society started

a new industrial era, and the meaning of nature changed among writers. Indeed, during the early and mid-eighteenth century, the second discourse of nature started to emerge in literature as a revolution against the surrounding circumstances, a period in which writers tried to reconcile between the Romantic ideals and the scientific findings. During those years, the British society witnessed big changes almost in all fields of life. However, the multiple forces brought by this new discourse of nature started to threaten nature as an unending exploiting economic source "to realize human progress" (Ho 894), and writers' vision was to defend it. This view was well stated by Jean Jacques Rousseau who believed that nature's "peace and harmony" were "destroyed by the historical development of human society" (Lokke 139). Ricardo Pereira da Silva states in his article, "Terra Incognita: Literary Maps and Nature Representations in Jon Krakauer's Into the Wild,

> In reaction to industrialization, the Romantic Movement favoured Jean Jacques Rousseau's concept of nature, one still removed from man's touch. From this statement, it is obvious that nature, in opposition to man, the culture maker, is more desirable because of its apparent ability to provide transcendence, inspiration and freedom. (66-7)

The Romantic writers were against the industrial urbanization with its new cultural standards and prioritized nature, following Jean Jacques Rousseau's view, which was considered as a source of peace and harmony. For them nature was a source of transcendence, inspiration and freedom.

Romantic writers believed mainly in the genuine power of imagination and considered nature as a refuge or the only source for their aspiration. They thought "poetry could change the world" (Kovesi 8). Therefore, under John Jack Rousseau's influence, addressing 'back to nature,' they focused on examining nature as the universal truth, and

based their imagination around two main poles, Aesthetics and the Sublime. Through Aesthetics, they reconciled between the beauty of art and nature; whereas, through the Sublime they talked about the unseen, which was often realities about the nature of the relationship between human beings and their natural environment. According to them, nature should be celebrated because it is "a means of reconnecting with the self" (Pereira da Silva 65). Thus, they glorified and manipulated the non-human world from a very caring view and started to talk about it with ecocritical awareness as a reaction to industrialization. In their article, "By the Name of Nature But against Nature: An Ecological Study of Joseph Conrad's *Heart of Darkness*," Mahdi Bakhtiari Hojjat and Esmaeil Najar Daronkolae explain,

> Ecocritical awareness of the non-human world begins not with the environmental revolution of the 1960s and 1970s, but with a new definition of nature first offered by Romantic writers in the late eighteenth and early nineteenth centuries. This shift eventually brought a new emphasis on connections between nature and society. The Romantic movement was an artistic and intellectual one, commonly expressed in literature. But it was not just a set of ideas, unrelated to what was happening in the world. It was clearly a reaction against material changes in society, which accompanied emerging and expanding industrial capitalism in the 18th century.
> (3)

Hojjat and Daronkolae talk in the above passage about the emergence of ecocritical awareness. They claim that ecocritical awareness is not a new phenomenon in the literary world; they do not even relate it to the appearance of the environmental revolution of the 1960s and 1970s, which started with Rachael Carson's novel, *The Silent Spring.* Rather, they emphasize that ecocritical awareness started with Romantic ecocitical thinking, which refused industrialization and preferred nature, showing that Romantic writers started at

that time criticizing the new material culture that the British society had adopted. In the same context, these two writers, Hojjat and Daronkolae, continue to demonstrate that modern ecocriticism has been nourished by romantic writers' thoughts. Consequently, its contemporary ecological language and beliefs still preserve romantic, artistic and philosophical practices and theories (3).

Certainly, Romanticism helped a lot to identify the first seeds of British environmental literature. William Wordsworth, Samuel Taylor Coleridge, and William Blake played an important role in addressing nature in their writings and had greatly influenced other poets of the second generation, such as, Thomas Gray, Lord Byron, P. B. Shelley, and John Keats. Though Romantic poets of the second generation were influenced by the previous generation, they rebelled against them, and each one of them established his own devices and looked for other presentations of nature in his work. They wanted "to stress the uniqueness of each individual 'self and its corresponding power to fathom all reality by a uniquely authoritative vision or intuition" (Henry 10). However, the various delineations given to nature in that period were religious, emphasizing the beauty and love of nature as an Eden and on the multiple feelings that might be evoked in its viewer in order to seek "unity and fresh relationships with nature" (Kjeldaas 245). This view is well clarified by Tawahid Shams Chowdhury in *Thomas Hardy & Romantic Tradition*. According to him, "Sublimity of untamed nature is a trademark facture in Romanticism. Nature meant many things to the Romantics. It often presented itself as a work of art,

constructed by a divine imagination and especially in emblematic language" (5).

The adoring Romantic nature practitioner who contributed to establish an environmental literature tradition is the poet, William Wordsworth. Wordsworth loved nature, and his significant ability to allure ordinary things had helped him to design the surrounding environment he was living in, and give real pictures of the human influence on nature at that time. His literary work is built on the assumption that literature or poetry should be interpreted "as a 'representation' medium in terms of satisfying man's needs, shaping and enlarging his moral vision. The idea of literature either as a craftsmanship or outburst of feelings is but a vehicle for both 'delighting and instructing' man" (Marangoz 211). In other words, through his poetry, Wordsworth delights the reader in order to instruct or teach him a lesson about both, the beauty of nature and its love. Specifically, he mostly focused on wild nature as the background of his poems, using a language of "a simple farmer" (Thomley et al 91) to create a communal atmosphere between nature and the human self while prior to his work, poetry "had been orderly and polished, without much feeling for nature" (Thomley et al 91).

Wordsworth and Samuel Taylor Coleridge founded together innovative ways to respond to the natural environment. In their shared work, the *Lyrical Ballads* (1798), which is considered as the starting point of Romanticism and a basis stone for environmental writings, they showed their love for nature through the depiction of their

environment, especially, the lake region in the north-west of England where they lived. Depending on the language of ordinary life, and using a lot of natural imagery drawn from direct individual observations are some of the most typical characteristics of their work. James C. McKusick states in his article, “Nature” that for Coleridge, "the ‘poetry of nature’ emerge[d] from two main sources: fidelity to the ‘truth of nature,’ and the ‘modifying colours of imagination’ ” (423).

Following is the age of John Dryden, Alexander Pope, and Isaac Newton. During that era and with Newton’s theory and Dryden’s and Pope’s writings, environmental literature witnessed another sort of innovation. Both Dryden and Pope focused on showing natural scenes that were touched by the human cultivation. Particularly, they preferred depicting landscapes with rising smokes and cultivating fields but such writings actually did not reflect serious intentions towards nature since these writers were living in the city. Therefore, at that time, this type of writings was decorative only, characterized by “mechanical love for nature dryly displayed through prosaic words only” (Reddy 41).

The Victorian Age was a very remarkable period in the history of English literature and specifically on environmental writings. At that age, there was a shift from a rural owning lands' economy towards a modern urban trading and manufacturing one. In addition, new issues appeared in the British society, such as, workers’ migration towards the urban areas to live near the factories where they worked, the extension of franchise

democratization, religious challenges, scientific advances, and women's new roles. All this informed the Victorian literature, and writers turned towards a new vision of nature. For them, nature was a source of danger, and they invited their reader to examine his lives and their inner feelings in relation with the natural environment that surrounds them.

On the one hand, the Victorian writers imitated all the earlier Romantic concepts of nature; particularly, those of William Wordsworth, and tried to center nature in their writings in the same way as the Romantic writers. According to Claire McKechnie et al, nature is no longer marginalized; rather, it is placed in the center of their writings as a response to the scientific thinking of the era. They state "Traditionally, literary studies of nature in the nineteenth century have tended to focus on the Romantic period" because "Romanticism as a movement towards the construction of scientific thinking in literature has led to the placement of nature and the natural world at the center of how we think about the Romantic imagination" (McKechnie et al 1). Moreover, the scientific progress that took place at the time played a big role in educating and communicating knowledge about the natural environment and the various human activities towards it. On the other hand, the Victorian writers adopted the new scientific advancement of the era, and Charles Darwin's *Origin of Species* theory in their writings. As a result, individualism over dominated nature, and human beings were able to exploit it in many ways. In other words, these writers attempted to reveal in their works that there is an open conflict between man and nature because the chief aim of the human being is to satisfy his needs over nature.

Charles Dickens is among the most prominent Victorian writers, who offered a distinctive model of the Romantic view against the Industrial Revolution and modern capitalism. In his novel, *Hard Times* (1854), for example, he criticized widely and overtly the industrial society and the aftermaths of the Industrial Revolution on both individuals and nature. Robert Browning was another important figure who helped to trace nature writings. He was influenced a lot by the Romantic nature poetry in terms of using real landscapes as background for thought and emotion, especially those of Wordsworth and Keats. He was sympathized by the close relationship between nature and man. The other prominent figure who depicted nature in his work is the poet and novelist Thomas Hardy. Hardy is considered as the greatest Romantic Victorian writer. In his fiction, he wrote on the province of Wessex; whereas, in his poetry, he turned to nature and focused a lot on natural transformations to raise awareness in society about the old and the current situations of nature. Claire McKechnie et al point out, "Writers like Hardy [...] negotiated this ambivalence between progress and tradition, between the permanency of natural features of the landscape and their ongoing transformation." (2) Through this statement, , McKechnie et al. stress the role played by Romantic writers as Hardy and the technique used to raise awareness about the severe situation of the natural environmental caused by the industry by portraying the natural world between the old harmony days and the current industrial days.

G. M. Hopkins was another important writer that best defined this type of writing at

that period, but he differs from the common Victorian approach towards nature. For him, nature was created to serve God, and higher realities should be presented through nature, which is the reflection of God's benevolence and beauty. Thus, in his poems as "Pied Beauty," "Spring," "God's Grandeur," he depicted nature as a symbol of the beauty of God's plan. The other prominent figure was Edward Thomas, who was considered as the most significant nature poet among the Victorians. He had a strong sensibility in his attitude towards pastoral themes. In his work, nature is not mentioned as a mere objective; rather, it is wedded with his sincere mood and emotions. The writings of all such writers were regarded as bridges between both the Victorian and Modernist environmental writings, and the efforts that were made by each writer were considered as a pace in the development of environmental literature.

The Modern Age carried another fortune to nature and environmental literature in general. In that period, nature was treated in a 'passive manner' (Reddy 44), and it was appreciated as a supernatural spirit of admiration and wonder, raising a number of questions about how people perceived the environment in an age of highly scientific establishments with their newly environmental problems. Modernists' views towards it are completely different from those of the Romantics' or the Victorians'. They were not interested in the shortcomings of the Industrial Revolution nor in defending or loving nature for its sake. Furthermore, they were uncertain in their attitude towards the Victorian writings. Therefore, they attempted to distance themselves from them and look for other

narrative strategies and thoughts about the natural world discourse. This was due to the new discoveries in natural sciences, including even those improvements of the Darwinian biological theory and its implications. Through their writings, they revealed that the existence of nature is very important in the life of human and non-human organisms and acknowledged the fact that for a human being, the absence of nature means the absence of his culture. For Tim Ingold, a professor of Social Anthropology,

> The environments of human beings, therefore, are culturally constituted. And when we refer to an environment - or more specifically to that part of it consisting of animate and inanimate things - as 'nature', then this too has to be understood as an artefact of cultural construction. 'Nature is to culture', writes Marshall Sahlins, 'as the constituted is to the constituting' (1976: 209). Culture provides the building plan, nature is the building. (Ingold 41)

Because of the impact that culture may have on the construction of nature in the modern times, the definition of nature has changed. Ingold transcends its definition from all what is natural to include even the buildings of human beings; nature, then, becomes a human-made phenomenon, and all what surround human beings become parts of nature.

Among the Modernist writers who dominated and left a full print on environmental writings at that time were T. S. Eliot, W. H. Auden, and W. B. Yeats. T.S. Eliot was the first to pioneer the form and the content of the true modern sensibility. Through following the primitive codes of loving nature and applying his hard earned unified sensibility, he was able to invest nature in his writing with freshness and life. The other prominent modern writer was W. H. Auden. Auden crafted his own unique view towards nature. He treated it in his work in a simple way as a background to the activities

of human beings, such as, “Praise of Limestone,” “The Enchafed,” and “Look Stanger.” He used both the urban and natural landscapes symbolically, and they were usually depicted as stark and bare. T. S. Eliot’s and W. H. Auden’s influence on Yeats was very remarkable, and his personal typical treatment of nature was well designed in his poetry. Yeats believes in the importance of honoring nature through symbols.

Through the analysis of this historical survey, it is clear that the damage of the natural environment was due to the emergence of modern industrialization of the nineteenth century. This statement is well clarified by Geoffrey Jones and Christina Lubinski. They confirm, “The emergence of concerns that industrialization and modernization were damaging the natural environment date back to the nineteenth century” (3). Scholars of literature have not treated such environmental damages in the same way, but all such treatments are very important to strengthen the last decades’ representations of environment in literature. The progress in constructing and reconstructing it in their texts from the nineteenth century continues to be significant in the twenty-first century. In the nineteenth century, the construction of nature was built upon the multiple local social and scientific developments of the century. Therefore, it was considered “as a flexible concept,” and “the idea of nature is continually reconstructed in literary texts and is deployed for a range of political and didactic purposes...particularly those relating to industrial progress, imperial expansion, religion, and education” (McKechnie et al 1-2). These imaginative cultural negotiations about nature throughout the literary history are very important and help to grapple with the contemporary global

environmental issues. Thus, the nature of awareness about environmental issues has gone through a number of stages, moving from local awareness in the nineteenth century towards a global one in the twenty first century.

III. Historical Survey of Climate Change Fiction

The impact of the Industrial Revolution has been profound on the natural environment. Men have caused environmental degradations that have led to dangerous effects, such as, extreme weather, monster storms, heat waves, rising sea levels, melting polar ice caps, species extinction, water and food scarcity, etc. Though such environmental degradations contemporarily have become observable, still there is confusion or even denial to this environmental problem. "Climate change is understood to be urgent and important, and at the same time, is widely seen as boring, difficult and confusing. It poses a global risk, and yet is highly divisive. It represents a defining challenge for our age, and yet it is one that many people choose to ignore and some, even, to deny" (Smith, et al 6). Thereby, these discussions were a very inspiring arena for writers to create stories to depict such new realities about the environment under the flag of climate change fiction. This section; therefore, seeks to explore the emergence of climate change fiction by providing its definition, its main characteristics, and referring to some of its major writers and their works.

Climate change is one of the most widespread concepts of modern times. It has gained a lot of interest, and people, both literate and non-literate, around the world, have started to talk about it because they really feel its presence. In daily life, one may hear ordinary people complaining about new environmental changes and degradations. Scientists, climatologists and geologists prove such statements in their scientific reports and claim that Earth has started a new geological era, resulting from human beings' harmful activities towards nature. Michael Dittmar et al in their article, "Man-Made Climate Change: Facts and Fiction," summarize and discuss the most important issues about climate change as follows:

> A large body of evidence shows that the world climate is getting warmer. Climate models give a consistent explanation of this observation once human-made emissions of greenhouse gases are taken into account. Furthermore, the main source of greenhouse gases comes from the burning of oil, gas and coal, mainly in the industrialized countries. Without any change of behaviour, the possible predicted consequences of this climate change for the coming decades are very disturbing. Today's (in)action's will have long-term consequences for the entire biosphere and the living conditions of many future generations. (1)

So, what is climate change? How has climate change, as a scientific issue, entered literature? Or how could literature have opened the door to this scientific subject?

In "Climate Change and Sustainable Development," Tariq Banuri et al define climate change as "a serious and urgent issue" (1). They claim, "The Earth's climate is changing, and the scientific consensus is not only that human activities have contributed to it significantly, but that the change is far more rapid and dangerous than thought earlier" (1). Moreover, Muhammad Ishaq-ur Rahman in "Climate Change: A Theoretical Review"

believes,

> ‘Climate Change’, the most uttered environmental term of present time has been used to refer to the change in modern climate brought predominantly by human being. It is perhaps one of the most serious environmental issues that today’s world population facing [1-3] though the issue is not new. (2)

Muhammad Ishaq-ur Rahman, in the same article, contends that climate change as a topic appeared in the early nineteenth century, and in the late twentieth century, it has been discussed exclusively as a scientific topic. However, during the mid to- late 1980s, it emerged as a public agenda. Since that time, as Ishaq-ur Rahman writes, it has developed to become a serious global issue to be treated,

> In one hand, it has been manifested by the believers that consequence of human activities on world climate has reached to an alarming state and posing critical threats to physical, socioeconomic structures. On the other hand, the sceptics have presented fairly enough evidence to disqualify the anthropogenic trait of Climate Change...Thus with increasing public involvement in the Climate Change discourse and ensuing awareness regarding the potential risks and uncertainties attached to the issue, it has been debated and problematized from diverse standpoints. (2)

Anthropogenic climate change; thus, has not only effected the Earth but literature as well. In “What the Warming World Needs Now Is Art, Sweet Art,” the American writer, Bill McKibben wondrs about the literary books that advocate a call for climate change insisting on providing sweet art for this warming world. He writes,

> If the scientists are right, we’re living through the biggest thing that’s happened since civilisation emerged. One species, ours, has by itself in the course of a couple of generations managed to powerfully raise the temperature of an entire planet, to knock its most basic systems out of kilter. But oddly enough, though we know about it, we don’t know about it. It hasn’t registered in our gut; it isn’t part of our culture. Where are the

books? The poems? The plays? The goddam operas? (par1)

The British travel and nature writer, Robert Macfarlane, on the other hand, declares in his article, "Generation Anthropocene: How Humans Have Altered the Planet for Ever," that writers and artists should take a serious stand and react towards this noteworthy contemporary environmental issue. "We are living in the Anthropocene age, in which human influence on the planet is so profound - and terrifying - it will leave its legacy for millennia. Politicians and scientists have had their say, but how are writers and artists responding to this crisis?" (Sykes et al 5). Therefore, the Antropocene, the current geological era, "a period in which human activity has become the dominant force on climate and environment" has become their recent field of interest (Sykes et al 2).

Today, anthropogenic climate change or the Anthropocene has entered the literary imagination and has become the major concern of science fiction writers. It has become; then, a controversial issue that has exceeded itself from science to emerge as a dominant theme in literature. This has given rise to the term, "Anthropocene fiction," or "climate change fiction," which has been categorized as the hottest emerging subgenre in science fiction, and it is abbreviated as 'cli-fi.'[2]

Climate change fiction deals with climate change or global warming. In her article about climate change in literature and literary studies, Adeline Johns-Putra defines it as, "as fiction concerned with anthropogenic climate change or global warming as we now

[2] The term, 'climate fiction' " was coined by the Taiwan-based North American activist and blogger journalist, Dan Bloom in 2007 as a subgenre of science fiction" (Chameides par 1).

understand it; with such a definition, the number may, of course, be lower but this is countered by the fact that it is still growing, and has grown since Trexler made his estimate" (386-7). However, some critics have differentiated science fiction from climate fiction and want to separate it as a genre that stands by itself. According to them, in the climate fiction novel, there is an endorsement of moral responsibility to change, and an acute awareness of global ecological threats. Dan Bloom clarifies such difference by stating,

> The difference is that cli-fi is written with a certain moral sense of what things might be like if we do not stop climate change and global warming, whereas sci-fi is more concerned with science and amazing stories and adventures created mostly as escape and entertainment. Cli-fi is not about escapism or entertainment, although cli-fi novels and movies can be entertaining, too. But cli-fi has a moral imperative. Sci-fi does not. (Quoted in David 23)

Grounded in the scientific realities of environmental change, climate change fiction embraces today's anthropocentric discourses to reimagine and forecast the possible futures of the planet at the time of crisis. Human beings' damage to the natural world is obvious as what Koko Warner states in "Climate Change and Global Warming: The Role of the International Community". He declares, "In the anthropocene era, the interaction of humans with natural environments which they are changing has led to patterns of loss and damage relevant for human society" (5). Since science fiction writers try most of the time to frame reality and reflect the level of human beings' life, in their writings, they usually tend to be prophetic to interpret the future situation after this damage and loss. Through creating imaginative futuristic worlds, they discuss the various results that change may

bring to the human life; through utopian optimistic visions or through dystopian pessimistic visions.

Behind their speculative narratives, science fiction writers aim to find solutions to a number of problems and concerns that Humanity is suffering from. Accordingly, climate change has become the newest concern they should talk about in an attempt to realize what scientific reports are unable to do sine scientific data and numbers are not enough to raise awareness among people. For them, literature should challenge and take steps towards such missions. Therefore, in science fiction, literary imagination is considered as a tool to help in the protection of the world from this global ecological threat by imagining alternative future worlds, wondering about climate change because "imagination is the key to pre-experiencing alternative futures" (Kepes Quoted in Yusoff et al 117).

Chiefly, in climate change fiction, novelists try to interpret the present and the future situation of the planet because of such rapid climate change. Their creativity has led them to respond and give birth to a number of cautious stories varying from coming of age, personal growth and transformation, humour, pathos, interconnection, vulnerability, resilience, and tragic losses in the times of climate change. All such discussions have led to raise a fundamental question in literature: What is the real cause of climate change? Actually, the answer is given by the American historian, Donald Worster. According to him, the global crisis the world is living is not because of malfunctioning ecosystems;

rather, it is because of malfunctioning human ethical systems. He affirms,

> We are facing a global crisis today, not because of how ecosystems function but rather because of how our ethical systems function. Getting through the crisis requires understanding our impact on nature as precisely as possible, but even more it requires understanding those ethical systems and using that understanding to reform them. Historians, along with literary scholars, anthropologists, and philosophers, cannot do the reforming, of course, but they can help with the understanding. (quoted in Glotfelty xxi)

On the other hand, Yusoff Kathryn et al declare that climate change should not be imagined only as a scientific issue; instead, it should be reimagined as political, social, and cultural. "It is now well understood that anthropogenic climate change is as much a political, social, and cultural event, as it is a scientific one" (118). Therefore, this has led to an increasing number of voices contesting for 'deculturing' climate change" (118). They state, "Climate change, in short, is being reimagined as an ethical, societal, and cultural problem that poses new questions and reconfigures the geographic imaginaries of the world" (118).

In this regard, Yusoff, Kathryn, et al distinguished between three distinct temporal and spatial imaginative framings of these new cultures of climate change. The first framing is to concentrate on the futurity of climate change that includes the arts and techniques of imagination to make scenarios, narratives, and contingency plans for uncertain futures. They consider :"In the imagining of the unimaginable, these extreme scenarios often seek to redefine or challenge the acceptable limits of the discourse of climate change through speculative science fiction or an engagement with what Susan

Sontag called the ‘aesthetics of disaster’” (118). They also insist on the uncertainties inherent in climate impacts and predictions instigate this speculative turn in climate futures because “these uncertainties open a generative space of unknowing that has been populated by various ‘visions’ of the future. The arts of this futurity are anticipatory, preemptive, and promiscuous” (118).

The second imaginative framing of climate change resides in the appearance of an unspoken acceptance for the need for adaptive strategies that can be embedded in everyday practices. This involves an imaginative re-forming of climate change “as something that is not ‘out there’ (located in a global imaginary or in distant places such as the Arctic or Sub-Saharan Africa), but as something that has relevance for all cultures across all scales” (118). Therefore, ‘in here’ is interwoven in contemporary practices and future possibilities.” In the same context, they add:

> This process of re-public-ing and relocate-ing climate change has motivated a number of projects that rework the representational practices of climate into the intimate and social sphere. These practices are in distinct contrast to the causal models of climate- change that imagine humans as either drivers of climate change or recipients of its effects, rather than as a heterogeneous and differentiated social body with distinct desires, constraints, and imaginations. (118)

The third framing of these new climate cultures is that this ‘cultural turn’ in climate change has witnessed a critical engagement with the practices of climate science, such as science-art or art-public collaborations, aiming to redefine the boundaries of climate beyond science. They claim that this has led to the raise of a cooperation of creative

practice and public engagement by both the academics, who are interested in the social and historical study of science and the creative practitioners, who are interested in engaging in what this scientific knowledge does in the world. They insert,

> These responses to the dominance of science-led investigations into climate change have sought to find ways in which to democratize climate science by reorientating the models of practice and politics of expertize, as well as reimagining the experience of environmental data and the possibilities of its use with diverse publics. (119)

The question that can be asked in this phase is: What are the main characteristics of climate change fiction? In their article about the dystopian impulse of contemporary climate fiction, Julia Leyda et al contend that seven main key elements may describe climate change fiction which are contemporary, controversial, trans-medial, transnational, didactic, generic, and political (12).

Climate change fiction is contemporary because of two reasons. First, remarkable cultural texts have flourished recently to articulate the implications of anthropogenic climate change though narratives of human interferences with the weather. Contemporarily, these works foreground the human role in causing such a phenomenon, but at the same time, they show how they can adapt it through fictional engagements with catastrophic results. Second, it is contemporary in the sense that its stories are significantly set in the present or just in the very near future. This distinguishes them from forerunners' texts, such as, Frank Herbert's *Dune,* that relies on distant futures and outer space settings

(Leyda et al 12).

Climate change fiction is also controversial since it continues to develop to mean more than its original use. It is used within many university disciplines, embracing the new food of fiction and film which deal with climate change in humanities courses and beyond. Transmedial is another key element in climate change fiction because the term, 'climate change fiction,' or 'cli-fi,' is practically desirable in film and media studies. From another perspective, climate change fiction is transnational in the sense that it focuses on the global phenomenon of climate change. It tries to foster an international outpouring of creativity that often aims at having a collective artistic engagement for the topic of climate change, linking all national boundaries in terms of content, production, and audience (Leyda et al 13). Moreover, climate change fiction is didactic, aiming at fostering and transmitting awareness among a large scale of audience towards this natural phenomenon. It is also generic since it has the capability of standing alone a s separate literary genre, and political, offering public political insights (Leyda et al 13-4).

Adeline Johns-Putra and Adam Trexler made a big impact in the evolution of climate change fiction. Together, they wrote the history of climate change novel and classified the novel that could be included under this new genre. In "Climate Change in Literature and Literary Studies: From Cli-fi, Climate Change Theater and Ecopoetry to Ecocriticism and Climate Change Criticism" (2016). Johns-Putra discusses the emergence

of climate change fiction. She identifies a list of novels that might be labelled climate change novels, starting with Arthur Herzog's *Heat* (1977) that she considers as the first climate change novel. Thanks to it, "'the history of climate change fiction begins in earnest." The list includes thirty novels: science fiction including: George Turner's *The Sea and the Summer* (1987), Kim Stanley Robinson's *Science in the Capital trilogy* (2004-2007) and Paolo Bacigalupi's *The Windup Girl* (2011), and other lesser known texts. Johns-Putra has also states that after the appearance of McEwan's novel, *Solar,* about twenty or so climate change novels have appeared and gained significant critical and public attention. The majority of these novels may be categorized as dystopian or post-apocalyptic. Other notable science fiction novels set in future climate-changed worlds include *The Peripheral* (2014) by the steampunk writer, William Gibson.

Johns-Putra points out that only a small array of recent climate change novels are set in the present, including J. M. Ledgard's *Submergence* (2011), Barbara Kingsolver's *Flight Behavior* (2012), and James Bradley's *Clade* (2015). Because of its innovative style and fragmented, inward-looking narratives, *Submergence* is characterized as postmodern. The novel contrasts the estranging and alienating experiences with war and climate change of two lovers. *Flight Behaviour* is more conservative and realist. It presents an unexpected encounter of a young woman with the climate change's scientific and moral demands while dealing with an ecological disaster. *Clade* ends in the near future. It presents a wide

understanding of climate change in the lives of one family across numerous decades.

Surveying this fiction proves that climate change is used as an imaginative device. The difference Johns-Putra has made between present-day and futuristic settings is very interesting. With contemporary or very near-future settings, climate change is considered as a phenomenon that requires individuals' engagement as a political, ethical, or even psychological problem like in McEwan's *Solar*. Moreover, climate change appears in novels as part of a futuristic dystopian and/or post-apocalyptic setting. These novels depict climate change not just as an internal or psychological problem but for its external effects as well. Thus, climate change in these novels is often depicted as part of an overall collapse, including technological over-reliance, economic instability, and increased social division, emphasizing its physical dramas as well as its emotional or mental ones.

In this regard, the difficulty of survival becomes a dominant theme. Johns-Putra also noticed that a small number of novels approach climate change in a satirical mode. The best known satirical treatment of climate change is certainly found in McEwan's Solar. The novel centers on the flawed and unlikeable physicist Beard as a representative of humankind, who functions as an everyman, representing humanity at its selfish worst. Other significant examples of satire comprise Atwood's use of parody in the *MaddAdam* trilogy (2013), Rawson's light-hearted depiction of the future, and Greenfeld's darkly comic mocking of American

neoliberalism in *The Subprimes* (2016).

We can say that from its beginning, history has registered that the natural world has dominated the human imagination implicitly or explicitly, for it has penetrated all kinds of writings. The previous sections of this chapter prove that there is a close relationship between nature and British literature. Covering the different cultures that shaped the British society towards nature, this gave rise to a variety of novels depicted on the backdrop of issues concerning nature; especially, after the industrial growth that has led to an environmental loss. However, with the emergence of environmental literature or eco-fiction, narratives zoom out to beyond personal narratives to connect human beings to their natural habitat, a crucial connection that was ignored in the previous narratives. The cupidity of the industrial man and the growing population has caused environmental issues that have led to the appearance of another literary subgenre in science fiction, which is climate change fiction. The familiarity of climate change spread all over the world, and the need to give it a voice in literature had been the focus of many writers who felt it is their duty to tackle such an issue. All their efforts have led to the emergence of climate change fiction and precisely the birth of the climate change novel. This has also led, as we are going to see in the next chapter, to the raise of a new critical literary approach, ecocriticism, to study the humans' connection with nature in literature.

Chapter Two: Origins and Developments of Ecocriticism and Ecofeminism

Although the representation of nature and its degradation emerged more than two centuries ago with the starting of the Industrial Revolution in England, and has since then spread to occupy an important space in literature, especially, literary studies about environmental issues started to appear only after the nineteen seventies, when political, economic, and armed concerns increased over the environment on a global scale. Later, critics concerned about environmental degradation including pollution, global warming, climate change, deforestation, species extinction, ice melting, rising sea levels and other ecological themes organized themselves under a formed group identified as ecocriticism.

Ecocriticism centers itself on studying nature writing in general and environmental literature in particular. With the continuation of the global environmental crisis, it started to attract other disciplines as well, such as, ecology. This has given rise to three streams within it: deep ecology, ecofeminism, and social ecology. This chapter, therefore, focuses on ecocriticism, investigating its origins and growing trends. It is important to deal with ecofeminism as a literary approach at this level of my research since it is the theory that would be adopted in the analysis of the literary works selected for the present research, namely, Ian McEwan's *Solar*, Marcel Theroux's *Far North* , Margaret Atwood's *Oryx and*

Crake, and Sarah Hall's *The Carhullan Army.* The first section of this chapter deals with the origins and developments of ecocriticism and ecofeminism; whereas, the second section deals with their ecocriticial theoretical tenets. As for the third section, it is concerned with the fictional representation of climate change and environmental degradation and the emergence of the British climate change novel.

I- Historical Background of Ecocriticism and Ecofeminism

Although it has appeared recently as part of a broader response to the contemporary environmental crisis, ecocriticism is deeply rooted in history that goes back to the romantic era. However, with the globalization of environmental problems by the beginning of the twenty first century, it has started to attract the attention of many scholars and critics including Cheryll Glotfelty; Buell Lawrence; and others who tried to set definitions to the new discipline. In spite of being different, these definitions are of great importance because they help to structure the ecocritical theory and highlight its major principles and approaches. This section, therefore, aims to answer the following questions: What is ecocriticism? What are its origins? How did it develop? How did it help to give rise to ecofeminism? And what is its role?

The Routledge Dictionary of Literary Terms defines ecocriticism as "The study of literary texts with reference to the interaction between human activity and the vast range of 'natural' or non-human phenomena which bears upon human experience -

encompassing (amongst many things) issues concerning fauna, flora, landscape, environment and weather" (Peter Childs 65). In this definition, the focus is put on the practice of ecocriticism, considering that ecocriticism is generally applied to analyze literary texts on one basic stand, which is the relationship between a human being and his physical environment. In other words, it studies the representation of nature in literary works, ignoring totally the tradition promise that a human being is superior, and nature is merely a source he uses for his benefits. In ecocriticism, 'the other,' or the non-human world,' (or nature), becomes so vast to include the whole, and the human being is just part of it; he is just part in a whole ecosystem. As a result, the emergence of ecocriticism helps to give raise to a new literary category in literature, which is 'nature,' or 'place,' where all interest is put on it.

In her book, *The Ecocriticism Reader: Landmarks in Literary Ecology* (1996), Glotfelty presents a list of literary scholars, authors, and ecocritics who set the first seeds of the ecocritical theory. Moreover, she offers ecocriticism one of the primary broadly accepted definitions; she claims that the simplest definition that might be given to ecocriticism is as follows:

> Simply put, ecocriticism is the study of the relationship between literature and the physical environment. Just as feminist criticism examines language and literature from a gender-conscious perspective, and Marxist criticism brings an awareness of modes of production and economic class to its reading of texts, ecocriticism takes an earth-centered approach to literary studies. (xviii)

According to Glotfelty, the interconnection between nature and culture is the subject of ecocriticism because each one of them affects the other. She writes, "Human culture is connected to the physical world, affecting it and affected by it" (xix). In addition, she notices the cultural artifacts of language and literature. She declares that environment has a big impact on language, and that environmental issues clearly alter language discourse: This aspect will be studies taking into consideration the effect of climate change and its environmental degradation in the selected environmental climate change novels, Ian McEwan's *Solar,* Marcel Theroux's *Far North* , Margaret Atwood's *Oryx and Crake,* and Sarah Hall's *The Carhullan Army.*

Glotfelty also makes a contrast between ecocriticism and the other literary theories to highlight the characteristics that distinguish it from the other critical approaches. She asserts, "Literary theory, in general, examines the relations between writers, texts, and the world. In most literary theories, the term, 'the world,' is synonymous with society-the social sphere" (xix); however, ecocriticism for her "expands the notion of 'the world' to include the entire ecosphere" (xix). In this regard, she agrees with Barry Commoner's first law of ecology which says, "Everything is connected to everything else," and concludes that literature does play a very important role to combine ideas with the natural world., "Literature does not float above the material world in some aesthetic ether, but, rather, plays a part in an immensely complex global system, in which energy, matter, and ideas interact (xix).

On the other hand, Jelica Tosic states that the term, ecocriticism is composed of 'eco' and 'criticism.' She defines 'eco,' the short form of ecology, as the science of studying "the relationships between living organisms in their natural environment as well as their relationships with that environment" (44). By this, she has been able to provide ecocriticism with a very practical definition. According to her, ecocriticism is interested in "the relationships between literature and environment or how man's relationships with his physical environment are reflected in literature" (44). Far away from the traditional relationships the other literary theories focus on, such as the relationship between the individuals, the individual and his society, men and women in a patriarchal society, or the individual and his psyche, Tosic hints in this context to a newly concern in literary theories or environmental studies in general. She suggests that ecocriticism is the study of the relationship between man and the natural environment.

In the same article, "Ecocriticism- Interdisciplinary Study of Literature and Environment" (2006), Jelica Tosic mentions that literary critics had always been interested in the relationship between man and his physical environment. In this context, Tosic uses Laurence Buell's comments on the importance of applying ecocriticism in literature, confirming that the understanding of the human existence is related to the understanding of his surroundings. According to Buell, who is one of the most important researchers of American Transcendentalism and a forerunner

of ecocriticism, there is no human being without the natural world; there is no "is" without "where" (44). Such understanding requires both scientific science (through ecology, which helps to understand his physical environment) and human science (Through literature where human beings are put metaphorically in extreme situations to testify any change they make to the world).

Tosic affirms that only two ways can explain this interest in climate change literature. The first one is "man always exists within some natural environment, or according to Buell, there cannot be is without where" (44). The second interest according to Tosic refers to the fact that the twentieth century last decade's main interest was to protect the survival of the Earth. He reveals, "The last decade of the twentieth century was the time when it became obvious that the greatest problem of the twenty-first century would be the survival of the Earth" (44). This shows that a total change has occurred in the humans towards environmental degradation, from local to global, from the bad consequences of the Industrial Revolution in the industrialized areas towards the whole planet, insisting on the survival of the Earth.

In another context, Buell defines ecocriticism as "an interdisciplinary movement committed not to any one methodology but to a particular subject: the subject of how literature and other media express environmental awareness and concern" (7). In the same context, Buell discusses the emergence of ecocriticism. He

confesses that due to two reasons in its departure, ecocriticism is "a somewhat confusing and inadequate term" (8). The first reason is related to the narrowness nature of the prefix, 'eco,' which evokes "biotic or natural world" to cover the wide range of environmental concerns. The second reason is associated with a group of ecocritics, who refused to be called 'ecocritics.' According to them, the term is "excessively restrictive" (8) because ecocriticism was firstly applied to study nature writing and post-Wordsworthian nature poetry, where the emphasis was put on reconnecting people with nature. However, Buell considers, "ecocriticism is nonetheless the omnibus term, or nickname, by which environmentally-oriented literary studies is most likely to be known for the foreseeable future; and so I retain use of it here" (8). By this, Buell seems to be optimistic about the development of ecocriticism, relying a lot on its role to help in the protection of the world.

Another definition given by David Taylor helps to give a new meaning to ecocriticism. Taylor states, "Ecocriticism is certainly a broad, gangly term that groups very disparate types of criticism: some overtly polemic, others seemingly disinterested in cultural critique" (15). In this definition, Taylor focuses on the polemic form of ecocriticism, which has originated from ecology. According to him, through analyzing the cultural constructions of environment, ecocriticism invokes readers to readjust their own cultural constructions of environment.

After defining ecocriticism, surveying its history is another important step in this research section. So what are the origins of ecocriticism? From a historical perspective, the ecocritical thinking is not a new phenomenon. Rather, it has deep roots in an Anglo-American tradition. Ecocriticism has existed in the Unites States of America for a long period, taking its origins from the American Transcendentalism of the 1840s created by Ralph Waldo Emerson, Margaret Fuller and Henry David Thoreau. These writers celebrate American nature in their work, manifesting the life force and the wilderness. In the United Kingdom, the origins of ecocriticism or green studies are taken from the British Romanticism of the 1790s. In "Ecocriticism in British Romantic Studies," Kevin Hutchings states in British literary studies, ecocriticism started with Romanticism that could be called "Romantic ecology" or "green Romanticism." Hutchings confirms that Romantic ecocriticism was based on one principle premise: in literature, writers should reflect and help in shaping "human responses to the natural environmental" (172). Therefore, the main task of Romantic ecocriticism as expressed by Hutchings was to explore "the ways in which Romantic writers and thinkers participated in and responded to the history of ecological science, environmental ethics, and environmentalist activism" (172). The Romantic writers were aware about the different environmental degradations caused by the Industrial Revolution. With the development of ecological science, they tried to show that ecological spaces (systems) and their species, which are part of nature, were in danger. Immediately,

these writers' interest changed from nature sublime to nature destruction, blaming largely human ethics and behaviors for causing their environment's degradation.

Contemporary writers, relying on the progress of social sciences, have broadened the definition of environmental problems from land degradation or ecological aspects to include sociokog, behaviourism, and ethics. Richard Kerridge hints in his article, "Ecocriticism," to the appearance of a new challenge to ecocriticism He states, "Since the climate is a global system in which no locality functions separately and self-sufficiently, and since the climate is changing due to CO2 emissions from human industrial activity, no part of the world, however small and secluded, can be described as purely natural" (345). Therefore, a call for establishing ecocriticism as a literary theory used at a larger scale becomes a necessity to help in the protection of the world from the global environmental degradation in general and global climate change in particular. So how did ecocriticism develop as a body of literary criticism?

The term, 'ecocriticism' has first appeared in an article written by William Rueckert in 1978 "Literature and Ecology: An Experiment in Ecocriticism," but Rueckert did not succeed to provide it with a definition (Glotfelty 105). The term was used to designate a burgeoning literary approach dealing with the natural world. Yet, it was just a movement within U.S. and British literary studies, not a transnational project. At the beginning, the movement had no name. It started with a

meeting of a small group of American critics merely to study American environmental literature. This was followed by another important contribution made by Cheryll Glotfelty in her book, *The Ecocriticism Reader: Landmarks in Literary Ecology* (1996). In the book, Glotfelty tried to collect a number of articles dealing with the ecocritical canon in an attempt to define it. In addition, in 1995 a number of chief expert conferences were held to discuss the issues related to ecocriticism.

From the above attempts, a group including Lawrence Buell, Cheryll Glotfelty Simon C. Estok, Harold Fromm, William Howarth, William Rueckert, Suellen Campbell, Michael P. Branch, and Glen A. Love have become its most prominent ecocritics, emphasizing "the importance of thinking of national imagination and national territory as interconnected with the rest of the world, not distinct from it" (Fiedorczuk 8).

American writers call this theory 'ecocriticism' whereas British writers favor to call it 'green studies'. Both terms are used to denote a critical approach which began in the USA in the late 1980s and in the UK in the early 1990s. For Barry, the difference between both is that American writers try to celebrate nature in their writings as their ancestors did. "The American writing to be 'celebratory' in tone (occasionally degenerating into what harder-left critics disparagingly call 'tree hugging')" (162). British writers, for their part, warn readers of the various environmental dangers, "The British variant tends to be more 'mina-tory,' that is, it seeks to warn us of environmental threats emanating from governmental, industrial,

commercial, and neo-colonial forces" (162). And this is the core of this research study, where the focus is put on how British writers present climate change in their eco-novels and how they warn their readers about the issue and raise awareness among them about its catastrophic shortcomings. This will be presented in the second part of this research in a sample of selected climate change novels of male and female writers who are Ian McEwan in his book *Solar,* Marcel Theroux in *Far North,* Margaret Atwood in *Oryx and Crake,* and Sarah Hall in *The Carhullan* Army.

However, Lawrence Buell, in his valuable book, *The Future of Environmental Criticism: Environmental Crisis and Literary Criticism (2005),* traces the development of ecocriticism. In this book, Buell confirms that environmental criticism is the result of the modifications made by human beings to the environment. He emphasizes that this literary theory has a big importance in addressing the current environmental crisis because it does not only include traditional environmental writings; its critical and creative accomplishments are relevant to contemporary life. In "The Third Wave of Ecocriticism: North American Reflections on the Current Phase of the Discipline," Scott Slovic talks about the raise of a new third wave of ecocriticism, which started to emerge in 2000 and continues to develop at current times.

According to Slovic, four major characteristics distinguish this new phase.

The first is to meld global concepts of place with neo-bioregionalism (giving rise to a number of neologisms, such as, "eco-cosmopolitanism," "rooted cosmopolitanism," "the global soul," and "translocality"). The second is to make strong comparisons between post-national and post-ethnic visions of human experience of the environment. The third is the evolvement of "material" ecofeminism, ranging from eco-masculinism and green queer theory. The last is to focus on animality (evolutionary ecocriticism, animal subjectivity and agency, vegetarianism, and justice for nonhuman species) (7). Another point Slovic adds to this new phase is its "critique from within," a new trait that did not exist before. According to him, the critics, Dana Phillips, Michael P. Cohen, and others, have taken the task to look for the field's lack of "engagement with critical theory, its embracing of representationality in literature, its celebratory tone, its limited focus on "literature," the forgotten role of ecofeminist activism, and the lack of a precise methodological definition of ecocriticism" (7). Slovic adds that what can be observed also about this new wave of ecocriticism is the "polymorphously activist" tendency, used by scholars, leaders and teachers to look for "new and old ways to connect their work to social transformation" (7) for many purposes. He writes: "some are now using literature as a means of illustrating sustainable lifestyles, while others, such as John Felstiner in his 2009 *Can Poetry Save the* Earth?, are employing poetry as an agent of environmental activism" (7-8).

From the above waves, the most worth mentioning development of ecocriticism is ecofeminism, the newest form of the feminist theory. Stemming from the global environmental crisis caused by industrial and modern accelerations, ecofeminism has also appeared to protect and save the environment. As a term, 'ecofeminism,' was coined in 1974 by the French writer, Francoise d'Eaubonne. It has been used to identify a movement that started as ecological- oriented movement towards the breaking of traditional patriarchal structures (Alkhattabi 1) led by women, and then it has developed through a spontaneous to a conscious process to contain numerous sub-branches and four major sub-schools, including cultural ecofeminism; spiritual Ecofeminism; Socialist ecofeminism; and Social Ecofeminism. In "The Roots of Ecofeminism in Terry Tempest Williams 'Refuge,' Nouf Alkhattabi defines ecofeminism as "a movement that shows the link between the degradation and exploitation of nature besides the oppression of women by men" (1).

Ecofeminism has developed through three phases. The first phase started during the 1960s. During that period, the movement revealed the challenge of American writers towards the large nuclear power stations. It showed general ecological awareness about the everyday life of women workers in an attempt to express their interests in the protection and preservation of the environment. The second phase lasted from 1970s to 1980s. It was initially characterized by the

creation of the ecofeminist concepts and ideas. The third phase has continued from the 1980s till the present time and has witnessed new developments in the theory of ecofeminism though it has gained theoretical development from the ecological movement.

For ecofeminism, the origin of natural domination and gender domination is patriarchy, and it is necessary to oppose patriarchy through unifying the principles of feminism and ecology to liberate both women and nature. Therefore, it aims, as Chen Ling states in his article, "Ecological Criticism Based on Social Gender: The Basic Principles of Ecofeminism" (2014), "to reveal the relation and origin between natural domination and gender domination". It considers that there is an internal relationship between nature and women; thus, it tries to examine men's oppression of both women and nature and analyze the link between them or precisely women and Earth. Drawing on the concept of gender to analyze the relationship between human beings and nature, it aims to remove patriarchy and stresses the role of women experience in ecological movement. According to ecofeminists, the realization of women's liberation should be obtained through connecting strongly ecocriticism or ecological movement with the regional and global movements of women liberation. Moreover, for ecofeminists, in defending their rights to get their freedom, women can also play a very important role in solving the environmental global crisis from a gender perspective.

Combining the feminist and ecological perspectives, ecofeminism tries to fight against the traditional culture that considered men as "rational agents," who can perform well economic, educational, and political positions, and women as "irrational agents," who are by nature "biological reproducers" and not able to occupy male occupations. It tries to replace this patriarchal culture with other new cultures to help obtaining the liberation of both women and nature. Under male subjugation and exploitation, ecofeminism tends to call for new social structures and put an end to a society that gives the role of the maintainer of the old culture to men and the role of the helper of natural forces to women (Alkhattabi 3).

In this context, Susan Baker stresses six reaffirmations that help to reshape gender and nature in a new structured society. Men should confess that both the Earth and women are crucial to existence, and women have to be protected since they are biologically able to give birth. In addition, human beings should accept the interconnectedness of women and nature in terms of mutual coexistence; the absence of one of them means the absence of the other. The other reaffirmation is that ecofeminism has existed for a long time. Moreover, the association of women with nature helps to celebrate women's spirit. Finally, man should reconstruct language to modernize its discourse to be fair to women and closer to all forms of nature and living beings (Alkhattabi 4).

Jean Arnold who believes that ecocriticism plays a significant role to cross ethnic and cultural boundaries, not only to increase awareness but also to encourage "an understanding of a diversity of practices that could become a mutually beneficial form of knowledge with practical applications" ("Forum on Literatures of the Environment" 1989). The other role Arnold believes ecocriticism can play is to connect humanities with the other disciplines. This combination creates recent forms of knowledge or as he calls it, "a cauldron of brand-new perspectives" because "Looking at texts for their ideas about the natural world results in a cross-fertilization of the humanities with other academic disciplines" ("Forum on Literatures of the Environment" 1989). By this, he means that it is very necessary to make such combination between literature and the other sciences like biology, cultural theory, biochemistry, art, ecology, and history to help raise awareness even in academic disciplines and find possible solutions to solve the environmental crisis issue.

In addition, and like the other literary theories that are based on specific lens, such as, Marxist, Formalism, and others, which focus on gender, class, and race, ecocriticism and ecofeminism are based on their own lens whose focus of critical inquiry is the natural world. So what are the theoretical tenets behind these literary theories? The second section of this chapter will try to answer these questions.

II- Ecocritical Theoretical Tenets

Ecocritics adopt an interdisciplinary method in their works, applying human sciences and ecological knowledge and concepts in their analysis, taking into consideration scientific, social, and artistic concerns simultaneously. Their chief aim is to raise global awareness towards the protection of the environment. Thus, ecocriticism has been used as a tool to overspread environmental awareness as a necessity for human beings to change their life style from exploiters of nature to protectors. This belief concerning the nature of the relationship between man and nature is the core stone of an ecocrtitical analysis, where ecocritics tend to explore this relationship, and how man with his anthropocentric thinking causes the destruction of nature.

This section aims to shed light on the theoretical tenets of ecocriticism, its main aspects, principles, and the criteria and methods ecocritics use to analyze environmental or eco-fiction works; or in other words, climate change fiction. In, "Ecocritical Approach to Literary Text Interpretation," Neema Bagula Jimmy states, "because of the diversity of the stuff it deals with," ecocriticism is not easy to define, and having an idea about its aspects will help to better understand this theory. Bagula lists eight aspects of ecocriticism: interdisciplinary, nature, environmentalist, anthropocentric, ecologic, science, wilderness and conservative. It is interdisciplinary since it brings knowledge from different fields and studies objects

from different perspectives. In this context, Bagula explains through the example of a rose, how objects can express varied meanings related to many disciplines. He states,

> A rose can be a symbol for love. A rose is also a woody perennial that's part of the genus Rosa. A rose is also a royal flower. A rose can be studied from the perspectives of philosophy, botany, and history, or more. And that's the heart of interdisciplinarity. (371)

The other aspect Bagula mentions is nature. Regarding "some pretty heated arguments about what does and doesn't qualify as nature" (371), two possible definitions of nature are established. "Nature = A place where humans are not—both physically and metaphorically speaking. Nature = everything everywhere" (371), or in other words, nature is everything but not what is made by humans. As a result, ecocriticism gains its other aspect, which is environmentalist, or taking care of environment with all its components as expressed in the following:

> Like that political movement of environmentalism, ecocriticism also strives to make people care equally about all creatures that live in any single environment. In practice, any side of the environment that is victimized by people in a way should push be repaired as soon as possible so as to seat that equality of human and nonhuman individuals who should be cared about the same way. (371)

The fourth aspect of ecocriticism Bagula remarks is anthropocentric, where "people tend to see themselves everywhere, in everything" (371) through making comparisons between themselves and the surrounding environment. Such

comparisons are useful for humans to set "a place in literature, botany, zoology, and love, which is ecocritically abusive and refutable" (371). The author uses this example to illustrate this point: "You will hear Man, for example say: 'that leaf sure looks like my lover's hand'. 'And that pig in *Animal Farm* was my high school gym teacher" (371). He adds, "Regularly, when anthropocentrism enters the scene, nothing can be analyzed without being compared to or informed by human perception, affinities, desires, and so on". By this, he contends that ecocriticism is against anthropocentric human tendencies and self-analysis and considers nature on its own terms. However, it takes into account how Man considers nature at various historical moments.

Evolving from ecology, the fifth aspect of ecocriticism is ecologic. As it was explained earlier, ecology is the study of the interaction between living things and their interaction with their environments. This aspect leads to the fact that ecocriticism gains another aspect, which is new materialism. Ecocritics consider that,

> Humans cannot be reduced to their physical properties, because people are really special. The same way, the New Materialists say that People are made up of their biological bits, which means that even human thought, and human creativity, that is, those idealistic qualities Man often likes to believe elevate him above other animals, are just part and parcel to human physiology....The response is all but negative because the ideal at every step is to make complementarity and equality among all creatures. (372)

Since it is interdisciplinary and gets its knowledge from many disciplines, ecocriticism is also science. Ecocritics use the same tool used by scientists, who observe; for instance, diseases and try to cure them out of this observation. This

scientific aspect of ecocriticism according to Bagula started with Henry David Thoreau and the adventure he made in the wilds. On that occasion, Thoreau was able to create a literary piece of writing out of an observation he made on "growing beans," confirming that as observation is used in science, ecocriticism also uses observation to explain natural behaviors. The use of observation may help humanity to restore the world or the life of all creatures, humans and nonhumans. The other two last aspects of ecocriticism are wilderness and conservatism. Through wilderness, ecocritics call for the "magical land that is far away from human cities, cars, annoying appliances, and repetitive office work, the wi-fi router... wilderness" (372). Being conservative, ecocriticism is used as a strong tool to reduce the negative impacts made by human beings against the environment defense and the preservation of "this beautiful world we inhabit for future generations of humans" (372).

Concerning ecocriticism principles, William Howarth highlights the major characteristics that distinguish ecocriticism from other disciplines. He first explains the meaning of the word as originating from Greek by stating, "Eco and critic both derive from Greek, oikos and kritis and in tandem they mean 'house judge,' which may surprise many lovers of green, outdoor writing" (69). Howarth also highlights the characteristic that distinguishes ecocriticism from the other literary theories, mainly, characters and their psychology. Ecocriticism, according to him, focuses on the outside, the house and its surroundings, rather than the inside of characters in a

world including the entire ecosphere. Therefore, Howarth insists that the ecocritic should examine any literary piece of writing with a critical eye towards the portrayal of the natural world.

To analyze any nature writer's piece of writing, Howarth says, the ecocritic should follow "a set of informed, responsible principles, derived from four disciplines: ecology, ethics, language, and criticism," which together constitutes ecocriticism, which is used to explore environmental literature (71). Illustrating how such four components work, he writes:

> As an interdisciplinary science, ecology describes the relations between nature and culture. The applied philosophy of ethics offers ways to mediate historic social conflicts. Language theory examines how words represent human and nonhuman life. Criticism judges the quality and integrity of works and promotes their dissemination. Each discipline stresses the relations of nature and literature as shifting, moving shapes-a house in progress, perhaps, unfinished and standing in a field. (71)

For Howarth, these four principles should be organized into two groups, "ecology and ethics," "language and criticism." Howarth defines 'ecology' as a discipline that first appeared when writers began to express the undesirable effects of humans on the environment. It is "strongly connected to a history of verbal expression" (71). In other words, ecology helps to study the history of the land whether it is spoiled or unspoiled to preserve its story through observations and writings. He admits as a vernacular science, ecology was adopted by other disciplines to read, interpret, and

narrate land history. Therefore, ecology has helped to change "the Linnaean term natural economy from oikonomia to oikologia, house mastery to house study, a shift that changed species from resources into partners of a shared domain" (73). Moreover, many concerns raised in the study of ecology became social and ethical issues, especially in the 1960s with works, such as, Rachel Carson's book, *The Silent Spring.*

The rise of ecology marks an important shift in human's position towards the environment. Man is no longer able to live without his surrounding physical environment, and his idea of dominating nature comes to an end because with the evolvement of ecology, he becomes part of the whole ecological system and not his dominator. He affects nature and nature affects him; rather, the loss of nature leads to the loss of his identity. Therefore, Man should reconsider his ethical values towards the ecological system. Solving the global crisis the world is facing today requires him to understand his impact on nature and the ethical values that help in reducing the impact of such a crisis.

Regarding the link between language and criticism, Howarth emphasizes the importance of language to criticize any piece of environmental writing. He suggests that language should not be separated from criticism or any other science because through words a writer is able to represent the life of both humans and nonhumans. Therefore, ecocriticism does not look for language 'to represent' (mimesis), but it

does examine the ability of language 'to point' (deixis). He writes, "Ecocriticism, instead of taxing science for its use of language to represent (mimesis), examines its ability to point (deixis)" (80). By deixis he means locating "entities in space, time, and social context" (80). He adds, 'deixis' is related to the spatial locations appropriate to an utterance where places and things are identified by their distance from the speaker, using adverbs, such as, here and there, or using demonstratives like this or that: Through deixis, meaning develops from what is said or signed relative to physical space: I-you, here-there, this-that, expressing relative direction and orientation, the cognitive basis for description (Jarvella 80). Howarth concludes his article with a very important view concerning the evolvement of ecocriticism. He assumes to get a more structured area of literary criticism, ecocriticism should have its own canon; therefore, texts focused in the area should be grouped together and studied. He states: "After years of reading across several disciplines, from evolutionary biology and landscape architecture to environmental history and ethics, I've come to see that ecocriticism is evolving loosely because its authors share no sense of canon" (82). For the sake of gathering such canon, Howarth includes a "basic library" of thirty "basic" (82) texts concerned with ecocriticism in various fields, including natural sciences, geography, social sciences, history, American studies, and literature and other media.

Jelica Tosic in "Ecocriticism - Interdisciplinary Study of Literature and

Environment" comments on the importance of the link between the two diverse and separate fields, ecology and literary criticism to "restore the Earth's health" (44) since the two have the same aim which is to "preserve the where without which there cannot be is or the survival of man" (44). Accordingly, ecology is used in ecocriticism as deep ecology, physical environment is used as environmental imagination and re-imagination, biodiversity is used as global environmental culture and environmental unconscious, endangered species is used as eco-cultural habitat, and pollution is used as toxic discourse, literary hazards, or language pollution (44).

As a consequence, it is safe saying that ecocriticism is interdisciplinary and can benefit from its integration of other literary theories. However, as Scheese contends, in addition to being interdisciplinary, ecocriticism must be tolerant as well. Being tolerant means to welcome the opposing views "of those who argue there is no ecological crisis, who hold that environmentalism has gone too far in its methods and goals, who think that nature writing smacks of purple prose. Diversity is healthy, both in the ecosystem and in the academic community" (11-2). He adds that the theory and practice of ecocriticism are inherently political. Scheese believes that ecocriticism shares this principle with feminism, "At its best, feminism is a political act whose aim is not simply to interpret the world but to change it by changing the consciousness of those who read and their relation to what they read" (11). He asserts ecocriticism's aim is to make a change through raising people's awareness

about their natural environment.

In fact, considering the issue whether the examination of ‘place’ should be a distinct category in the same way as the three other categories of class, gender and race, is a crucial aim of the ecocritic. In his analysis, the ecocritic examines the text’s ecological values and looks for the meaning of the term ‘nature.’ He also examines how humans perceive ‘wilderness,’ and how this perception has changed through time. In addition, he examines the extent to which current environmental issues, for instance, climate change, are concerns of modern literature. Behind analyzing climate change fiction, ecocriticism tends to encourage literary representations of climate change to provide readers with messages to remedy the current environmental crisis: “of how to cope with, adapt to, or mitigate against climate change” (Adline 393). As Murphy alludes: “climate change fiction encourages us to move from denial to ‘recognition, acceptance, and the will to act” (Quoted in Adeline 393).

In brief, ecocriticism, the newly emerged literary approach, is the result of the various environmental literary and cultural studies made during and after the 1960s. The development of this theory has been made thanks to the development of environmental awareness. In this regard, environmental writers together with ecocritics aim to find solutions to such issues and focus on the protection of the environment. Reconciling natural sciences and human sciences, ecocriticism has

founded an ecological basis to examine the representation of nature in literature where man is blamed to be the first and the last destroyer of nature. The building of his civilization has always been over nature. Tough celebrating human progress through utopian science fiction, climate change fiction carries another perspective. Through the depiction of apocalyptic and post-apocalyptic stories, authors show their disagreement with human culture towards the natural environment and attract the attention of their readers towards wilderness, animals, and the Earth. By giving increased attention to the representation of nature in literature, ecocriticism aims to shift attention from social relationships towards natural relationships because Man cannot live without Earth, and he is in need of Earth since he depends on it to live.

III. Fictional Representation of Climate Change and Environmental Degradation and the Emergence of the British Climate Change Novel

Although the twenty first century has witnessed the emergence of multiple forms of Media, the novel still preserves its status as the dominant literary form that frames reality and holds the new challenges of literature; especially, in the context of the postmodern age where “literary studies” “exist in a state of constant flux” (Glotfelty xv). It is still a medium used to present stories in response to the different cultural tendencies that have shaped societies or the world in general. Thus, it has opened doors for new investigations about how literary imagination can be used as a means

to help in the protection of the world from the global ecological threat. Accordingly, this section aims to examine the various representations given to climate change and environmental degradation in British fiction. It seeks to answer the following questions: How do contemporary British writers respond to the current environmental degradation? And how do they imagine or present climate change?

In the age of climate change, the novel has become a vital tool to construct meaning drown up on climatology, the sociology and philosophy of science, geography, and environmental economics. It has expanded the scope of climate science beyond laboratories and turned abstract predictions into subjectively tangible experiences of place, identity, and culture. In addition to aesthetics, "they are also concerned with knowledge and truth in the wider sense, and in particular with the ethics of human behaviour" (Goodbody 8). The cultural geographer, Michael Hulme assumes, "climate change is as much a constellation of ideas as it is a set of material realities" (Quoted in Siperstein iv). Moreover, in "A *New Critical Climate*," Adeline Johns-Putra summarizes the nature of climate change and what should be taken into consideration about it. She writes,

> Climate change is invisible, suggests Sheila Jasanoff, as far as our feeling, talking, sensing, seeing selves are concerned, and yet is it real as far as our rational, knowing, scientific egos tell us. We encounter climate change as a discursive phenomenon and never a purely material one. Going further than Jasanoff, we should say that, in its discursive ubiquity and urgency (we all know about it, after all), it is unlike any thing we have encountered before. This is the impulse behind the naming of the Anthropocene and the

> enshrining of its status as the sixth mass extinction event. We have never seen anything like this. (1-2)

The appearance of anthropogenic climate change and environmental degradation in literature shows a high awareness among writers, whose main goal is not only to entertain their readers but also to motivate them through stories to change their life style, as a first step towards sustaining nature. Therefore, the nature of the relationship between human beings and their environment is a point of interest and a big debate for many of them, and their reaction towards it certainly provokes them to establish new trends and visions in their writings and helps them to respond with novelty. This novelty lies in the heart of how to present this worldly phenomenon and the form in which it should appear. In *Eco-Fiction: Bringing Climate Change into the Imagination,* Sophia David thinks it is evident that the climate change novel challenges the imagination because climate change is a very complex phenomenon. While no one is directly responsible for it, everyone has contributed to it; it is experienced locally but felt globally. More than that, it is invisible but trans- spatial, trans-temporal and latent with unpredictable consequences. According to her, the novel can artistically recast climate change and bring it into the imagination, for it can enable writers to personalize the issue and create stories so that they provide ways to talk about it and enchant humans towards an ecological imagining through a new form of a novel (14).

In "Towards a Unifying Narrative for Climate Change," Simon Bushell et al

contend that writing about climate change is not an easy task: “the complexity, scale, timeframe and all-encompassing nature of climate change mean that presenting the issue in a way that is meaningful and that resonates with people is extremely difficult” (4). They argue: “Climate change is an example of a ‘super wicked problem.’ These problems have certain key characteristics that make them extremely difficult to address.” They distinguish between four main characteristics of the problematic nature of climate change: "time is running out; those who cause the problem also seek to provide a solution; the central authority needed to address it is weak or non-existent; and, partly as a result, policy responses discount the future irrationally” (3). They state that though this problem has been studied scientifically, and scientists have been able to establish a set of available solutions to adapt it through reducing gas emissions, they notice that solving this problem from a scientific side only would not fit the situation. Because of a number of social and political considerations, a significant action gap between what should be done to prevent climate change’s worst impacts and what human beings are currently doing has emerged.

Thinking that this action should be stimulated through shifting the focus from scientific, technical and economic dimensions, they suggest to combine existing scientific, technical and economic knowledge into “a clear overarching blueprint,” (1) and this can be fulfilled only through a set of persuasive strategic narratives or

stories. They indicate,

> The process of developing strategic narratives would, itself, play an important role in unifying existing approaches, philosophies and attitudes to climate change into a cohesive and effective message and it is time for a wide range of stakeholders to come together and begin an iterative process of narrative forming through a constructive dialogue. This process should engage as many relevant stakeholders as possible, and is likely to require a catalyst or central agent to ensure a link to practice. The outcome of this iterative process should be a short, digestible and persuasive set of narratives that are then propagated by those stakeholders. (1)

At the end, they point that climate change should be presented in a strategic narrative through a number of ways. This includes uncertain information, selecting information, choosing the language, effective communication, and coherent messages undermining a coherent strategy (4-5).

In addition, Lucy Burnett in *Through the Weather Glass: What Icarus Found There* insists on three generic conventions that characterize the climate change novel: its content should be futuristic, its mode should be dystopian or apocalyptic, and its narrative form should be adhered to Aristotelian structures (22). Climate change was presented in earlier science fiction narratives as set on other planets rather than on Earth. Their authors were specialized in constructing 'other-worlds,' or 'novums' (Suvin 34) that were often depicted as a consequence of an extreme environmental change. The 'novums' are categorized as extra-terrestrial and/or futuristic, showing strangeness in planetary or temporal shift, or a shift in both of them. Such extra-terrestrial depiction of environmental or climate change is often associated with the theme of 'terraforming,' which was introduced by the

author Jack Williamson in a series of short stories (1942 and 1943). 'Terraforming,' 'earth forming,' or 'earth shaping' "refers to engineering any celestial body (planet, moon, asteroid, etc.) to resemble Earth, generally through the manipulation of temperature, atmosphere, topography, and ecology" ("What Is Terraforming?" Para 1). Terraformed settings are also found in classic science fiction, such as, Arthur C. Clarke's *The Sands of Mars* (1951) and Frank Herbert's *Dune* (1965). They often offer a remarkable story of how best to cope with an environmental disaster on Earth and make habitual planets by changing their climate.

Other science fiction texts are set on Earth instead of other planets. These texts are known as 'future histories' because the world depicted in the story is set in the future. These texts present ecological themes, starting from the 1970s rather than anthropogenic ecological change, including Brian Aldiss' *Hothouse* (1962) and J.G. Ballard's *The Drowned World* (1962), depicting a world climatically changed. However, with environmental awareness of the 1960s, utopian or dystopian future histories begin to deal with issues like bio-chemical pollution, acid rain, ozone depletion, and the greenhouse effect. Other novels deal with the climate current crisis with direct engagements. Best examples are T. C. Boyle's *A Friend of the Earth* (2000); the story is set in 2025 about global warming brought on by extreme deforestation that devastate the Earth, and Jeanette Winterson's *The Stone Gods* (2008), which presents climate change as a destroyer of Earth in the far future and that it no longer sustains life. Other worth notable novels have depicted climate

change as substantially or spectacularly altered climate-change settings with formally innovative strategies to adopt future-history approaches to climate change. This consists of Sarah Hall's *The Carhullan Army* (2007), Sarah Moss's *Cold Earth* (2009), and Marcel Theroux's *Far North* (2009).

In recent years, climate change has been presented under the umbrella of ethics. The loss of ethics has led to the loss of nature at the hands of science. Ian McEwan presents in his novel *Solar* (2010) climate change from the perspective of a morally- compromised scientist. He deals with climate change as a present day ethical dilemma rather than an environmental disaster set in the future. In fact, the climate change novel started to develop by dealing with climate change and environmental degradation by exploring post-apocalyptic settings that often restrained from a direct indictment of environmental disaster or issue. The reader was left to imagine the events causing the crisis and explore human experience in life-threatening situations. However, the climate change novel has developed in recent years to examine climate change and environmental degradation through the lens of science and current modes of scientific understanding and discourse (David 20).

Seemingly, presenting climate change and its negative consequences on environment and people is not an easy task because climate change is a complex phenomenon that needs a new type of novel. What scientists admit about it is not

enough; climate change and the various environmental degradations it may cause are also concerns of politics and culture. More than employing climate change as setting in their literary works; many novelists have started to explore it from psychological and social perspectives too. They consider that climate change occurs not only because of ecological crises or ‘out there,’ but because of the way human beings live and the inner dilemmas they may experience.

Conclusion

Investigating environmental literature in general and climate change fiction in particular involves deep thinking about the duality between 'humanity' and 'environment' and paying more attention towards the nature of the different relationships that shape this duality; marking out the various economic, political, and social alterations that have led to this environmental degradation, and above all the ethical one. Geologic, scientific and anthropological studies show that human beings' impact on the planet is very deep. Considering the loss of forests, the multiple industrial emissions, and the increase of energy consumption should make people aware about their relationship with the environment and feel a big responsibility towards understanding more about climate change.

Therefore, in the second part of this thesis, the focus will be put on analyzing the representation of climate change and environmental degradation in a selection of environmental novels, Ian McEwan's *Solar* (2010), Marcel Theroux's *Far North* (2009) Margaret Atwood's *Oryx and Crake* (2003), and Sarah Hall's *The Carhullan Army* (2007). Through the use of the ecocriticism and ecofeminism, the analysis will investigate on how such novels belong to ecofiction, a subgenre of science fiction, and highlight the ecocritical promises they raise to present climate fiction and environmental degradation.

PART TWO

NOVELS AS MEANS TO RAISE CONSCIOUSNESS ABOUT ENVIRONMENTAL DEGRADATION

Introduction

The Anthropocene, the current geological era in which human actions have negatively affected the whole planet, evokes the raise of environmental narratives that center on climate change and environmental degradation. The present part aims to analyze Ian McEwan's *Solar* (2010), Marcel Theroux's *Far North* (2009) Margaret Atwood's *Oryx and Crake* (2003), and Sarah Hall's *The Carhullan Army* (2007) through the application of ecocriticism and ecofeminism. In these novels, the writers have tried to present the Anthropocene and specifically the anthropocentric climate change, the human-made global environmental degradation, in different ranges of narratives. In their novels, they have used different scenarios varying from apocalyptic, post-apocalyptic, and /or dystopian visions. In these narratives, they have tried to raise environmental awareness through transforming their understanding, anticipations, uncertain discourses and alarms about climate change into stories, discussing with their readers the multiple solutions they think of to put an end to this environmental crisis. For them, storytelling is a valuable vehicle used to communicate and solve the current environmental problem, which "poses risks to humanity but risks that are still for many largely 'virtual' risks rather than real ones" (Nerlich et al 98).

This part is divided into three chapters developed through the application of ecocriticism. Since ecocriticism aims to highlight ecological concerns such as

pollution, global warming, deforestation and reduction of biodiversity, it is used to investigate climate change concerns in the novels under study. Through their stories, these writers do not only refer to climate change but refer also to narrative change. The first chapter is an ecocritical analysis of the first two eco-fiction novels written by male writers, Ian McEwan's *Solar* and Marcel Theroux's *Far North.* The second chapter is an ecofeminist analysis of the other two eco-fiction novels written by female writers, Margaret Atwood's *Oryx and Crake,* and Sarah Hall's *The Carhullan Army*. In the third chapter; however, focus will be on the language used to narrate the current environmental crisis. In another way, it is about the effects of climate change on the choice of language used in the selected novels.

Chapter One: An Ecocritical Analysis of Ian McEwan's *Solar* and Marcel Theroux's *Far North*

This chapter aims, through the application of ecocriticism, to investigate the representation of climate change and environmental degradation in Ian McEwan's *Solar* and Marcel Theroux's *Far North.* This ecocritical analysis explores the response of these two male writers to the environmental crisis and the solutions they suggest to solve it. Therefore, the analysis is based on Glotfelty's definition of the relationship between man and nature. So how do these two writers portray the relationship between the human and the nonhuman worlds?

In *Solar*, Ian McEwan shows his attitude towards climate change and environmental degradation through the depiction of a fictional world based on the present world situation, showing that the current global ecological crisis is the result of an ethical crisis while Marcel Theroux's novel is concerned, as we will see later in more details, with climate change and environmental degradation caused by industrialization. Thus, the novel transports the reader on a quest through its frozen setting, searching for the origins of humanity in a hopeful attempt to recover from its worst encroaches. Thus, this chapter seeks to answer the following question: How do Ian McEwan and Marcel Theroux present climate change and environmental degradation in these selected novels: *Solar* and *Far North*?

I- Ian McEwan's *Solar:* The Scientist's Personal Dilemma in an Anticipatory Climate Change Novel

The first selected climate change novel for this study is Ian Russell McEwan's *Solar* (2010). *Solar* is a very serious work about man's greed, self-deception and human infirmity in fighting the most pressing and complex environmental problem of the current time, climate change. In this novel, McEwan shows his views on this issue, focusing not on science as a source to solve the problem of climate change but on studying human nature as the first step towards stopping the climate issue. For him, the human mind is creative; human beings are able to create a clean energy source but the problem is in human ethics. He portrays, in his novel, a degraded environmental world resulting from human anthropocentric activities. He presents the Anthropocene as an outcome of men's immoral ethics, presenting the degradation of the outside world as a reflection of humans' inner world.

The writer also attempts to engage readers in the climate change debate and explains the limits of the existing science or the anthropocentric techno-science in offering solutions to this problem. Because of human immoral values and ethics, climate change is not only a scientific issue but also social and cultural one. As a climate scientist, Beard, in the novel is aware of the causes and consequences of climate change but he prefers to think about his personal life, denying completely his own duty and responsibility towards the environment. So, how does Ian McEwan

presents climate change and environmental degradation in this novel? To answer this question, this section aims to concentrate on both the background of the story and its depiction of climate change and environmental degradation as well as the solutions McEwan thinks humanity may adopt to solve such a problem, showing that art can help to transmit such messages and increase awareness on climate change.

To engage in environmental crisis, McEwan writes *Solar* from the perspective of Michael Beard, the protagonist of the story. A catastrophic event in the life of this character causes physical suffering and environmental degradation to the whole planet and becomes the dominant theme of the story. Moreover, in *Solar*, human beings' relationships with each other are of minor interest. Instead, relationships with the natural world are more important, and become an essential part of the story narrative. McEwan uses specific perspectives of a focalized scientific character, Michael Beard, to take actions in order to solve the problem of climate change in a "close and personal rather than distant and abstract" climate future (Nikoleris et al 307). Through the use of realistic details, the novel transfers the environmental issue from being distant and abstract to close and personal. Instead of portraying a futuristic global natural disaster and its horrifying visions, *Solar* depicts a present anticipatory moral failure of a scientist to solve an environmental problem because of his personal problems. Accordingly, the novel's actions take place in the present (or the near future) and focuses on the exploration of political, ethical and psychological problems inspired from the present day global environmental climate

change. To do this investigation McEwan portrays humans' complex relationship with the planet and raises ethical questions about human beings' responsibility in this unprecedented crisis; he employs local human relationships and behaviors as reflections of global relationships.

In "A Dirty Hero's Fight for Clean Energy: Satire, Allegory, and Risk Narrative in Ian McEwan's *Solar"* (2012) Evi Zemanek defines McEwan's *Solar* as a risk narrative because it points out the personal and professional risks the protagonist is taking throughout the story and his catastrophic management of them. He writes in this context,

> In contrast to most other novels ostensibly treating ecological crisis, McEwan's novel does not stage a dystopian future[1] or develop an apocalyptic ecological scenario that culminates in a gigantic collective disaster. Thus, there is neither a climax of delightful horror at the sight of extreme natural events, nor a personified nature taking revenge against humanity. Instead, while portraying our present situation that Ulrich Beck characterizes as "world risk society," *Solar* relies on the potential of anticipation.[2] Nevertheless, it fits well into an issue on "writing catastrophes," since it takes a disastrous course and ends in a personal, professional and financial catastrophe for its protagonist—which would not be interesting for ecocritics if it could not be read as an allegory.

Unlike most literature that deals with ecological crisis, that provides an apocalyptic environmental scenario or a dystopia, *Solar* is not set in a dystopian future nor does it foster an apocalypse for a collective massive disaster. Instead, it is a portrayal of the present risk situation of climate change and its "potential of anticipation" as Zemanek points out, in her analysis of the novel, to two risks at the level of the

protagonist. Personal and professional risks since "[it]transposes the inevitable disaster into an individual's life" (52). Zemanek, therefore, observes two catastrophes in the novel. The first is a catastrophe for the natural world; whereas, the second is a personal, professional and financial catastrophe for its protagonist. He claims that *Solar* "takes a disastrous course and ends in a personal, professional and financial catastrophe for its protagonist—which would not be interesting for ecocritics if it could not be read as an allegory" (51). For her, this is what characterizes *Solar,* "the novel's quality indeed depends on its allegorical concept, which solves a great problem of representation when one decides against dramatizing hurricanes and floods." (51) Indeed, in the novel, Beard is satirical is depicted as a morally corrupt scientist and a hypocrite who simultaneously accepts and criticizes scientific risk discourse.

The background behind the writing of Ian McEwan's *Solar* helps greatly in its analysis, especially, the portrayal of McEwan's own experience and scientific knowledge about climate change. Building on his own personal experience in 2005 as he combined a group of twenty-four well-known artists and scientists in the Arctic, McEwan took a decision "to write an 'eco-friendly' novel to witness the effect of climate change" (Javad 90). In this novel, he depicts the protagonist, Michael Beard, as undergoing the same trip to the Norwegian Arctic island of Spitsbergen, as he did himself, to tackle the issue of climate change and the contemporary efforts to fight it, using science modem history, and direct

observations of the phenomenon. In this narrative, he goes beyond the manipulation of climate change as a scientific issue and deals with it as a cultural one, believing that art, specifically, the climate change novel, can help to save the world from environmental degradation. McEwan through the protagonist of *Solar* "favours the scientific version of reality, holding that science alone can offer an objective understanding of the world" (Cojocaru 350), and people need the humanistic artful vision to grasp well the situation of the globe, which is in danger. If people continue living without considering such danger, according to him, they will not only lead to the destruction of the non-human world but to their own destruction as well. In "Prologue: Save the Boot Room," McEwan mentions climate change is the background of the story in *Solar*, and the first step human beings should follow to build a wide scientific and cultural debate over the problem of environmental degradation, is to believe that change in climate is an observable and measured fact,

> Now the facts are stark. The record shrinking of the Arctic summer ice in 2007 is one cold fact that sets simpler questions before us: Are we at the beginning of an unprecedented era of international cooperation, or are we living in an Edwardian summer of reckless denial; is this the beginning, or the beginning of the end? (xx)

Using facts and statistics makes the discussions about climate change more logical. McEwan shows how such facts about climate change have become unambiguous and observable by using an instance of the Arctic melting ice in 2007. For him, this event does teach human beings something about their duty towards the planet and the urgent necessity to take action globally to stop such environmental degradation. Denial, according to him, will certainly lead to the end, and maybe this is just the

departure of the end: “Is this the beginning, or the beginning of the end.”

To answer the previous question, McEwan states that he went along with a crew of artists, journalists, and scientists in a journey to the arctic in 2005 to witness global warming effects for the creation of new artistic productions on climate change. He joined this expedition with an art and climate change organization, the Arctic Circle called Cape Farewell, boarded to Tempelfjorden, North Pole, whose aim was to “stimulate the production of art founded in scientific research’ and to ‘pioneer [a] cultural response to climate change’ ” (quoted in William 161). He confirms that this trip was the promise to write this novel, and the goal behind it was to communicate climate change concerns,

> So, we have come to this ship in a frozen fjord to think about the ways we might communicate our concerns about climate change to a wider public; we will think about the heady demands of our respective art forms, we will consider the necessity of good science, and shall immerse ourselves in the stupendous responsibilities that flow from our stewardship of the planet. (xx)

McEwan insists greatly on communicating the issue of climate change not only to those scientists and artists who were on the boat but also to the public in a broader sense. According to him, such discussions should be raised not only to protect the boot rooms, the microcosms (small worlds), but also to save the whole planet. He writes, “We discuss our plans to save a planet many, many times larger than our boot room (xxii). To do so, he proposes that the ways human beings should start with is to reconcile between art and good science to study local environmental degradations caused by climate change and spread awareness to global audience.

Moreover, climate change, for him, is a global crisis, and solutions about it should be found because the North Pole becomes as ‘a wasteland of broken dreams’: “No one is behaving particularly badly, and certainly everybody is being, in the immediate circumstances, entirely rational, but by the third day, the boot room is a waste land of broken dreams (xxii). Unfortunately, though the goal of the Cape Farewell expedition was to tackle climate change as an urgent issue, those on the boat were not interested at all. In the same article, McEwan described them as ‘chaos,’ illustrating that what really attracted him was not the situation of the Waste land but the situation in the boot room, or in other words the human nature— the human behaviour—portrayed by those people on the boat,

> It was chaos. There was no malice, but people were careless and would inadvertently borrow each other’s stuff. Clothes and equipment there to save our lives, which we should have been able to look after very easily, would go missing, and I thought, for all the fine words and good intentions, maybe there was a comic inadequacy in human nature in dealing with this problem. (Quoted in David 176)

From the above passage, it becomes clear that McEwan’s focus in studying climate change started first from studying human nature. As stated by him, though those people on the boat were not cruel, they were ironically uncaring and chaotic to deal with the issue of climate change; each one of them caring only about his needs on the boat without caring about the others. They were on the boat for a purpose of common interest but their human nature revealed their egoism. This experienced 'chaos' led McEwan to write *Solar* to explore the human nature while dealing with

the issue of environmental degradation. “It turned out that Beard was the only scientist among a committed band of artists. The entire world and all its follies, one of which was to warm up the planet, was to their south, which seemed to be in every direction” *(Solar, Pdf).*

Believing that climate change is a human made phenomenon, McEwan suggests that the first step towards fighting it in order to rescue the planet is to understand primarily the human nature. Human beings should understand themselves first; then, they would be able to save the Earth. “But we will not rescue the Earth from our own depredations until we understand ourselves a little more, even if we accept that we can never really change our natures” ((xxii). For him, though good science can help to save Earth that is not enough. Good science should be reinforced by good rules.

Accordingly, he contends that all ‘boot rooms,’ or the microcosms, need good ecological systems to revive their creatures, even the ‘flawed’ ones so that human beings would be able to save both themselves and the Earth. McEwan, in fact, raises a very important concern about the role of art. He states in this context,

> All boot rooms need good systems so that flawed creatures can use them well. Good science will serve us well with diagnosis and prediction, but only good rules will save the boot room. Leave nothing to idealism or outrage, nor especially to good art - we know in our hearts that the very best art is entirely and splendidly useless.
>
> (xxii)

Good art and good science are not enough; the present situation of the globe needs good citizen to obey the good rules to protect the environment.

According to McEwan, learning history and the errors of the previous civilizations can also help to save the world from the crisis of climate change. He writes:

> To concentrate our minds, we have historical examples of civilizations that have collapsed through environmental degradation - the Sumerian, the Indus Valley, Easter Island. They feasted extravagantly on vital natural resources, and died. Those were test-tube cases, locally confined; when they failed, life continued elsewhere and new civilisations arose. Now, increasingly, we are one vast civilization, and we sense that it is the whole laboratory, the whole glorious human experiment, that is at risk. And what do we have on our side to avert that risk? (xix)

Thinking that the current situation of the planet needs to be solved, McEwan argues that human beings should learn from the old civilizations' collapse. He believes that the collapse of civilizations, like the Sumerian, the Indus Valley, and Easter Island, was due to environmental degradation.

In addition, McEwan thinks that imposing international laws would be beneficial to help to put an end to this problem: "The wide view from the airplane suggests that whatever our environmental problems, they will have to be dealt with by international laws" (xx). Without such international laws and global interest to solve the environmental crisis, no nation is ready to limit its industry if the others do not do; all should be engaged to act accordingly. He writes in this context "No single

nation is going to restrain its industries while its neighbours' are unfettered. Here too, an enlightened globalization might be of use" (xx). To do so, he evokes the possibility of linking rationally science with law. Such a link may lead to a collective solution concerning climate change effects:

> There has probably never before been a problem that was so wholly reliant for a solution on the apparently disparate fields of science and law. Of course, their common thread is, or should be, rationality. Good international law might need to use not our virtues, but our weaknesses (greed, self-interest) to leverage a cleaner environment; in this respect, the newly devised market in carbon trading is a good first move. (xx)

Accordingly, and starting from McEwan's point of view about the relationship between climate change, science, and law, it is worth analyzing his position towards climate change in his literary works, mainly *Solar*. Thus, this section will endeavour to answer questions like: how does McEwan set the relationship between science, art and climate change in his novel? In other words, how does he apply his own perspectives about climate change in a literary imaginative work? Does he create a new form of a novel or does he adopt the traditional form?

Solar deals with nine years of the life of Michael Beard, a well-known Nobel science prize winning physicist. It explores human behavior through the depiction of the character of Michael Beard, who represents the worst of humanity in terms of, greed, self-interest, and unreliability. After he realized an international fame, Beard is fifty-three years old now. However, trapped in a spiral of his domestic and professional decline, he has lost interaction with his research area and has become no

longer interested as earlier in the natural sciences, more precisely, in photovoltaics and artificial photosynthesis researches. From the opening of the novel, the narrator describes him in an ironic and negative way,

> He belonged to that class of men - vaguely unprepossessing, often bald, short, fat, clever - who were unaccountably attractive to certain beautiful women. Or he believed he was, and thinking seemed to make it so. And it helped that some women believed he was a genius in need of rescue. But the Michael Beard of this time was a man of narrowed mental condition, anhedonic, monothematic, stricken. (*Solar, Pdf*)

The narrative, then, tracks both the private and professional life of Michael Beard ,in a chronological order, portraying him in three important stages of his life, in 2000,then in 2005 and finally in 2009.

These periods are full of unwise consuming strategies interspersed with some memories of his Oxford student days. Each period in Beard's journey in the novel is set in a particular symbolic place that helps McEwan write about climate change: London, the Artic Pole, and the desert in New Mexico; the same places McEwan himself visited in his journey to the Arctic. Thus, Beard goes from London, to the Artie Pole, up to the desert in New Mexico. He describes these places through interior monologues and "lives these places mainly through their non-places: planes, airports, comfortable chain hotels or increasingly bigger cars running on motorways" (Bolchi 36).

Beard's story starts in 2000, where the author gives a full image of the

consuming life of this scientist, who is socially supposed to be in the front for saving the world from any anticipated catastrophe that climate change may cause. The novel starts with Beard's fifth marriage failure with Patrice, who is having an affair with their builder, Rodney Tarpin,

> His fifth marriage was disintegrating and he should have known how to behave, how to take the long view, how to take the blame. Weren't marriages, his marriages, tidal, with one rolling out just before another rolled in? But this one was different. He did not know how to behave, long views pained him, and for once there was no blame for him to assume, as he saw it. It was his wife who was having the affair, and having it flagrantly, punitively, certainly without remorse. He was discovering in himself, among an array of emotions, intense moments of shame and longing. Patrice was seeing a builder, their builder, the one who had repointed their house, fitted their kitchen, retiled their bathroom, the very same heavy-set fellow who in a tea break had once shown Michael a photo of his mock-Tudor house, renovated and tudorised by his own hand, with a boat on a trailer under a Victorian-style lamp post on the concreted front driveway, and space on which to erect a decommissioned red phone box. (*Solar, Pdf*)

The narrator also shows Beard's financial difficulties because the money he gains from his work are not sufficient to satisfy his needs. However, after having this colliding between his professional and personal life, Michael Beard is lucky to have the opportunity to rescue himself from his spousal chaos and revive his career again by receiving an invitation from governmental authorities to lead a mission to the Arctic. Like McEwan in real life, Beard is engaged to make this journey to the North Pole to 'see global warming for himself' (*Solar, Pdf*). During the mission, he also accepts to become the head of the newly founded British National Centre for Renewable Energy in Reading, New Mexico. This mission offers him a lot of money and a wide popularity in a short time without making any effort from him.

In the research center he has been appointed to lead, they are supposed to develop a project named ‘Wind Turbine for Urban Domestic Use,’ abbreviated as WUDU that seeks to harness wind energy: “engaged with climate change and announces a number of initiatives which one of them is the Centre” (*Solar, Pdf*). There, he is supposed to make a research about this issue in terms of science and art and find a solution to the problem of climate change through the creation of a clean energy source,

> Though he won a Nobel science prize for his ‘Beard-Einstein conflation’ theory -- the details of which are left suitably hazy -- ‘decades have passed since he last sat down in silence and solitude for hours on end, pencil and pad in hand, to do some thinking’ ..... Instead he has coasted through the remainder of his career via reputation alone, achieving very little work. (*Solar, Pdf*)

Because of his circumstances, Beard accepts this invitation to gaining easy money without having any intention to construct electricity through artificial photosynthesis, thinking that the money he gains from university and media appearance are unsatisfactory. Beard's self-interest leads him to accept the invitation without caring for common good or interest.

In the mission assigned to him, Beard is required to find a solution to stop climate change and improve the current situation of environmental degradation by inventing a clean energy source. During his different car journeys, Beard shares ideas on climate change and the solar energy project with his car driver, Tom Aldous, a young post graduate researcher working at the National Centre for Renewable Energy, a government research establishment dedicated to tackling

climate change led by Jock Braby. Trying to speak to Beard about the potential of solar energy, Tom Aldous is shut down by Beard, who seems unenthusiastic about the project.

After returning home early from his trip one day, Beard thinks that his wife Patrice is cheating on him with Rodney Tarpin and decides to divorce her, but he discovers that Patrice betrays him with Tom Aldous as well. When confronting Aldous, the latter begs him on his knees not to kick him out of the center and not to steal his work, thinking that his research about photosynthesis and solar energy is more important. However, he slips off the polar bear rug and hits his head on the glass table and dies. Beard sizes the opportunity of Aldous's death to take revenge from Tarpin as well. Thus, instead of calling the police and being blamed for the death of the young man, he traps Tarpin as the murder of Tom Aldous and steals his work, which is a genius idea based on artificial photosynthesis used to stop climate change, and appropriates it as his own work. Therefore, Tarpin is imprisoned; whereas, Beard is portrayed in the media as a sympathetic figure who was cheated by his wife. In addition, Tom Aldous’s research on solar energy is labeled by his name, and he becomes famous as an eco-friend to nature who introduces a speculative artificial photosynthesis to capture the CO2 of the atmosphere and produce green energy.

The narrative, then, develops five years later, in 2005. Beard passes off Aldous's work as his own, and implements the artificial photosynthesis project. He also divorces his wife, Patrice, and starts he starts dating a thirty-nine years old girl called, Mellissa. However, things get complicated when Melissa becomes pregnant intentionally and without his knowledge. The third part of the narrative begins in 2009, when Beard is about to realize his project of solar energy. He becomes older, sixty-two years old, but this time he has a daughter of three years old with Mellissa, named Catriona. Beard, however, is a womanizer and is in a relationship with another woman from New Mexico. At the end of the story, everything falls apart in the life of Beard, leading to the collapse of both, his private and professional lives. After giving a press conference in which he confirms that the lack of women in science is due to the natural limitations of their gender, he is fired and no longer works for the government. His solar project fails because of plagiarism. This causes a media storm and his womanizing past is posted in the press. Furthermore, he suffers from skin melanoma. At the close of the narrative, while Darlene, the woman from New Mexico, plans to marry Beard, Melissa comes to New Mexico with Catriona to talk about their future. All these events occur to leave the novel with an open ending.

Along the three periods narrated in the novel, Beard is under constant test: Since ecocriticism investigates human's attitudes and reactions towards nature, the aim, here, is to investigate Beard's relationship with the non-human world.

McEwan's treatment of this main character is very important because he communicates the issue of climate change through him. Therefore, the analysis of climate change in this novel is based on the analysis of Beard's ironic and antiheroic actions and positions, which are central to the novel since they reflect generally human beings' responses to the environmental crisis. As a scientist, does he accept such alarming facts concerning climate change? How does he react? Do his faults and weaknesses have any impact on his decisions? At the end of the story, does he learn something from the laboratories and scientific knowledge he has been exposed to?

The ecocritical analysis of the novel reveals that the way McEwan presents climate change and environmental degradation in his novel, *Solar,* is very different from other literary depictions. Through *Solar,* McEwan realizes one of the most important promises of the postmillennial British novels which is as suggested by Astride Brake, "participate in the construction of new narratives, providing alternatives and new ways of making sense of crisis" (Brake 4). In *Solar,* McEwan does not only reflect conceptions about climate change but he also succeeds to give rise to a new form of a novel to tackle this issue and presents it in a different way. He sets his novel in the present to give an image of the current situation of Earth, suggesting, thus, an anticipatory tone to prevent the occurrence of a calamity that climate change may cause.

Setting a climate change story in the present is a new trend in science fiction in general and climate change fiction in particular, contrasting totally the other literary depictions of eco-fiction because eco-fiction tends to be set in the post-apocalyptic future. Through the use of the present vision, McEwan assumes that climate change is not only a scientific discourse; rather, it has led to a 'green crisis,' which "is a widely cultural issue," (Cojocaru 351). Instead of employing science fiction imagery, the novel is based on real facts, implying that the most important anxiety of the novel lies in how scientific knowledge may offer a means of understanding climate change. In addition to creating a new type of settings, McEwan has added another innovation to the field of eco-fiction. In the novel, he discusses this serious ecological problem in an ironic way. He mixes comedy with environmental issues to be able to construct a new form of novel, "a climate change comedy" (Tate 5). To do so, he uses the implied narrator, a narrator in the mind of a scientist. Indeed, McEwan communicates the issue of climate change in an ironic way through an expert scientific fictional character, Michael Beard. He presents it through his encounters: what he sees; what he hears; what he knows; what he thinks, and how he acts. Other people are known only through their locations. Bc. Lucia Tupa states that McEwan "utilises the first-person narrative of that observant scientific mind, enabling the main protagonist to analyze his surroundings with minute attention to detail" (26).

The novel centers on Beard's follies in the workplace and at home. Through his conversations, perspectives, and selfishness, his personal and ethical dilemmas are revealed. Thus, he becomes the allegorical and archetypal character that presents humanity's greed for selfish over-consumption, portraying his 'flawed creature' and "destructive human nature" (David 177). Though this scientist was "a passive (but skeptical) supporter of mitigating climate change," later he "[became] an advocate of large-scale investment in renewable energy technologies," but they "are delayed because of personal greed and pride, as well as the lack of economic incentives to invest in renewable energy" (Nikoleris et al 310-11). Beard pretends to combat climate change through the creation of a clean energy source which is solar energy, but at the end, he fails to do so because he should first fight his greedy self before fighting global warming. In "Writing Derangement: Climate Change and the Novel," Amy Howden-Chapman considers that McEwan endows the protagonist of *Solar,* Michael Beard, with 'arrogance,' 'grandiosity,' and 'belligerence,' the characteristics of "a culture unwilling to prevent catastrophe" (61). Moreover, he states that McEwan sets the problem of climate change in a distanced geographically and socially region (62). According to him, climate change in *Solar,* is depicted through the presentation of climate knowledge and the effects of climate change before any catastrophic calamity takes place. Furthermore, he asserts that *Solar* is a parody, a satire of Beard, who is a scientist, seeming to be not like any other scientist or to think like any other scientist. Although he is a physicist who attends lectures

and conferences and who knows very well the language of data and calculations, he has poor conscience and ethical responsibility towards climate change.

Having scientific knowledge, for McEwan, is not enough, and people should be aware about the issue of climate change and their responsibility in taking actions to fight it. In *Solar*, Beard, who has been designed to help solving this environmental degradation, defines climate change as "the hot breath of civilization (*Solar, Pdf*), confirming the fact that human beings are the cause of global warming and the crisis of climate change in general. Astrid Bracke in her book, *Ecocriticism and the Contemporary British Novel*, states,

> While he presents himself as a champion of renewable energy throughout much of the novel, he also comes to personify contemporary Western consumerism: Beard is insatiable, always wanting more money, more food and more sex. Or, as one reviewer of the novel puts it, Beard comes "to embody just about everything that has brought about the climate-change crisis in the first place: greed, heedlessness and a wilful refusal to think about consequences or the future" (Kakutani 124)

She also notes that two ecocritical promises appear in *Solar* which are the importance of climate change as a theme in the novel, and secondly the notion that art can make a difference in fighting climate change.

Accordingly, the first ecocritical promise in the novel lies in McEwan's belief that climate change is a real environmental problem, but people deny it and remain skeptical; even their attempts and decisions to solve it remain unworkable.

According to him, science alone is not enough to put an end to this environmental crisis. Through Beard, McEwan explores the nature of the relationship between the scientist and the natural world, trying to manifest his role in the age of climate change. Beard wants to rescue the world from a climate change calamity while symbolizing "all the planet spoiling habits that people develop." This helps the writer "debunking current scientific myths and cliches and of voicing his concern with the metanarratives that they generate, with the dangers of conflating fact with fiction and building a whole scientific project on deceit" (Cojocaru 346). Cansu Ozge Ozmen, on the other hand, maintains, "The protagonist's conspicuous consumption of romantic entanglements also mirrors the daily routines of billions of human beings in overconsumption of commodities and non-renewable planetary resources" (1).

An attentive look at the events of the first part of the novel leads to deduce that this scientist lives in a dilemma; he is not interested in the data registered about the danger of climate change. His only source of interest is his own personal life: wives, foods, drinks, and all what represent the twenty-first century consuming culture. Although he is a scientist and has wide knowledge about science, he ignores public spheres' culture. His lack of culture has led to the failure of his personal, social, and professional life. The novel's first part, accordingly, presents Beard's trip to the Artic, as not "[braving] the harshest conditions in order to see for himself"

(*Solar, Pdf*) but rather to a list of commodities he would enjoy there,

> he would be staying on a 'well-appointed, toastily-heated vessel of richly-carpeted oak-panelled corridors with tasselled wall lamps', so a brochure promised, on a ship that would be placidly frozen into a semi-remote fjord [...]. The three harships would be the size of the cabin, limited email opportunities, and a wine list confined to a North African *vin de pays.* (*Solar, Pdf*)

Adam Trexler and Adeline Johns-Putra contend that *Solar* is different from the other climate change novels since it emphasizes on climate change as the result of an ethical dilemma rather than any other catastrophic events. They write that *Solar,*

> is also distinctive in its emphasis on climate change as an ethical dilemma for the present rather than environmental disaster set in the future; as we have suggested, the majority of climate change fiction uses climate change as a setting (although it also may deal with its implications through characters and plot. (9)

McEwan investigates the ethical nature of the scientist in the age of climate change, where the relationship between him and the natural world is totally unimportant. Beard's dilemma starts first because he ignores himself and his inner flaws and weaknesses. He has to know about himself to be able to face the outside world and propose solutions to it. Unfortunately, Beard is skeptical about climate change. He is a denier to this environmental problem. He does not care about reducing the effects of climate change. All he does is having tedious conversations about it:

> Beard was not wholly sceptical about climate change. It was one in a list of issues, of looming sorrows, that comprised the background to the news, and he read about it, vaguely deplored it and expected governments to meet and take action. [...] But he himself had other

> things to think about. And he was unimpressed by some of the wild commentary that suggested the world was in 'peril', that humankind was drifting towards calamity, when coastal cities would disappear under the waves, crops fail, and hundreds of millions of refugees surge from one country, one continent, to another, driven by drought, floods, famine, tempests, unceasing wars for diminishing resources. (*Solar, Pdf*)

Beard cannot even distinguish between crickets from cicadas: "Even in the denatured neon glow of the Lordsburg mini-strip, the crickets or cicadas - he did not know the difference - went on singing. There was no money in stopping them. And no means of preventing or franchising the neatly etched half-moon that hung above the gas station" (*Solar, Pdf*)

However, despite his skepticism about climate change, the narrator indicates that Beard,

> was unimpressed by some of the wild commentary that suggested the world was in peril, that humankind was drifting towards calamity, when coastal cities would disappear under the waves, crops fail, and hundreds of millions of refugees surge from one country, one continent, to another, driven by drought, floods, famine, tempests, unceasing wars for diminishing resources. (*Solar,Pdf*)

Moreover, Beard criticizes and rejects the idea assuming that there exists an actual global environmental crisis so doubtfully that he believes that there is no need for this solar energy: 'Solar energy?' [...] He knew perfectly well what was meant, but still, the term had a dubious halo of meaning, an invocation of New Age Druids in robes dancing round Stonehenge at Midsummer's dusk. He also distrusted anyone who routinely referred to 'the planet' as proof of thinking big (*Solar, Pdf*). However,

McEwan is confronted with sequences of scenarios that will take place if climate change is not stopped, he is still skeptical, "[he] had heard these predictions before and believed none of them. And if he had, he would not have been alarmed" (*Solar, Pdf*).

Seyed Javad Habibi in his article, "Incredulity towards Global-Warming Crisis: Ecocriticism in Ian McEwan's Solar," writes that while trying to tackle climate change concerns and the dilemma surrounding it, *Solar*, as an ecofiction work, tries to highlight ethical issues stimulated from human interactions with the non-human world. Through this work, McEwan wants to express that the cause of environmental degradation is the collapse of moral values. Dealing with ecology, he aims to transmit his messages not only to literary readers but also to all other kinds of readers to show them that such environmental crisis is a human-made phenomenon; human beings have destroyed nature because of their selfishness. In his early work, McEwan's has focused on discussing microcosmic issues, but, in *Solar*, he has manipulated a macrocosmic issue. Javad explains in this context:

> Not just a typical novelist who only depicts the beauties of man and nature, McEwan is obsessed with the beauty that may emerge out of the abstract realities of the fundamental natural laws and logical propositions and mathematical equations. His extensive use of mathematical or other scientific jargons such as logarithmic complexity, variable, ratio, magnitude, fraction, angles, equilibrium or gradient in *Enduring love* demonstrate his engrossment with "a state of mathematical grace" (McEwan 1997, p.3). The same predilection is an idiosyncrasy in Michael Beard's character when he remarks (93)

Through the use of irony, McEwan portrays Beard as a flawed character, "the exclusive focal point of the novel," (Ashton-Smith 132) fails in all his marriages despite his wealth. Beard himself comments on himself that he is "neither observant nor sensitive" who "would have been the first to concede that he had never quite got the hang of brotherly feeling", considering virtue to be "too passive, too narrow [...] a weak force" . Yet, Beard has got the faults that any human being can possess, faults that have originally stemmed from the surrounding twenty first century society overconsumption.

In *Solar,* McEwan criticizes human beings' current unethical relationship with the environment, suggesting that human beings should make a moral revolution to solve this problem and save the world. The protagonist of the novel, Michael Beard, fails to solve the problem of climate change because of his immoral values towards the universe although he is a scientist. The debate over climate change is reflected through Beard, who shows his criticism towards this issue. Beard admits that there are "other things to think about [and being] unimpressed by some of the wild commentary that suggested the world was in, peril" (*Solar, Pdf*). He does not care about the extinction of human species because he thinks the "biosphere would soldier on, and in a mere ten million years teem with strange new forms" (*Solar, Pdf*). He is an irresponsible scientist who does not care about the human and the non-human world. The survival of nature and other living creatures is the least of his

concerns, and his carelessness is portrayed in the disaster in his personal life:

> This character is willing to come up with a partial solution to global warming only as part of his business project; his own scientific mind is not subject to a rigorous scepticism inherited from the Enlightenment, but rather to pure personal profit inspired by the period of *laissez-faire* capitalism. Instead of facing problems he is permanently running away from them. (Beran 127)

Bear's disinterest in climate change is evident from the first part of the novel. He is constantly opposed by Tom Aldous who cares about the future of the planet, thinking that the "planet is in danger" (*Solar, Pdf*).

Beard's self-interest allows him to plagiarize and steals the notes of this junior colleague, Tom Aldous, who chases solar energy as the clean alternative energy source without any kind of remorse. In *Ecocriticism on the Edge: The Anthropocene as a Threshold Concept,* Timothy Clark states,

> The central move of the plot is that Beard has stolen a crucial invention, artificial photosynthesis, from a colleague, Aldous, who died before making it public. Trexler argues that the way this material invention is so central to the plot drives the novel beyond the conventions of 'literary realism' into something new which he nicknames 'scientific realism.' (180)

This incident is very important in the novel; it affects strongly the move of the narrative from Beard's detailed life to the major theme of the novel, which is climate change. Here, climate change becomes of interest to Beard. He becomes interested in applying the artificial photosynthesis project and designing a full-scale power plant only after Aldous's accidental death.

In fact, Beard's encounter with Aldous reminds him of his past and his neglected career; it is also a reminder of the awaiting ecological crisis, because it illustrates how disaster can come from the neglect of other creatures and the Earth we all share (Hsu 331). McEwan's creativity helps him to create an innovative comic climate change work through the invention of 'scientific realism.' Through *Solar*, McEwan depicts Michael Beard as an immoral scientist who takes the opportunity to use the publicity surrounding climate change for him, highlighting his selfish and environmental irresponsible lifestyle (Clark 180). Beard's self- absorbed and narcissistic nature and his ethical transgressions have led to a catastrophic experienced by all the end of the novel.

McEwan, in *Solar*, has kept his promise of using the power of imagination and, narrative to open the debate about climate change, and present a literary work that illustrates different views and their perspectives about climate change. He has also succeeded in answering the question of whether art can play a role in combating climate change, presenting a serious view of the function of art in a time of environmental crisis. Through Beard's trip to the Arctic pole, McEwan starts questioning and exploring the role of art in this environmental crisis, or in other words, the role of culture to present and discuss this extremely scientific and abstract issue and the multiple political and economic decisions that can be taken about it. The description Beard makes on the boat to those artists show his criticism that art

can have an impact on the climate change debate: “Such was the music and magic of ship-bound climate-change talk” (*Solar*, *Pdf*). For him, artists are not able to present scientific ideas and cannot make any contributions in ‘cultural debates.’

Rather than being described as an enlightening experience, the Arctic expedition is ironically identified as a party that seems to have been prepared only for the entertainment of these artists and scientists, whose primarily concern is not climate change, but any other kind of pleasure. Stressing that human beings cause the wasteland in the environment , Beard, the only scientist in the trip, does not only criticize the belief that art can motivate far-reaching change, but he also admits that he cares a little for art and is amazed at finding himself aboard a ship full of artists on an Arctic expedition. He is particularly surprised by their belief that their work can actually make a difference.

Meredith is used as McEwan’s own voice who along the whole story, tackles the issue of the influence of literary narrative in changing world views about climate change because both characters, Beard and Meredith, are opposite to each other. While Meredith believes in the validity of art to raise environmental awareness, Beard contradicts him, and expresses his doubt that art can play such a role because he believes that environmental awareness can be obtained only through science, the only source that can provide an objective view to solve the problem of climate

change. Throughout the story, there is a journey to check the validity of each one of the two assumptions: Beard's method is a scientific one while Meredith claims for the use of art. In their first meeting, Beard calls Meredith, "gangling novelist... with rimless glasses" (*Solar, Pdf*).

Meredith, however, expresses his own view about the validity of art in fighting climate change, to play a role in the climate change debate by stating:

> Heisenberg's Uncertainty Principle, which stipulated that the more one knew of a particle's position, the less one knew of its velocity, and vice versa, encapsulated for our time the loss of a 'moral compass', the difficulty of absolute judgements. (*Solar, Pdf*)

Through this statement, Meredith suggests the applicability of scientific methods to clarify ethical situations, imitates the compatibility of scientific approaches to ethical and literary discourses. By this, McEwan's use of this scientific approach is to invalidate the claim that science is superior in solving problems, such as climate change, and that art too can play a big role to do so, insisting on the ability of literature, even in its satirical form , to make the world conscious about this man-made, environmental catastrophe. However, Beard disagrees with him. He tries to correct him by arguing that: "What was at issue was not velocity but momentum, in other words, mass times velocity. At such hair-splitting there were muted groans" (*Solar, Pdf*) because he believes that "the principle had no application to the moral sphere. On the contrary, quantum mechanics was a superb predictor of the statistical

probability of physical states" (*Solar, Pdf*).

However, Beard thinks in a completely different way. He does not believe in the capacity of anyone, even less the artists , painters , and writers to save the planet. The narrator tells the readers:

> Beard would not have believed it possible that he would be in a room drinking with so many seized by the same particular assumption, that it was art in its highest forms, poetry, sculpture, dance, abstract music, conceptual art, that would lift climate change as a subject, gild it, palpate it, reveal all the horror and lost beauty and awesome threat, and inspire the public to take thought, take action, or demand it of others. (*Solar, Pdf*)

What is noticed at the end of the novel is the failure of Beard's scientific method because of his immoral values. Through Meredith, the novel proposes a meta-fictional dimension to criticize McEwan's own profession, mainly his use of science in his works.

Solar tells a story within a story, at an energy conference, Beard meets Jeremy Mellon, who is "interested in the forms of narrative that climate science has generated. It's an epic story, of course, with a million authors" (*Solar, Pdf*). Beard immediately disbelieves Mellon, saying, "People who kept on about narrative tended to have a squiffy view of reality, believing all versions of it to be of equal value" (*Solar, Pdf*). He explains that narratives are not real versions of events because a novelist can add and omit details to suit the audience. To illustrate this, he uses an example of a narrative made by Tom Aldous as an attempt to convince him about the

use of solar energy to fight climate change:

> There's a guy in the forest in the rain and he's dying of thirst. He has an axe and he starts cutting down the trees to drink the sap. A mouthful in each tree. All around him is a wasteland, no wildlife, and he knows that thanks to him the forest is disappearing fast. So why doesn't he just open his mouth and drink the rain? Because he's brilliant at chopping down trees, he's always done things this way, and he thinks that people who advocate rain-drinking are weird. That rain is our sunlight. (*Solar, Pdf*)

Beard uses the same narrative in a conference lecture, but he makes a slight difference that leads to a totally new meaning; he modifies it through adding some details to outfit a given purpose. Instead of saying: "a few mouthfuls in each tree," he says: "a mouthful" (*Solar, Pdf*). The aim behind Aldous' story differs from Beard's; Aldous tells the story to convince Beard that "the planet needs to be saved - not that money was to be made." He states:

> "Imagine we came across a man at the edge of a forest in heavy rainfall. This man is dying of thirst. He has an axe in his hand and he is felling the trees in order to suck sap from the trunks. There are a few mouthfuls in each tree. All around him is devastation, dead trees, no birdsong, and he knows the forest is vanishing. So why doesn't he tip back his head and drink the rain? Because he cuts trees expertly, because he has always done it this way, because the kind of people who advocate rain-drinking he considers suspicious types."That rain is our sunlight. (*Solar, Pdf*)

However, Beard sees is as potential financial gain. "[c]olossal fortunes will be made" (*Solar, Pdf*)

The other perspective McEwan rises concerning the role of art in the current debate of climate change is that ideal art becomes a means for commercial benefit.

This is well portrayed with another artistic character, Stella Polkinghorne, who creates a life-sized Monopoly set, signifying how artistic messages are damaged by economic factors and accidental consequences,

> He had been sent biographical notes and pictures of his fellow guests on the frozen fjord and been struck by the smile of a certain conceptual artist whose name, Stella Polkinghorne, was familiar, even to him. Her most recent media storm involved an accusation of an infringement of copyright that had never come to court. She had constructed for the Tate Modern a scaled-up Monopoly set on a playing field in Catford, each side of the painted board a hundred metres long, a space one could stroll about in, with near-life-sized houses on Park Lane and the Old Kent Road, accommodation one could enter to observe an unequal distribution of wealth. In the empty homes of the Mayfair rich, tapestries, woodcuts by Durer and discarded champagne bottles, while down the Old Kent Road, among the East End poor, junk-food wrappers, discarded syringes, a TV playing soaps. The dice were two metres high, the Community Chest cards were lowered in place by crane, the dog-eared banknotes made of plywood were in tottering 25-metre piles on the grass. In all, an indictment, it was supposed, of a money-obsessed culture. *(Solar, Pdf)*

By illustrating the collapse of an energy scientist and the danger facing his consumerist society, readers may discover the reasons behind the failure of human beings to mitigate climate change. On Paddington station, Beard discovers:

> First, that in a grave situation, a crisis, we understand, sometimes too late, that it is not in other people, or in the system, or in the nature of things that the problem lies, but in ourselves, our own follies and unexamined assumptions. And second, there are moments when the acquisition of new information forces us to make a fundamental reinterpretation of our situation. Industrial civilisation is at just such a moment. We pass through a mirror, everything is transformed, the old paradigm makes way for the new. *(Solar, Pdf)*

Reasons are illustrated by the two ecocritical promises that the novel explores. In a time of climate change, do people believe that this is a real environmental problem

and they should act to stop it or they just choose to remain deniers? Can art play a role to convince people to take real actions to stop it? Therefore, this fictional character provides readers with possible ways to think about climate change and imagine "different kinds of future societies and personal transformations" ((Nikoleris et al 317). Such literary scenarios' transformations "may thus affect engagement with climate change as an issue through those subjective encounters and create space for personal reflections; why should I (or we) care about climate change, how does it affect me, and what should be done about it? ((Nikoleris et al 317). Instead of advocating science and technology as a solution to the ecological crisis, McEwan, tries to give much more importance to ethics; he sees that human beings should face their own selves to be able to face the outside world courageously and attentively. Beard's life, marriages, work and social position are all in crisis.

The collapse of Beard reflects the collapse of all human beings. Through *Solar,* McEwan gives "an image of the devastated near future of the world if a real, practical decision fails to be made" (Javad 93). He tries to reveal "the cause of the impracticality and unreality of many decisions made in various international summits to suggest the possible effective solution. Neither Beard nor his society has a future because selfishness prevents them from loving others, including children" (Shu 337).

To conclude, though McEwan's novel, *Solar,* has received severe criticism, such as being communicated just by one scientific voice, it is viewed as a

considerable attempt to tackle the issue of climate change in literature. It is an encouraging step towards the writing of other fiction that might help solve the problem and engage readers to take actions not only at political levels but also in daily life routines. The whole novel is an allegory about the greed of humans, selfishness and over-consumption, and the role they should play to save the planet from environmental degradation. Beard could not save the world because his opportunistic because of his selfish traits and selfish motives.

Solar is considered as a call to think about the human ethics towards the non-human world, where people are required to face the truth about themselves and then the truth about their environment. This is well portrayed through Beard whose artificial actions towards the planet end in his own catastrophe. The consequences of this inaction appear at the end of the work. McEwan shows through Beard that scientific knowledge is not enough to solve the problem, and human beings should know themselves well; then, they can be able to solve such a problem that has originated from their shortage, egoism and self-interest.

The collapse of Beard's life resembles the collapse of all humans who should think well about their relationship with their natural environment. Being egoistic and self-centered complicate the situation of solving the problem of climate change. Through Beard, McEwan transmits an indirect message to his readers, even the non-scientific ones. If climate change continues in this speed and human beings do not

take workable actions, this will definitely lead to an environmental disaster, which is portrayed in the novel through the collapse of Beard; meaning that the collapse of nature leads ultimately to the collapse of human beings. Therefore, readers should even discover the hidden meanings McEwan does not show explicitly. However, there is hope; if human beings believe that they are the principle and only cause that has led to this environmental crisis and its aftermath results, they will be able to solve the climate change problem. Through *Solar,* Ian McEwan tries to reveal human nature through the character of Beard, and the reader is given an active role to learn from the experience of Beard, a human being whose flawed characteristics over nature have led to a personal calamity.

Ian McEwan's concern in *Solar* has not been to deal with the causes that have led to climate change; rather, he has dealt with its effects on individuals and their loss of ethics. He has presented this phenomenon through the protagonist, Michal Beard, as a flaw scientist and an opportunist character whose aim has not been to solve the problem of climate change but to benefit from it in order to realize his self--interest objectives, indicating that the effects of climate change have led to the collapse of the individual in his society. Through *Solar,* McEwan insists that scientific data and calculations are not more important than facing the truth of the current crisis of climate change and taking one's actions towards it. It is not too late for individuals and the world in general to take such actions. There is still hope to

take care of the Earth and solve the problem of the ecological crisis. All countries should take part in this action. Talking about the future of Earth is talking about the fortunes of all humanity regardless to nationalities and religions. Briefly, the main lesson learned from the novel is the solution McEwan, as a scientist and a humanist, proposes to the world to solve the problem of climate change now, in this present time. If things do not work well concerning climate change sustainability, a disaster would happen. Marcel Theroux answers the whole world in his novel, *Far North,* by giving an apocalyptic vision of the world if such an environmental catastrophe takes place.

II- Social Collapse in Marcel Theroux's *Far North*

The second novel of interest in this study is Marcel Theroux's *Far North,* an alarmist novel about the effects of climate change and environmental degradation. Sharing with McEwan the same anthropocentric view concerning climate change as a human-made phenomenon that needs to be solved, Theroux deals with this issue from a different perspective. So what is *Far North's* narrative? And how does Marcel Theroux present climate change and environmental degradation in this novel?

Marcel Theroux's *Far North* is one of the most recognizable works in climate fiction, the newly developed subgenre in science fiction. It is estimated by Mark Nuttall et al in "The Arctic in Literature and the Popular Imagination," as a dystopian story that deals with the effects of climate change and aims to stop global warming.

They state:

> A recent development is so-called cli-fi, or climate fiction, usually dystopian stories about the effects of and attempts to halt global warming. Instalments range from realistic fiction like Ian McEwan's *Solar* (2008), referencing modern history and science and partly set in Svalbard, to the Siberian western of Marcel Theroux's *Far North*. (53)

According to them, these set of novels are different from the late nineteenth and early twentieth centuries' utopian novels in terms of setting. Instead of using alternative worlds, they use the arctic as the setting to show virgin lands "under threat" of climate change (53).

Theroux' novel, *Far North*, is set in Siberia where climate change has removed the majority of the world's population. It tells the story of the protagonist, Makepeace Hatfield who is the narrator of the novel. Makepeace is considered as one of the last survivors of an American settlement situated in a Russian Arctic area famous as Far North whose survivors are mainly tribal groups or slaves. Makepeace's father travelled from the noisy cities in America to settle down and live in the Siberian wilderness. Therefore, Makepeace has to make a journey and see what is left in other places, searching for remaining of human civilization or as she alters: "My heart lifted to have left the last of so-called civilization behind me" (*Far North*). While doing so, she keeps her books for the future generation and preserves the guns in good repair though she is left alone and knows that no one is will ever read them.

After Makepeace meets Ping who is pregnant, she befriends her and becomes very hopeful and ready to help her raising her child. Unfortunately, Ping dies with her newborn child. Thus, she loses hope and decides to drown herself. While trying to do so, she sees an aero-plane flying overhead and suddenly crashes. The aeroplane carries Eben Callard, her previous enemy who raped her with a group of men when she was a teenager as revenge against her father. Makepeace considers the accident as a sign of hope that there must be civilization somewhere. She says:

> I'm not superstitious, but I took it as a kind of sign, from god, or the gods, or the ancestors, or whoever is up there, not to abandon myself to my despair. It does seem strange to take comfort from death and disaster, but the appearance of the plane in the sky told me I was no longer alone. The people who flew in her had died, but I knew she must have been built somewhere, that someone had fuelled her, prepared her for her journey through the air. (*Far North*)

Therefore, she rides her horse to see the remaining of this civilization as the aeroplane gives her hope to start searching again. "I took a sliver of blackened wing from the wreckage and made a keepsake out of it, working it into a tiny cross and wearing it on a string round my neck. From the depth of my sadness about Ping arose a new hope in the shape of that plane" (*Far North*).

Unluckily, while Makepeace attempts to continue her life and realize her aim, she arrives at Horeb, the first community she finds, settled by the Hobbesian, and led by Reverend Boathwaite. Though she decides to help this community by providing food, they imprison her and sell her later to a slave camp led by Eben. The enslaved workers have been asked to harvest the place's lost technologies hoping to

discover and retain again human civilization. The camp is situated near a toxic and dangerous place called ‘the Zone’ that had formerly been a great city. In this working camp, she spends five years as a slave to be elevated later to a slave guard status. This gives her the opportunity to escape to the Zone. Finally, Makepeace kills Eben, taking her revenge, and returns to her original settlement, the Quaker, which is now uninhabited. At the end of the novel, she gives birth to her daughter, reflecting her hope for a better future within this unraveled world.

Marcel Theroux in *Far North* deals with climate change and environmental degradation in an explicit way; he uses climate change as the setting of the story. He depicts a post-apocalyptic world caused by climate change and environmental degradation. He imagines that an ecological disaster will take place in the near future as a result for this environmental crisis, warning readers that this disaster may occur unexpectedly and eminently causing the collapse of human civilization and the loss of the human species.

Theroux presents climate change and environmental degradation in terms of the climate change’s settings themselves, meaning that he imagines what will happen to nature if this phenomenon continues to occur. While McEwan summarizes the effects of climate change in the destruction of the individual in society, Theroux extends it to the destruction of the whole society. Theroux does not mention any knowledge about the origins of the catastrophe. Instead, his presentation of this

environmental problem is portrayed in terms of losses. Makepeace is confronted in her journey to find a civilized city to a series of losses: loss of the land, loss of civilization, loss of human beings, and loss of language. Through Makepeace, the reader learns, feels, and experiences life in such a world if environmental catastrophe takes place.

In "What Will They Do Tomorrow? Post-apocalyptic Fiction and the Social Contract" Claire Curtis explains Theroux's aim behind the journey Makepeace makes in the novel. He states,

> Marcel Theroux's *Far North* follows a woman whose family has resettled as Quakers in Siberia who must reconsider the idea of living communally after plague and war have radically reduced the population. While she fails to enact a social contract she thinks through life in nature vs. life in community recognizing the moral value of legitimate community. (2)

In the novel, the writer stresses the importance of the coexistence of human beings and nature. Climate change, in the novel, is the result of failing to live in with nature, suggesting that the misuse of technological advancement against nature leads to its destruction. Therefore, Theroux portrays a world destroyed by such incomprehensibly sophisticated forms of technology. At the same time as he depicts Makepeace's struggles with hope and technological transformations on society and values, the writer values her attempts to overcome disastrous events through her continuous search for a place where people endorse law and order and behave in

civility. In “Cli-Fi: Birth of a Genre," Rebecca Tuhus-Dubrow, writes that “As in *Far North,* the characters have reverted to a primitive way of life; they hunt with bows and arrows and weave their own clothes” (Tuhus-Dubrow 59).

Accordingly, Theroux travels with his readers from the origins of humanity on the arctic land and the use of primitive ways of life to its potential end. He warns his readers about the dangers of climate change, but at the same time gives hope that there is still time for human beings to redeem and correct the effects of their anthropogenic activities.

The narrative starts with Makepeace, the sheriff, narrating the story to her unborn child, talking about her daily routine in her road journey to tour across the city and look for any remaining from the previous civilization that were destroyed by climate change and environmental degradation. She starts her narration with a negative description of the city she lives in in order to attract the readers’ attention to the degradation that surrounds her. “EVERY DAY I BUCKLE on my gungs and go out to patrol this dingy city” (*Far North*). From the beginning, Makepeace seems to be preoccupied with a vision that human civilization is fragile and can collapse as illustrated in the following extract:

> All those hours and days of human struggle, thousands, millions of them, spent building up this place, only to have it kicked down like an anthill by a spoilt child. There wasn’t a soul left in the whole

> place save us, I grew surer of it by the day. Imagine: a city of thirty thousand reduced to two women and a bump. And yet, the odd thing was, I liked it a lot better. I started going round it by foot. Something I hadn't done for years. It made me feel closer to the place somehow, crunching the broken glass and paper underfoot, spying the discarded things - a filthy doll, some spectacles, broken shoes - that told the story of my city. (*Far North*)

Through this passage, Theroux claims that human civilization is fragile and cannot resist climate change and environmental degradation. Liz Else in "Smart Companions" explains again this vision stating that "As climate change had made the summers longer and the winters milder, it seemed a smart alternative to the old, crowded, decaying cities. Yet this new dawn is more like a throwback sunset: in the face of disaster, civilization's fragile attempts to build cities collapse into slave camps, frontier-style lawlessness and brutality (48).

Such an explanation has been consolidated by the statements of many climate change critics who consider that climate change and the degradation of both human and other living beings are the result of humans' lack of awareness about the dangers of climate change. This idea is portrayed in the novel as stated by Tuhus-Dubrow:

> in Makepeace's time, wilderness is reclaiming cities; it's the accumulated knowledge of millennia that verges on extinction. Aviation, for instance: "[T]o turn words and numbers into metal and make them fly—what bigger miracle can there be?" Makepeace marvels. "It's a kind of heresy to say so, but I think our race has made forms more beautiful than what was here before us." (58)

The place Makepeace refers to is dirty, and to give a brief but clear description of it, she uses personification to express its feelings and summarize its sufferings from the

changed weather that becomes like a monster with teeth. She says, “The place feels almost drunk on the endless light, and time skids by for a week or two. We don’t get much spring or fall to speak of. Up here, for ten months a year, the weather has teeth in it” (*Far North*). Through this passage, the writer portrays the effects of climate change and environmental degradation on a small scale, on this given land to represent the sufferings of the whole Earth; it is Siberia, which people believed to be “the place as a land of ice, a desert of rocks and snow, with the wind blasting it ten months a year from the Urals to the Pacific Ocean” (*Far North*). For the writer, this degraded weather has led to the absence of seasons and the whole town becomes a kind of ghost town with no living body there. “This place had promised the first settlers everything. Now what was it? A ghost town, decaying back into wilderness” (*Far North*).

Theroux describes this place thoroughly in order to show the severe impact of climate change, which has led to the collapse of society presented in a chain of losses, the loss of nature, the loss of humans, the loss of civilization, and finally the loss of language. He calls this era, ‘a broken age’ as asserted by the narrator in the story. “That’s why I say we live in a broken age” (*Far North*). For her, this age seems very different from the previous ones, and it is easily distinguished to be the worst. “It went very hard with me after that, and the purpose vanished out of my life. My bad thing and every other bad thing that had happened in the years before

seemed like nothing compared to that" (*Far North*).

Throughout this context, the writer hints at the urgent need to talk about such dangerous effects of climate change hoping to solve them. Therefore, he presents climate change and environmental degradation in terms of effects not causes and gives his readers full descriptions of what might be defined as climate change. To do so, he relies on his character, Shamsudin, to give accounts about this broken age. Makepeace explains Shamsudin's interpretation of such environmental destruction as caused by the heating of the planet, she seems, however to see things from a different perspective:

> Shamsudin said the planet had heated up. They turned off smokestacks and stopped flying. Some, like my parents, altered the way they lived. Factories were shut down. 'You asked me about the Koran,' he said. 'But I understand it as a doctor. For all our knowledge, things happen that we do not understand. Sometimes, the patient dies not from her illness, but from the medicine.' (*Far North*)

Shamsudin states that the most important impact of climate change is the heating of the planet. He indirectly blames men to be the cause of this degradation. This is illustrated by the example he uses about the patient who dies not because of the disease but because of the medicine .i.e. science. He develops this idea of the material world that led to this heating when he says, "As it turned out, the smoke from all the furnaces had been working like a sunshade, keeping the world a few degrees cooler than it would have been otherwise" (*Far North*).

The writer starts his novel describing the dirty place where Makepeace is touring, but he later moves further to describe the whole planet that is under the threat of climate change and environmental degradation. Using some statistics, he insists on the fact that "around four and half milliard years after it began, the Earth started to alter" (*Far North*). In this quote, the writer mentions the age of the Earth to clarify how it has changed during the last decades because of climate change. This is well illustrated when he mentions a contemporary image of the Earth in an attempt to describe its sufferings; he writes:

> Looking at it from space, you'd have seen rocket ships and satellites burst out of it like corn from a popper. The Earth was in one of its warm times, had been since before we mastered farming - we'd grown accustomed to predictable seasons and good growing weather. But now there were so many of us, all wanting so much, and all armed with the inventions of previous centuries. Once, we'd been so many naked apes, scratching for life on the foreshore of an African ocean. Now we were a vast army, a termite mound of giants, who could shake the planet if we stamped together, who could warm the air just by breathing. (*Far North*)

In this passage, Theroux indicates that the effects of climate change are observable; just seeing the Earth from the space, the observer can notice such alterations. Contrasting it with its early ages, or as the writer argues, even before humans started the safe farming system where they used to do predictions for the coming seasons, it became warmer during the industrial age when humans started to depend on machines. For the writer, such changes are also proved by science; he states:

> Surrounded by a blur of clouds, turning from blue to white and back

> again as the centuries pass. They were long summers in which the oceans teemed and winters when even sea water froze hard. He said five times in that span of years all life had been wiped from the planet when it grew too dark or too hot. It was one of those times - a big moon that whacked into Mexico from space - that did for the dinosaurs.
> It sounded like fairy tales to me, and I asked him if it was written in his Holy Book - he said, and that it was science that said so. (*Far North*)

Theroux considers that human beings' anthropogenic activities are the cause of this environmental crisis, illustrating that they consider the planet they live in just as a continuous exploitable resource, "After the fifth time, it was our turn. We crept out of the mud. We peopled the planet, living in every corner, never mind wet or ice or desert, steadily growing wiser and more resourceful" (*Far North*).

In "Climate Fiction and Cultural Analysis: A New Perspective on Life in the Anthropocene," Gregers Andersen asserts that while humanity tries to agree on communal actions to stop the spread of global warming, they are themselves the cause that has led to such dangerous climatic changes and social collapse (31). In the novel, this vision is clarified by Shamsudin:

> As it turned out, the smoke from all the furnaces had been working like a sunshade, keeping the world a few degrees cooler than it would have been otherwise. He said that in trying to do the right thing, we had sawed off the branch we were sitting on. The droughts and storms that came in the years after put in motion all the things that followed. Life in the cities had ended. [...] 'The whole world is a barer and less interesting place,' he said. 'Human misery has few varieties: tent camps, forced labour, hunger, violence, men taking food and sex by force. *(Far North)*

In this passage, Shamsudin describes to Makepeace what might be a post-apocalyptic world, aiming to depict the effects of climate change. He explains that such effects have led to the collapse of the civilized world, where human life has become a misery characterized by homeless people, slave labour, food shortage, and violence, or as stated by Anderson, "a lack of inter-human communication is once again deployed here as a mirror of the shattered social contract" (33), defining a world where food and are taken by force.

To clarify more, Andersen makes a comparison between McEwan's *Solar* and Theroux's *Far North.* He declares:

> In other words, we are here introduced to a slightly different socio-anthropology than the one we were introduced to in, for example, *Solar*. Human self-interest is in *Far North* not imagined to be an insurmountable obstacle for radically reducing the global emission of greenhouse gases. Rather, humanity simply faces a phenomenon (i.e. anthropogenic global warming) which exposes its inability to see beyond the causality of its immediate actions (i.e. its short-sightedness). (*Far North, Pdf)*

Through this passage, Anderson explains the socio-anthropology presented in *Far North* which is different from the one presented in *Solar.* He adds that in this novel Theroux relates the behaviour of humans during the post-collapse period with the pre-collapse one, stating that the second is the consequence of the first:

> People had all those possibilities in them, devil and angel, depending on how the times moved them. Like the seed that splits concrete, it was the appetite for life in them that made them so destructive. It was just everyone's misfortune to be born in times when the wherewithal for living had got so scarce. *(Far North)*

In fact, the writer refers in an indirect way to the real cause behind climate change, which is the alterations human beings made in their living conditions that have led to the destruction of the natural world. Once again human beings' activities towards nature have been very harmful; they have caused the acceleration of climate change and environmental degradation; therefore, the place Makepeace searches for does not exist. Instead, she discovers a place where people try to build again their civilization upon forced labor. When Makepeace recognizes this, she herself feels the need to be independent and have her own peaceful territory. She realizes this through coexisting with a numbers of people who talk different languages on this territory.

Hope is the ultimate aim behind the writing of the novel. Theroux seems to be optimistic about finding solutions and solving the climate change issue. By describing Makepeace's change of behaviour and view of life, he refers to a new start. Human beings can correct their anthropogenic activities and befriend nature because they are responsible for such alterations. "They gave me a great feeling of hope for the future, those little brown packets: beans and corn, spinach, squash, and rutabaga, radish, melons, peas, tomatoes, zucchini, cabbage and chard" (*Far North*).

Moreover, Theroux considers that climate change and environmental degradation lead not only to the loss of the land but to the loss of civilization as well. He maintains that "Civilization and cities are the same thing," (*Far North*) referring to the destruction of the city or the end of the secured civil society that reveals

dangerous anthropogenic changed weather. According to him, the loss of the outer peace will ultimately cause the loss of the inner peace, and the loss of the land means the loss of freedom. This is well clarified through saying that, "The city expanded in front of us: the streets multiplied, the houses fanned out like trees in a forest, enfolding, embracing, hiding us - this dirty, dead, poisoned old city. And for the first time in so many years, I knew what it was to be free" (*Far North*)

Through this presentation of climate change and environmental degradation, Marcel Theroux is enabled to raise the readers' awareness and responsibility about the loss of nature, the cost human beings will pay if they do not stop experiments that cause climate change. The protagonist of *Far North* claims:

> He liked to say that ever since we slid out of the primeval mud on our bellies, we had been shaped by scarcity. Whatever you took: cheese, churches, good manners, thrift, beer, soap, patience, families, murder, fences - it had all come about because there was never enough, sometimes not quite enough, and sometimes not nearly enough, to go round. The story of the mass of humanity was the story of people struggling and failing to get the wherewithal for life. (*Far North*)

Through this extract, Theroux summarizes the aim of his novel that while human beings struggle to create a prosperous better life through realizing material success and development, they fail to preserve the environment they live in. He uses the past tense, "The story of the mass of humanity was the story..." as if the calamity has occurred and human beings are experiencing the environmental degradation and the

loss of civilization. The purpose, here, is to emphasize that if humans continue realizing material success at the expense of nature, this is the price to be paid. *Far North* offers consolation by stating that there is still hope to solve this worldwide problem. Marcel Theroux believes that there is still time and hope to avoid the destruction of human life. In the novel, this idea is highlighted by the birth of Makepeace's daughter. With her birth, the future holds hope for a fresh start.

To conclude, it is clear that climate change has not only exposed natural degradation but it has also revealed facts about human nature, proving in both novels the complexity of human identity and the different socio-political factors that influence and shape it. In *Solar*, sustainability and climate science are central to the narrative. McEwan's main idea is well illustrated through the portrayal of environmental degradation caused by climate change, believing greatly that human beings are the cause of climate change and environmental loss. McEwan also shows in his book that there cannot be a separation between humans' life and climate change. The bad exploitation of the natural world would lead to human beings' and other species' loss. In *Solar*, Michael Beard is given the chance to solve the problem of climate change but he fails to develop a new energy source from sunlight because of his greed. His work in the field of artificial photosynthesis as a way of harnessing the sun's power has made him rich and famous while it has failed to save nature. *Solar*, therefore, is considered as a speculative ironic account of this fictional

contemporary scientist who represents reality about the present environmental crisis and the way people react instead of focusing on science. Ian McEwan has chosen to grapple climate change, thinking that civilization needs another energy source that should be built far away from nuclear energy to save humanity and the whole planet.

However, in Marcel Theroux's *Far North*, the world has collapsed and led to a post-apocalyptic way of life because human beings could not coexist peacefully. The third novel to be analyzed in this research is Margaret Atwood's *Oryx and Crake* where the author shares with Theroux his post-apocalyptic vision that humans' anthropogenic activities will lead to their collapse.

Chapter Two: Ecocriticism as Ecofeminism in Margaret Atwood's *Oryx and Crake* and Sarah Hall's *The Carhullan Army*

This chapter aims at analyzing both of Margaret Atwood's and Sara Hall's imaginative responses to the current contemporary situation of climate change and environmental degradation in their two dystopian novels. According to the two writers, this phenomenon is the result of a cultural crisis. Therefore, the first section of this chapter tackles Margaret Eleanor Atwood's capitalist *Oryx and Crake,* (2003) which is considered as the first novel in her environmental science fiction *MaddAddam* Trilogy while the second section deals with Sarah Hall's *The Carhullan Army* (2007). The latter will be discussed from an ecofeminist perspective.

I. Forecasting the Novel Coronavirus and Human Extinction in Margaret Atwood's *Oryx and Crake*

The first novel in Margaret Atwood's trilogy, *Oryx and Crake*, investigates the relationship between human beings and nature. In this work, the writer deals with the topic of climate change and environmental degradation in an implicit way; she gives an interpretation of how to deal with climate change in the twenty first century by addressing issues like the extent of techno-scientific progress's damage of both nature and human nature. Therefore, her tendency has been directed towards representing the effects of this phenomenon on a global scale, where the whole world is under the threat of destruction. Like many writers who have been able to foretell

pandemic crises in their fictional worlds, Atwood has forecasted the Novel Coronavirus in this novel, where she gives her readers an account of the world before and after the apocalyptic plague that causes the extinction of humans and their civilization.

As demonstrated in the first part of this research, capitalist industrial regimes have been the ultimate cause of environmental degradation and climate change. In Atwood 's novel, the writer does not question environmental degradation the change of weather in a specific region and. Rather, her focus is put on the whole planet, Earth, and its inhabitants have become the center of twenty first century environmental literature in general and climate change fiction in particular. Atwood contends that Earth can survive without human beings, but human beings cannot survive without Earth. Thus, she has portrayed her concerns in a dystopian universe that warns and criticizes the current scientific, political, economic, and societal trends, looking for the causes that have led to such an environmental crisis, and questions its future aftermaths on both the planet and the human beings.

Setting the story in the future and in a bio-engineering and socially collapsed landscape, Atwood presents climate change and environmental degradation through the depiction of the end of the Anthropocene, the age of climate change. She forecasts the advent of a virus that would lead to the extinction of the human race

except for Snowman because he has been vaccinated. All people are replaced by another species generated by the scientist Crake. To depict life after Anthropocene, she uses elements of speculative fiction where she combines environmental themes with apocalyptic narratives (Bracke 2-3), depending on portraying this disaster and its aftermath. As a result, she arranges a narrative of a futuristic climate-changed world into two different periods, a world before and a world after the occurrence of the pandemic, imagining two different settings, pre-apocalyptic or dystopian and post-apocalyptic. Therefore, while she tells the story of Snowman‘s post-apocalyptic world, she offers her readers flashbacks about Snowman‘s memories, observations and conversations purposely to create an image of the pre-apocalyptic world in the minds of the readers; a world ruled by multinational corporations, whose employees lived with their families in compounds and detached from the rest of the population. Atwood, in fact, narrates what had happened before the global catastrophic pandemic took place, making her readers understand that the post-apocalyptic world is the outcome of the pre-apocalyptic world.

Oryx and Crake is a last-man narrative told by the protagonist Snowman, the only survivor of the human race, who in pre-apocalypse has been known as Jimmy, a son of two genetic scientists. The novel narrates his story simultaneously before and after the occurrence of a calamity, caused by a human-made virus that would destroy society and the whole world in general. The virus is a worldwide epidemic purposefully created and spread by the fictional idealistic scientist, Crake, who aims

to put an end to the Anthropocene, or in other words, to anthropogenic climate change and environmental degradation through the elimination of the existing earthly humans and their civilization and replacing them by the Crakers, a new scientifically generated human species. Crake selects Snowman to take care of them after the end of the world. Therefore, the narrative traces Snowman's past through flashbacks while he is making a journey to the RejoovenEsence compound where he used to live, in order to look for food.

Atwood starts her narrative with a post-apocalyptic setting that represents the end of the Anthropocene, giving a detailed description of the environment or nature in a near-future. Snowman, the only human survivor, is sitting on a tree and looking at the Crakers, who are playing in a world after this pandemic calamity had destroyed all humans and their civilization. She writes: "Snowman wakes before dawn. He lies unmoving, listening to the tide coming in, wave after wave sloshing over the various barricades, wish-wash, wish-wash, the rhythm of heartbeat. He would so like to believe he is still asleep" (*Oryx and Crake* 3).

In this new world, Jimmy suffers from starvation, so he decides to go and look for food and equipment in his previous compound, the RejoovenEsence. However, the voyage to this compound is dangerous because the road is full of threatening hybrid animals designed in the pre- apocalyptic era.

All along his trip to RejoovenEsence compound, Snowman turns back through flashbacks to his pre-apocalyptic world memorizing five specific periods in his past life. He starts narrating his childhood in the OrganInc compound living together with his parents; he remembers well how they moved to HelthWyzer Company. The other significant stage in his life he recalls is his teens; where his parents divorced, and he befriended an intelligent science student, Glenn, whom he calls Crake. Together the two friends spent their time smoking drugs and watching underground videos from subject areas, such as, live executions and child pornography. In addition, at that time, and during one of their pornography watching sessions, Jimmy was charmed by an Asian girl he saw. Jimmy remembers also his academic life after graduating from high school, where the two friends separated to study in different colleges. Jimmy studied humanities in Martha Graham, the not-so-highly-respected Academy whereas Crake studied advanced bioengineering in Watson-Crick, the highly respected Institute. Thus, he was able to create his peaceful engineered human-like creatures, the Crakers.

Flashbacks also take him to both his working time as librarian and his working in the RejoovenEsence compound with Crake. In that compound, he began his affair with Oryx, the Asian girl he once saw in the pornography videos. This period lasted up to the pandemic calamity and the death of both Oryx and Crake. During the same period, Crake realized his two projects; the first project was the

creation of the Crakers, and the second was the Paradise project or the BlyssPluss Pill project. Crake informed Jimmy about this second project telling him that it was just a kind of sexual stimulant and hiding completely the reality of the pill that would cause a worldwide pandemic. Therefore, he rented him to market it publicly. Temporarily, he saw the Asian girl, Oryx, in the Crakers' habitat. He hired her to be a prostitute for himself and a teacher for the Crakers, but Jimmy and Oryx formed a relationship and hid it from Crake, who sensed it progressively.

On the other hand, , Crake wanted Jimmy to take care of the Crakers if anything happened to them so Jimmy promised to protect them. After distributing the BlyssPluss Pill publically, it caused a global pandemic that ended the human race except for Jimmy and the Crakers, who were in the enclosed RejoovenEsence compound. Outside the compound, chaos was everywhere. At that time, Jimmy understood what happened realizing that Crake caused the pandemic. After returning from outside the RejoovenEsence compound with Oryx, who was injured, Crake told Jimmy that they were immune to the virus, then, he killed Oryx, and Jimmy killed him as a consequence.

Jimmy's exodus from Paradise into the wildlife refuge with the Crakers is the last period he recalls, the period, where Snowman's begins to narrate his story, and the reader finds him alone with the Crakers at the beginning of the novel. Therefore, Snowman / Jimmy is the only person who is able to recount how life was in the pre-

apocalyptic world and what really happened. The novel ends with his returning from this journey, yet Snowman suddenly comes across three humans who do not notice him. The narrative ends with a big question inside Snowman about what to do with the human beings he met; his wonder is whether to kill them or to befriend them. Finally, he takes a decision that is not shown to the readers: "Zero hour, Snowman thinks. Time to go" (*Oryx and Crake* 192).

Contrarily to Ian McEwan's use of the present anthropocentric world, a scenario of a commonplace, where he applies an alarmist tone about the dangers that human beings may face in case they do not take workable decisions to stop climate change, Margaret Atwood uses a confronting tone, where human beings are living the disaster that the Anthropocene may lead to. In analyzing Atwood's novel in their article, "Writing the Anthropocene," Tobias Boes and Kate Marshall consider that "her genetically engineered Crakers instead inhabit a post-apocalyptic world already done in by environmental degradation. Her novels thus challenge us to again think across discrepant scales: to imagine what our species-being might look like *after* the end of the Anthropocene" (70).

This ecocritical analysis of the novel will show the anthropocentric vision of Margaret Atwood. The writer imagines that human anthropogenic activities will lead to the end of the Anthropocene; she reveals that there is a connection between the appearance of viruses and human misuse of environment as proved by John Charles

Ryan in his article, "Ecocriticism." Basing his research on scientific studies, Ryan links the appearance of viruses, such as, Coronavirus, to climate change and environmental degradation. He indicates that climate change is considered to be "a factor in increased human mortality from extreme heat stress, air pollution, and viral outbreaks (3). By this, he refers to the outbreak of viruses as an effect of climate change. This claim is supported by the World Health Organization in, "Climate Change and Human Health," where it is stated that, "Climate change, one of the global environmental changes now under way, is anticipated to have a wide range of impacts upon the occurrence of infectious disease in human populations" (104).

Ryan considers that, the World Health Organization links climate change to the global diffusion of infectious diseases, such as, COVID-19, which reached pandemic proportions in 2020 and impacted the whole world for at least two ears and caused hundreds of thousands of deaths. Ryan suggests,

> Despite its all-consuming implications for human and more-than-human communities the world over, the coronavirus pandemic nonetheless reaffirms the interdependencies between the health of people, animals, plants, ecosystems, and the biosphere as a whole.
> In 2020, the Black Summer catastrophe in Australia—followed by the COVID-19 pandemic, itself compounded by other upheavals of health, economy, and ecology—overshadowed a pointedly symbolic event for environmental humanists. (3)

In this passage, Ryan insists on the connection between both the human world and the nonhuman world, claiming that the Covid-19 crisis is an opportunity for human

beings to reconsider their anthropogenic relationship with the whole planet, insisting on the fact that their health and wellbeing are related to the health of the planet. For him, such a call can be strengthened as he writes with "the arrival of the emergency humanities (ASLE, Humanities on the Brink) or what might be termed the 'pandemic humanities' (4), referring to the role of humanities to share discussions about global scientific issues. Margaret Atwood's *Oryx and Crake* is an example of how human art can foresee the appearance of viruses as an effect to the twenty first century environmental concerns.

Interpretations of *Oryx and Crake* reveal that Atwood has imagined the end of the Anthropocene as result of the anthropocentric relationship between human beings and nature. She depicts a fictional virus akin to the Novel Corona virus so that her readers become aware about the consequences of climate change and environmental degradation, the potential results of their anthropogenic activities towards the planet. Atwood predicted the pandemic many years ago, before the appearance and spread of Covid-19 all around the world in 2020. In her novel, she offers her readers a prophetic narrative full of details and facts about how to encounter a deadly virus like Covid-19.

In the world of the novel, Atwood does not alter any evidence that climate change and environmental degradation are the real causes of the appearance of the fictional deadly virus. She depicts a world similar to the current world human beings

are living in, and this is the strategy used in most of climate change fiction to tackle this environmental issue. She also portrays characters as living a similar situation to the situation human beings experience in reality with Covid-19. Therefore, the analysis, here, is based on raising points of comparison between both viruses. Social enrollment, strengthening case isolation and close contacts, blocking pandemic areas, reducing personnel movements, increasing social distancing, environmental measures, personal protection, and forcing to shutdown millions of businesses are the adopted control strategy and the basic procedures that have been a necessity for all countries all over the world to fight and stop the spread of Covid-19 during its early stages.

The main character, Jimmy, is also called Snowman; he is given this name to refer to the age of climate change and environmental degradation. Jimmy is guided by his mother, who is a microbiologist, of how to protect himself from viruses. She gives him instructions that are regarded in the era of Covid-19 to be of primary importance of how to defeat the virus. First, she gives him a definition of what is meant by the disease and how it is caused. She says it is, "invisible, because it was so small. It could fly through the air or hide in the water, or on little boys' dirty fingers, which was why you shouldn't stick your fingers up your nose and then put them into your mouth, and why you should always wash your hands...." (*Oryx and Crake* 11) The instructions the mother gives, here, to her child, such as, not touching the nose

and the mouth with unclean hands and the continuously washing of hands are the basic measurements to be protected from viruses, a type of culture that even non-scientific people know, but the question remains on whether people are strict in applying them or not. However, with Covid-19's outbreak, these instructions have become the main defense against the virus to help people protect themselves.

Jimmy's mother, in the novel, describes how the virus functions in the human body:

> A disease got into you and changed things inside you. It rearranged you, cell by cell, and that made cells sick. And since you were all made up of tiny cells, working together to make sure you stayed alive, and if enough of the cells got sick, then you . . ."I could get a cough," said Jimmy. "I could get a cough, right now!" He made a coughing sound. (*Oryx and Crake* 11-2)

As quoted above, the role of the mother is to simplify the scientific discourse to her son. She is aware of its importance to be clarified and communicated so that she raises his knowledge about the danger of viruses that can cause the spread of various diseases. Thus, she explains to him how to avoid them through applying personal hygienic protection like washing hands and not touching the nose and the mouth with dirty hands. Related to Covid-19 era, scientific authorities have applied the same strategy to raise awareness among people of how to protect themselves to avoid being infected by the virus and get ill. This hints at Atwood's point of view of how the solution to fight diseases can be cultural. Such pieces of information stick in Jimmy's head, the protector of the Crakers, and help him at the beginning of the pandemic crisis to take decisions to stop the spread of the virus, and protect both

himself and the Crakers.

The fictional virus in *Oryx and Crake* outbreaks suddenly and spreads very fast; it conquers the whole world in a very short time. In the world of the novel, the news report of the appearance of a worldwide virus called JUVE. JUVE is the abbreviation of the Jetspeed Ultra Virus Extraordinary, denoting a virus that causes the death of thousands of people in a very fast way. When Snowman hears the news at the beginning, he thinks that it was just routine, and that it was "another minor epidemic or splotch of bioterrorism, just another news item" (*Oryx and Crake* 167). Moreover, he does not care about it; he merely thinks that it is far away from him because it is just in another country which is Brazil:

> The boys and girls with the HotBiosuits and the flame-throwers and the isolation tents and the crates of bleach and the lime pits would take care of it as usual. Anyway, it was in Brazil. Far enough away. But Crake's standing order was to report any outbreaks, of anything, anywhere, so Jimmy went to look. (*Oryx and Crake* 167)

Not being aware of the dangers that a virus can cause in an age of a worldly pandemic is the first remark Atwood attracts her readers to. Snowman shows this feeling of carelessness at the beginning when the virus emerged first; it was very far away, and no one thought that it would reach his own country and home. This is in fact similar to what happened to people when Covid-19 started spreading all over the world. According to given strategies, there was an outbreak of the virus in one

country, then in another, spreading then from country to country and affecting thousands of people at the same time, to reach in less than a year the whole planet.

In the novel, Jimmy finally understands that what is going on is something that humanity has never lived before; it is an alarming and ongoing pandemic that hits one place after the other as if it is a 'rapid fire. ' He says, "Then the next one hit, and the next, the next, the next, rapid-fire. Taiwan, Bangkok, Saudi Arabia, Bombay, Paris, Berlin. The plebe lands west of Chicago" (*Oryx and Crake* 167). Jimmy also realizes that the virus's attacks have become simultaneous to include the whole world, "By midnight the hits were coming almost simultaneously. Dallas. Seattle. New New York. The thing didn't appear to be spreading from city to city: it was breaking out in a number of them simultaneously" (*Oryx and Crake* 168). Spreading globally is a shared characteristic with Covid-19 virus that has stuck the world. The screen maps in both the fictional world and reality show how the pandemic has reached every part of the world at an unbelievable speed: "The maps on the monitor screens lit up, spackled with red as if someone had flicked a loaded paintbrush at them. This was more than a few isolated plague spots. This was major" (*Oryx and Crake* 167).

Jimmy, in the novel, thinks that it is a global emergency, and this is highlighted through the panic situation of the three men who come to see Crake and

blame him for the BlyssPluss Pills; they begin asking what to do in this difficult and strange situation, what measurements they should take. “There were three staff in the room now: Rhino, Beluga, White Sedge. One was humming, one whistling; the third - White Sedge - was crying. *This is the biggie.* Two of them had already said that. “What’s our fallback?” “What should we do?” (*Oryx and Crake* 168) Jimmy’s advice in this situation is not to panic. He refers to the importance of being psychologically balanced. According to him, people should not panic; or otherwise, they will be contaminated:

> “Nothing,” said Jimmy, trying not to panic. “We’re safe enough here. We can wait it out. There’s enough supplies in the storeroom.” He looked around at the three nervous faces. “We have to protect the Paradice models. We don’t know the incubation period, we don’t know who could be a carrier. We can’t let anybody in.” (*Oryx and Crake* 168)

As illustrated in the previous quote, the narrator gives the key of how the virus spreads; it is carried or transmitted from person to person, a factor that has distinguished Coronavirus from the beginning of its outbreak. Therefore, the first measurement for Jimmy since “here was a lot of dismay out there” (*Oryx and Crake* 169) is the lockdown, where he and the Crakers are not allowed to leave the area or let any other body enter. In addition, in this passage, he refers to safety through social distance, and this is what has happened in reality with Covid-19; people have been lockdown, prevented from visiting one another or even meet one another. JUVE, Covid-19 in reality, has been demonstrated to be human to human transmitted, “In the event of a bio attack, don’t let anybody in” (*Oryx and Crake*

169). In the novel, the lockdown seems to be effective in blocking the spread of JUVE inside RejoovenEsence compound where Jimmy and the Crakers live, proving the crucial role of the lockdown to stopping the spread of the virus.

In fact, the reader learns in the novel that the virus was spread through Crake‘s BlyssPluss Pills, the drug that was sold all over the whole world by Oryx, “What fucking *everything*? It’s a worldwide plague! It’s the Red Death! What’s this about it being in the BlyssPluss Pills?” (*Oryx and Crake* 168). Likewise in reality, a lot of questions have been put to investigate the origins of Covid-19 virus; one of them is whether it is a human-made virus or not. Like what has happened with Covid-19 in reality, in the depicted world, there are “not nearly enough ambulances” (*Oryx and Crake* 169). Healthcare workers are tirelessly working to keep the communities safe; they are working on the front line, sacrificing their own health for others, denoting another type of war with new types of strategies and another type of army against an unseen enemy. And, here, starts the role of political and security language to raise awareness about the danger of breaking the lockdown and the spread of the virus: “The keep-calm politico speeches were already underway, the stay-in-your-house megaphone vehicles were prowling the streets” (*Oryx and Crake* 169). Even the religious rituals are not allowed to be practiced outside houses; Jimmy says, “Prayer had broken out” (*Oryx and Crake* 169). This passage draws a vivid image of what has happened in reality with Covid-19, where political and

security authorities have taken the responsibility for raising awareness in their speeches through a well selected language.

The symptoms of JUVE are numerous and very serious: high fever, bleeding from the eyes and skin, convulsions, then breakdown of the inner organs, followed by death,

> Jimmy tried phoning Crake on his cell, but he got no reply. He told the monitor crew to go to the news channels. It was a rogue hemorrhagic, said the commentators. The symptoms were high fever, bleeding from the eyes and skin, convulsions, then breakdown of the inner organs, followed by death. The time from visible onset to final moment was amazingly short. The bug appeared to be airborne, but there might be a water factor as well. (*Oryx and Crake* 167)

The writer proposes also another safety measurement through clothing. The way of dressing, a model that has become very common with the appearance of Covid-19. Atwood describes the clothes they wear to protect themselves. She writes,

> Daylight filters through the insulating glass bricks facing the skylight window well. He roams around the space he once inhabited, feeling like a disembodied sensor. Here is his closet, here are the clothes once his, tropical-weight shirts and shorts, ranged neatly on hangers and beginning to moulder. Footwear too, but he can no longer stand the thought of footwear. It would be like adding hooves, plus his infected foot might not fit. Underpants in stacks on the shelves. Why did he used to wear such garments? They appear to him now as some sort of weird bondage gear. (Atwood 173)

Jimmy thinks that despite taking all such measurements and wearing all these clothes, there is still a risk to be contaminated. He says: “I’m toughing it out in a

biosuit, but I don't really know whether I'm contaminated or not. Something's really gone off the rails" (*Oryx and Crake* 174). The home routine is another challenge Jimmy faces. Similar to the home routines of people during the Covid-19 quarantine, Jimmy in the fictional world stays long hours without doing any kind of physical activity, trying to do work from home. He takes care of the Crakers, sleeps and sits a lot doing nothing for long hours or watches events on TV or on the Net, such as the breaking of transportation, invasion of supermarkets, and leaving churches and mosques.

The narrator, here, provides readers with images of life during lockdown. He shows how life routine has changed since the outbreak of the virus, JUVE. This routine is similar to the one people have experienced with the outbreak of Covid-19, and their forced lockdown; people all over the world have been obliged to stay at home almost all the time, getting out only in cases of emergency or to go to the supermarket to buy their necessities, respecting social and physical distancing, staying two meters far from one other.

In *Oryx and Crake*, JUVE occupies all discussions, like Covid-19, it dominates most of the programs and talks on television,

> Pundits in suits appeared on the screen; medical experts, graphs showing infection rates, maps tracing the extent of the epidemic. They used dark pink for that, as for the British Empire once. Jimmy would have preferred some other colour. (*Oryx and Crake* 175)

In the world of the novel, doctors, researchers, experts, politicians, all have a say about what is happening. In television programs, the sanitary situation is described daily with statistics and graphs about dead and infected people. In the same way as the world we are living in, even the questions of using and taking a vaccine is raised:

> There was no disguising the fear of the commentators. *Who's next, Brad? When are they going to have a vaccine? Well, Simon, they 're working round the clock from what I hear, but nobody's claiming to have a handle on this thing yet. It's a biggie, Brad. Simon, you said a mouthful, but we've licked some biggies before.* Encouraging grin, thumbs-up sign, unfocused eyes, facial pallor. (Oryx and Crake 175)

In the same way as Covid-19, JUVE virus can change the human cells' system as well as the whole lifestyle system. Alter one week of the outbreak of the virus, people start to show signs of infection. Patients are hospitalized, the medical staff gets infected and starts, and a state of international emergency is raised.

The depiction of the global emergency in the novel's world during the second week is strengthened by other measurements to stop the spread of JUVE, notably, after the wide spread of the virus, and the unmanageable situation of hospitals. Thus, the decision is taken for the closing of ports and airports. The narrator describes the alarming situation in hospitals and elsewhere as follows:

> In the second week, there was full mobilization. The hastily assembled epidemic managers called the shots - field clinics, isolation tents; whole towns, then whole cities quarantined. But these efforts soon broke down as the doctors and nurses caught the thing themselves, or panicked and fled. *England closes ports and*

> *airports. All communication from India has ceased.* (*Oryx and Crake* 176)

Hospitals are unable to receive any more patients. The medical staff is unable to take any additional patients in charge. Infected people are advised to stay at home and drink a lot of hot water. “If you feel ill, drink plenty of water and call the following hotline number” (*Oryx and Crake* 176). These procedures, in fact have become familiar to most people with the outbreak of Covid-19, People have experienced most of the scenarios described in Atwood's fictional novel. Yet, in the world of the story all people die except for Jimmy and the Crakers,

> Meanwhile, the end of a species was taking place before his very eyes. Kingdom, Phylum, Class, Order, Family, Genus, Species.
> How many legs does it have? *Homo sapiens sapiens* , joining the polar bear, the beluga whale, the onager, the burrowing owl, the long, long list. *Oh, big points, Grandmaster.*
>
> Sometimes he’d turn off the sound, whisper words to himself.
> *Succulent. Morphology. Purblind. Quarto. Frass.* It had a calming effect. (Oryx and Crake 177)

Thus, Jimmy, in the novel, the only vaccinated person, starts a monologue wondering how he could be the only survivor, and how he can continue to live without other human beings,

> “I don’t believe it, I don’t believe it,” he’d say. He’d begun talking to himself out loud, a bad sign. “It isn’t happening.” How could he exist in this clean, dry, monotonous, ordinary room, gobbling caramel soycorn and zucchini cheese puffs and addling his brain on spirituous liquors and brooding on the total fiasco that was his personal life, while the entire human race was kakking out?
> (*Oryx and Crake* 177)

This passage shows that Jimmy’s consciousness has developed, acknowledging that

the occurrence of the catastrophe has just taken a short time to cause the end of the human race. At this stage, he becomes aware of what has happened. Though no one is going to be interested in his explanation-because he is the only survivor, he admits,

> I don't have much time, but I will try to set down what I believe to be the explanation for the recent extraordinary events catastrophe. I have gone through the computer of the man known here as Crake. He left it turned on - deliberately, I believe - and I am able to report that the JUVE virus was made here in the Paradice dome by splicers hand-selected by Crake and subsequently eliminated, and was then encysted in the BlyssPluss product. There was a time-lapse factor built in to allow for wide distribution: the first batch of virus did not become active until all selected territories had been seeded, and the outbreak thus took the form of a series of rapidly overlapping waves. For the success of the plan, time was of the essence. Social disruption was maximized, and development of a vaccine effectively prevented. Crake himself had developed a vaccine concurrently with the virus, but he had destroyed it prior to his assisted suicide death. (*Oryx and Crake* 179)

For Jimmy, though Crake represents science, he is the only person to blame for the pandemic catastrophe.

After the end of the pandemic, the protagonist, Jimmy, writes,

> Although various staff members of the BlyssPluss project contributed to JUVE on a piecework basis, it is my belief that none, with the exception of Crake, was cognizant of what that effect would be. As for Crake's motives, I can only speculate. Perhaps . . . (*Oryx and Crake* 179).

Jimmy's speculation in this passage is a hint at Atwood's own insights of how to solve the problem of climate change. The writer considers that the solution might not be scientific only; it can be cultural as well, referring to the role of literature to

increase people’s awareness to deal with climate issues. Thereby, she aims through her novel, not only to speculate on the drastic consequences of the eventual spread of a virus as a consequence of Human's abuse of nature, but she also targets all human beings, trying to make them aware of the consequences of their acts on the planet with all its ecosystems, causing the decay of all elements of the nonhuman world.

Through *Oryx and Crake,* Atwood depicts the way anthropocentric activities to realize material wealth have led the whole world to global ecological disasters, such as, climate change and the appearance of deadly viruses, causing not only the extinction of the nonhuman world but human beings as well. In the novel, she shows her tendency towards fighting climate change and environmental degradation. For her, each individual should be involved in solving this environmental problem; she calls for making a change in human behaviors regarding the common good of the planet, indicating that a healthy planet is the basis for human health, and that civilization should not be the cause of a degraded planet. The global emergency portrayed in the novel and the procedures followed to try and save humans in *Oryx and Crake* are the same procedures human beings have adopted in reality with Covid-19, such as, lockdown, social distance, airports and businesses’ closing, public and private meetings' prevention, and supermarkets’ scenes. The writer has shown that human civilization is fragile and can collapse in front of an unseen and unpredictable enemy like JUVE.

Il-Sarah Hall's *The Carhullan Army:* The Anthropocene as Flooding

After dealing with Atwood's significant presentation of the Anthropocene in her novel, *Oryx and Crake,* in the previous section, the focus of this section has been put on Sarah Hall's third novel *The Carhullan Army* (2007), a dystopian science fiction work which is also known as *Daughters of the North.* The aim behind this section is to investigate Hall's position towards this global issue and how she has presented it in her novel. Basing her work on ecofeminist interpretation of climate change, Hall insists on tackling the global environmental crisis caused by industrial and technological developments and saving the environment through the breaking traditional patriarchal structures (Alkhattabi 1). Basing her work on facts provided by scientists and climate change experts, the writer deals with the issues of severe climate changes and their aftermaths that have become observable and threatening to populations. In fact, the background of the novel is very important to explain the writer's choice of the theme and the writing of its narrative. In "Flooded Futures: The Representation of the Anthropocene in Twenty-First-Century British Flood Fictions," Astrid Bracke states that Britain has witnessed environmental and climatological changes that will certainly lead to floods. She considers that such changes "will make floods twenty times more likely by 2080, affecting at least twice as many people than are currently at risk from flooding" (2). Bracke adds that, "While it is notoriously difficult to relate individual events to climate change, attribution studies increasingly show direct links between anthropogenic climate change and extreme weather events

such as heat waves, hurricanes, and floods" (2). Through this, Bracke refers to the indirect causes that have led to climate changes which is the irresponsible human consumerism.

In the same article, Bracke defines flood fictions by referring to two major features. The first feature, according to her, is "the depiction of floods as an effect of and synecdoche for climate crisis, making use in particular of the historical and visual connotations of floods" (1); this first feature is the core of the analysis in this section. The second feature she mentions, which is a point of interest that will be discussed later, in the last chapter, is "the depiction of the literal submersion of the narratives themselves by means of language erosion and narrative fragmentation" (1). Therefore, Hall reinforces her novel as flood fiction which tackles "some of the imaginative and representative challenges posed by the Anthropocene" (Bracke 1). Accordingly, Hall's presentation of climate change has been inspired by such historical and social facts. She has presented this phenomenon in terms of floods that cause the suffering of both women and nature. Her presentation lies in the fact that climate change and environmental degradation are the result of a patriarchal society that has dominated both the land and women, and their liberation should be straightforward. Ng Soo Nee in his *(Re)Configurations of Power and Identities in Twenty-First Century Fiction,* considers that what preoccupies Hall in her novel reflects, to an extent,

> twenty-first century concerns with renewable resources, man's relationship with technology and nature, as well as gender relations that continue to confound western societies despite their more than a century-long experience with feminist struggles. (23)

Ng Soo Nee refers to the social, economic, political, gender, and environmental issues that have helped Sarah Hall discuss the issue of climate change and environmental degradation from an ecofeminist perspective. Hall who started her fiction writing with historical fiction, has moved to deal with exploring contemporary issues through the use of "future and alternative realities;" therefore, her novel, *The Carhullan Army* is inspired by the Iraq War, climate change and her growing fears of radicalisation. She has created a story in which a young woman, living in a flooded Britain under totalitarian control, is indoctrinated into a rebel uprising.

Setting *The Carhullan Army* in a near future, the author focuses entirely on portraying a large-scale eco-disaster caused by climate change; a flooding hits Britain and leads to severe outcomes, such as, economic, gender, racial and environmental disasters. In the same way as Ian McEwan, Marcel Theroux, and Margaret Atwood, Sarah Hall presents climate change and environmental degradation in terms of results, giving an account of what might happen if this environmental problem continues to occur. She portrays such results on a small scale, imagining that the Anthropocene will lead to flooding. The story takes place in her country of origin, Cumbria, portraying a futuristic society that suffers from climate change and environmental disasters and the thriving of women. Bracke

argues that Hall has been inspired by the floods that occurred in the twenty-first century to write her novel, *The Carhullan Army*, where she imagines that the river Eden will swell and flood after her realization that the effects of climate change "were no longer imagined, but visible" (quoted in Bracke 3-4). Hence, climate change stories are told as analyzed by Bracke "through the narrative perspective of characters who are survivors rather than victims of climate crisis" and "use the historical and visual connotations of floods to show catastrophic climate change"

Like the previously analyzed novels, *The Carhullan Army* is told by a survivor, the protagonist, Sister, who tells her story from a prison cell while she is under arrest. The novel is set in the Lake District, which is situated in the north of England while the country as a whole is under an environmental and economic crisis. The novel has two specific settings, and each symbolizes a different society. The first setting refers to the dystopian city of Rith, an industrial location plagued by sickness and fear, and the second setting is the Carhullan, a farming village led by women.

Rith is a city designed as an Orwellian dystopia, where an official group named the Authority controls everything. The readers are told of conflicts that occurred in its poor totalitarian society, and which later led to its destruction. In addition, natural resources and agricultural fields disappeared because of flooding caused by climate change and environmental degradation. The depicted society and its members, whose food is provided by the United States of America because of the

damage caused by floods on its agriculture, is controlled by power structures called the Authority who do not give voice to neither men nor women. In factories, workers are endangered with a severe control similar to slavery working conditions, with no labour rights; they work for long hours just to be paid back with scarce food.

The openning passages of the novel are very important in highlighting the ecofeminist perspective from which the work is built since the writer describes portrays patriarchy and the industrial regimes as the main exploiters of both women and nature, and are the cause of their suffering; she holds that these are the real causes behind climate change. She depicts the mistreatment of both women and nature as going hand in hand, emphasizing the fact that their cry has to be heard and their suffering has to have an end.

Written in 2007, *The Carhullan Army* hints at the different forms of oppression that still exist and that should be fought. Hall starts first by depicting the devaluation and abuse of the main character, Sister:

> My name is Sister.
> This is the name that was given to me three years ago. It is what the others called me. It is what I call myself. Before that, my name was unimportant. I can't remember it being used. I will not answer to it now, or hear myself say it out loud. I will not sign to acknowledge it. It is gone. You will call me Sister. (*The Carhullan Army* 8)

Sister is treated as a non-human; she is considered as an object whose name is not important. She has no the choice of her new name and is obliged to accept what they

dictate to her. However, she asks the readers to call her 'Sister. 'By doing so, Sister attracts the readers' attention, and lead them to follow her in her journey from the industrialized toxic Rith towards the farming Carhullan, leaving the dystopian society with its patriarchy towards a utopian community built up for women. She says, "I was the last woman to go looking for Carhullan" (*The Carhullan Army* 8).

The writer also provides readers with vivid images and detailed descriptions of Rith as an extremely toxic society, giving a full picture of the effects of human anthropogenic activities and the suffering of its people. Sister expresses:

> The bacterial smell of the refinery and fuel plants began to disperse at night when the clouds thinned and the heat lifted. Each year after the Civil Reorganisation summer's humidity had lasted longer, pushing the colder seasons into a smaller section of the calendar, surrounding us constantly with the smog of rape and tar-sand burning off, and all of us packed tightly together like fish in a smoking shed. (*The Carhullan Army* 5)

In this passage, Sister mentions the characteristics of her dystopian society and summarizing the suffering of the polluted land as the suffering of women in this collapsed society. The city is under total control of Authority. The latter has opened new fuel factories everywhere in the area, which has led to the degradation of environment, multiple changes in the climate, and reccurent floods in the town. Things have worsened especially, after the depicted eco-war between China and South America. The citizens do not have any kind of power. Because of this environmental calamity, the city has become devastated. Electricity is rationalized, and natural resources are depleted; as a result, oil is nearly finished. The recovering

plan for Rith costs people's lives. Authority has obliged people to live in small apartments, 'quarters,' and to work in factories without allowing them to leave the city. All these restrictions have a double effect on women. The latter suffer more in this reduced natural world. Even their motherhood rights have been subjugated to the control of the Authority under population control and environmental protection covers.

From an ecofeminist perspective, the Authority's strict control over society is considered as a patriarchal system that has negative effects on women. The portrayed society in the novel marginalizes and dehumanizes women sexually and maternally and gives them no civil rights. The Authority and men, in general, treat them as objects; Even the decision of motherhood is not theirs; they are controlled through strict governmental rules, especially, women in the age of child-bearing who are fitted with contraceptive devices. They regulate their productivity by forcing them to wear contraceptive devices; the only way they have to have children is through breeding lotteries. The Authority applies rules to control women's bodies, sex, and productivity through the use of vehicles or coils and to control them from time to time: "The authority was making random examinations; that women were sometimes asked to display themselves to the monitors in the backs of cruisers" (*The Carhullan Army* 21). In a number of passages, Hall depicts the suffering of the land as going hand in hand with women's suffering. Indeed, in a number of passages, women's suffering is associated with the land's exploitation. Through the use of connotations,

such as using a female pronoun to refer to a land, makes it easier to associate the suffering of the Rith landscape with the suffering of her women, and specifically to connect the suffering of the land with the suffering the protagonist Sister.

On the other hand, Sister, the protagonist of the story who represents the suppressed women, becomes aware of the position of women as subordinates to men and to the Authority. The experience she lives in a check routine is disgusting. She narrates how she comes across it, an experience she does not want to repeat, "I would not be taken into the back of a cruiser and humiliated again." She describes how the monitor acts with her as if she is not a human being; as if she is just an object without feelings, "had me lower my overalls in front of his colleague, who had come forward with a gloved hand, joking about dog leashes, and though the wire of my coil was easily seen, he had still examined it" *(The Carhullan Army* 14-15). In another context, she explains how she is against such mistreatment and cannot tolerate it anymore:

> Since the regulator had been fitted I'd felt a sense of minor but constant embarrassment about myself, debilitation almost, as if the thing were an ugly birthmark. I knew others around me were fitted too, and on the surface they seemed to accommodate the intrusion...the device felt exactly as it was: an alien implant...It was like a spelk under the skin; it had stopped pricking, but I hadn't for one day forgotten it. And I was not wrong to hate it. *(The Carhullan Army* 59)

Though using this population rhetoric is considered as a policy adopted by the Authority to protect the environment and organize people's lives in Rith, it has also been a device of exploitation of women's fertility. Sister recognizes that this rule

carries hypocritical attitude from the Authority. Therefore, she shouts at her husband, Andrew, saying that "She's a female," referring to Britain, "is she, this country that has been fucked over?" (*The Carhullan Army* 23).

For Sister, her husband, Andrew, is another type of the patriarchal oppression she suffers from in Rith. Therefore, she is against her society, her husband, Andrew, and the circumstances she lives in. She says, "The truth was that he had accepted the way of things, and I couldn't. I had despised the place I lived in, the work that brought no gain. And I had begun to despise Andrew" (Hall 19). Therefore, she decides to escape from her city, Rith, towards the Carhullan, a community consisting of women only and led by Jackie, hoping to live in a better farming place and gain her rights like women who are living there. Unfortunately, Sister is arrested and shocked by the ill-treatment she receives there. She stays in this situation until she overcomes all the stages and becomes one of them and lives in this matriarchal society, which does not give any rights or place to men.

Taking the power over everything in Britain for the purpose of recovering the country, the Authority aims to gain wealth through economic growth, and this has led to ecological crisis, making living conditions worse, especially, the human health. Hall depicts the lands in the novel as contaminated territories in the same way as the humans living on them. . In the following passage, a woman living in quarters tells Sister that her body has been contaminated and diagnosed with tuberculosis:

> The woman looked at me again with an annoyed expression. 'Oh, it's all right. I'm just in a bad mood,' she said. 'Turns out I've got TB. That new bloody strain. Aye, so. I'm away into quarantine probably and the kids will have to contend with their father. They say there are some drugs that will help. But I know it's not true. Besides, I've got no money. Who the hell has? Oh, but they've given me this - for all the good it'll do!' She reached into her coat pocket, took out a faith card, and tossed it to the ground. She rolled her eyes. 'These bloody Victorian houses. I might as well put on a corset, sleep in the coal shed, and have done with it, right?' (*The Carhullan Army* 28).

Here, the writer associates the suffering of the land with the suffering of females; both of them are contaminated because of the patriarchal Authority system over the land and over them. The causes of such illness, according to what Sister hints at in the novel, are the dangerous factory fumes and the poor state of the quarters. Thus, the writer in this scene portrays the female contaminated bodies as inseparable from the polluted land, meaning that both of them are suffering from the same abuser.

The exploitation of both women and lands in the novel reaches its climax in the novel when Sister no longer bears the exploitation she endures and decides to escape from Rith to a better place ruled by women in Carhullan. In fact, Carhullan stands for the ecocentric place that ecofeminists dream to create. This society excludes men and gives space only to women as Hall imagines, fulfilling the ecofeminist utopian vision that is women should win their identities and bodies and feel free without the domination of men over them. Adam Trexler affirms in his book *Anthropocene Fictions: The Novel in a Time of Climate Change* that "the narrator,

Sister, escapes in order to join a self-sustaining community of radical feminists who eventually become militarized and lead a revolutionary assault on the local town" (134). He acknowledges that *The Carhullan Army* like other climate change novels " take climate change as a starting point for a radical consolidation of hegemonic powers, either in the state or in corporations that have replaced the state... As a result, the antitotalitarian novel of the twentieth century proves to be deeply limited as a response to global warming" (134-5).

Before reaching the Carhullan, Sister's expectation has been to find a perfect place to live in. Though the Carhullan is an unofficial group, Sister seeks to join it to escape from the patriarchal control of both the Authority and her husband, Andrew. She believes that the Carhullan agrarian community will give her back her rights and freedom. In addition, Sister's new refuge allows lesbian sexism, and Sister is able to have a sexual relationship with Shruti without being persecuted. In fact, such a new community where lesbian relations are encouraged instead of heterosexual relationships meant to build a separatist lesbian feminist community to escape from male supremacy and patriarchal oppression. Sister quotes what Jackie once told her:

> It's still all about body and sexuality for us,' she was once quoted as saying. 'We are controlled through those things; psychologically, financially, eternally. We endorse the manmade competition between ourselves that disunites us, striping us of our true ability. We don't believe we can govern better, and until we believe this, we never will. It's time for a new society" *(The Carhullan Army* 35)

In “Landscape and Identity: Utopian/Dystopian Cumbria in Sarah Hall’s The Carhullan Army” Emilie Walezak considers that, “Hiding away in the Northern uplands, which recalls Piercy’s utopian Mattapoisett community” (1) was Sarah Hall’s aim in order to write her novel aiming to criticize her society because of the multiple degradations witnessed in her local environment, “Anticipating the 2008 global financial crisis, the novel originated in the shock Hall experienced in 2005 with the unprecedented floods that impacted her native region of Cumbria” (1). The climate crisis offered Hall the possibility or the chance to elaborate a post-apocalyptic world and use localism as Walezak states “to problematize contemporary spatial issues relating to the imaginary borders between countries, genders, classes, and cultures and to illustrate the very real ensuing struggles with discrimination, separatism, and fundamentalism” (5). Through the world of the novel, she visits the past with its agricultural society, not as a type of nostalgia, but to in order to see how pastoral landscapes were and how the industrial regimes have contributed widely in their collapse. For Hall, pastoral societies are a kind of idealized societies. Therefore, in the novel, she gives readers two visions of society to draw their attention to the fact that human societies are in big danger if such environmental degradations continues to occur.

Developing an “alternative ‘post-pastoral’ vision” (Gifford 5) related to feminist ecocriticism,” Walezek asserts that this strategy enables Sarah Hall “to parallel the exploitation of the environment and the subjugation of women” and

master a "narrative of counter-resistance" to compare between "an alternative agricultural space" (4) and the Carhullan lesbian feminists who separate from the government. Hall calls them in the novel "retro feminists" (*The Carhullan Army* 34). In this context, Walezek hints the link Hall made between women and the land, and Sister's decision to escape to this farming community suggests her returning to the landscape to empower herself. Even before she escapes to Carhullan, Sister walks, narrating,

> Now, once again, I was in that landscape, where human beings had always journeyed to feel less and more significant than they were.
> Where the mountains stupefied and emboldened them, bringing them high and to the edge of what they thought themselves capable. As I stood and looked in the direction of the summits I felt properly dressed in my own muscles, and ballasted by my sense of physicality, as if I belonged outside , away from the crowding, the metered artificial lighting, the ethics of a lost society. *(The Carhullan Army* 29)

What Sister finds in the Carhullan is opposite to her expectations, and the harmonious community led by women, is a flaw society too. Instead of finding a warm welcome and a peaceful society, she was put by the Carhullan women brutally into a dog box for days giving her only limited amount of food and water and testing her limits and power to survive. Sister states, "It was not torture. It was not torture because there was no one hurting me...The only presence in the iron box was my own...They were letting me break apart, so I could use the blunt edges of reason to stave in my mind" (*The Carhullan Army* 48). Sister accepts to live this experience because she considers that it is a kind of cleansing of her inner self after all her

experiences in Rith. After the redeeming treatment, Sister receives from the Carhullan women, she considers herself a new person:

> I knew then that I was nothing; that I was void to the core. To get here I had committed a kind of suicide. My old life was over. I was now an unmade person. In the few days that I had been at Carhullan nobody had called me anything other than Sister, though they had seen my identification card and knew my name, and I had shouted out my story over and over from behind the metal walls of the dog box, trying to engage their sympathies, trying to tell them who I was. The person I had once been, the person who had walked out of the safety zones and up the mountain, was gone. She was dead. I was alive. But the only heartbeat I had was the pulse these women were beating though me. (*The Carhullan Army* 61-2)

From Sister's experience in both communities, it is apparent that Hall's vision of a perfect society is the one built by both men and women, and excluding one of them cannot be a solution. The exclusion of men from this society has given rise to other serious issues, but many attempts have been done to organize the Carhullan community. Responsibilities are distributed among the women in groups, and at the time everything seems peaceful, things start to change.

Indeed, a gradual change starts to take place in the Carhullan agrarian community; it changes from an agrarian society to an armed power as a decision taken by Jackie to fight against the government and cultural stereotypes: "Do women have it in them to fight if they need to? Or is that the province of men? Are we innately pacifist? A softer sex? Do we have to submit to survive?" (*The Carhullan Army* 75). The government becomes a direct threat to the community. Therefore, Jackie decides to gather all the Carhullan women and form an army to fight it, but

just after their attack on a city under governmental control, the novel ends.

The novel ends on a speculative note on the way to overcome both women's and nature's subjugation. Readers are made to think about the best way to liberate both women and nature from patriarchal subjugation. In the novel, the exclusion of men is no longer a solution to build the Carhullan ideal society because Jackie, the leader of this community, uses the same tools to subjugate women since the decisions are taken by her alone. Creating the guerrilla army to fight Rith is Jackie's failed decision that has led to the destruction of the Carhullan society and the breaking of unity among women.

The fighting scenes between the Authority and the Carhullan women are omitted by the writer, giving readers an open end to speculate on what happens to Jackie, the other Carhullan women, and the Authority. However, when Sister gets arrested, she still refuses the governmental authority. She declares,

> We took the town and held it for fifty-three days before the air corps and a regiment of ground forces were called back from overseas and deployed. We executed...three doctors from the hospital, and we destroyed all official records for the Northern territories. There are no remaining carbon prints, or medical files, and the census had been wiped. You will not find out who I am. I have no status. No one does. My name is Sister. I am second in council to the Carhullan Army. I do not recognise the jurisdiction of this government. *(The Carhullan Army* 132)

Through this passage, Sister proves her devotion to Jackie and Carhullan believing

that they are right without recognizing that their attack on Rith brings the collapse of Carhullan. Adam Trexler states that "for climate change in the first place. The gender-driven guerrilla resistance at the end of the novel ultimately loses sight of the contradictions of climate change, reenacting a battle on the familiar terrain of personal freedom and gender relations" (*Anthropocene Fictions: The Novel in a Time of Climate Change* 197). Through this, he hints that the novel reflects the reality of the current world that is running under unsustainability, and the women's fighting alone is not enough. Women's fight, in this regard, means their fighting to liberate the land; they fail because retaining the lands' sustainability is the responsibility of all social groups and not women alone.

For Trexler, Hall blames, in her novel, late capitalism for climate change. He argues: "*Carhullan Army* is noteworthy for the way it shows the climatic conditions on which Britain's markets and political order depend, but its historiography problematically assumes that any alteration from late capitalism must lead to a Soviet-tinged authoritarianism. This historical interpretation is even more problematic, given that late capitalism is blamed" (196). In his analysis of the novel, Iain Robinson agrees that late capitalism has to be blamed for climate environmental crisis. He argues that, "The totalitarianism depicted in *The Carhullan Army* is one that has emerged not from communism but from a collapse of late- capitalism" (199). Robinson considers that what Hall envisages in *The Carhullan Army* is "a regression

from present circumstances," (198) that are the outcomes of contemporary society, which fails to manage its resources, and this has led to climate change. Robinson also explains that Hall describes two different communities, Rith and Carhullan, identifiable with the architecture and geology of Cumbria; they become "unfamiliar by the drastic experiments in civic organization and changes to flora and fauna brought about by global warming. For her, *The Carhullan Army* is Hall's "attempt to imagine possible futures that might emerge from the kind of environmental and economic catastrophe...as the potential outcome of our present circumstances" (200).

Through the use of ecofeminism, this chapter centers particularly on analyzing the relationship between female characters and the environment they live in, highlighting Hall's presentation of climate change and environmental degradation. In the novel, Hall depicts a post-apocalyptic world where women and nature suffer in a collapsed society because of environmental, political, economic, financial, societal, and global warfare oppression. She shows how women's and nature's subjugation should be fought together and how women should explore and recover their identity in a repressed society. She considers that the domination of nature and gender domination stem from patriarchy. Thus, through the novel, she calls for oppositions against patriarchy through the unification of feminist and ecologist principles to liberate both women and nature. Moreover, like ecofeminists, Hall in the novel enables her female characters to have the same roles and occupations as men. They fight back to gain their rights and get their freedom. They

are also sown as able to play a very important role in solving the environmental global crisis from a social gender perspective. Therefore, according to her, the true progress in society should be built up on diversity of individuals and cultures working together to solve environmental problems.

To sum up, the analysis made in this chapter has shown that climate change does not only have scientific geological dimensions; it has also cultural, political, psychological, economic, and social dimensions. Margaret Atwood transmits her outlook concerning the Anthropocene in *Oryx and Crake* through portraying two disastrous global calamities, climate change and a deadly virus similar to Coronavirus that kills human beings in large numbers. Through the imaginary world she portrays, she claims that climate change and environmental degradation lead to the loss of nature and the appearance of deadly viruses. Through her novel, she shows how the basis of human beings' health and their well-being is a healthy planet, aiming to raise the awareness of her readers about the consequences of their anthropogenic activities. In *The Carhullan Army*, Sarah Hall too criticizes the polluted society in which she lives, through the representation she makes of climate change and environmental degradation. She applies ecofeminist views and principles in her story, highlights the tight link between the Anthropocene and women.

Through her novel, Sarah Hall tries to transmit her message to the whole world that her society is just a microsom of what is happening in all parts of the

world. In order to raise the awareness of her readers, she depicts examples of natural disasters that can emerge from human beings' anthropocentric consumerism. Through the application of ecofeminist principles, she shows that a coexistence of women and nature is necessary in order to create an equilibrated life, and that the absence of any of them means the absence of the other since both of them share this quality of birth giving, and the association of both helps to celebrate women's spirit.

Chapter Three: The Effect of Climate Change on Language

In the four selected novels of this study, language plays a significant role in making readers aware of climate change and environmental degradation. It is through language that the four writers expose realities about climate change, aiming to raise people's awareness about its danger and to hint for reliable solutions to solve environmental issues. In the novels under study, Ian McEwan, Marcel Theroux, Margaret Atwood, and Sara Hall all agree on the fact that climate change is a human-made phenomenon that has led to environmental degradations, or in other words, to the loss of nature. Thus, the core question for this section is: Does climate change lead to the loss of language as well? In *Solar*, McEwan shows that climate change leads to the appearance of a comic nihilist language whereas Theroux, Atwood, and Hall offer another completely different perspective. They suggest an alarmist repertoire that climate change does not only lead to nature erosion but to language erosion as well.

I- Rhetorical Language in Ian McEwan's *Solar*

In McEwan's *Solar*, McEwan shows how climate change as a global issue reveals the failure of human communication to collaborate and solve such global issues. Further, he even shows the failure of scientific discourse to solve it. Through his novel, he asserts that climate change as an outside world issue helps to reveal the inside world of human beings, their selfishness and personal interests. Through the

novel, McEwan insists on the role of language to communicate and solve this global issue. His work "is understood as a form of environmental writing, a text that passes ecological tenets through rhetorical, linguistic and cognitive strategies" (Soloshenko 147). So what type of language does McEwan present in *Solar?* How does he depict the influence of climate change on language?

As discussed in the fourth chapter, McEwan's *Solar* tackles the issue of climate change as an ethical dilemma set in the present rather than an environmental disaster set in the future. It depicts the way poor ethics lead to a poor language to communicate climate change, the cause of human beings' failure to solve the problem of climate change. According to McEwan, climate change does not only lead to degradation of the non-human world, but it also leads to degradation in the human language.

McEwan depicts the effects of climate change on language through the life of his character Michael Beard. The narrative progresses, not only to reveal the world's climate and global politics, but the protagonist's climate change discourse as well and how it changes according to the protagonist's evolution in time . In "Metafictionality, Intertextuality, Discursivity: Ian McEwan's Post-Millennial Novels," Zdenek Beran affirms that in *Solar* McEwan pays special attention to the discourse used in his novel to communicate the issue of climate change. He argues

that, “the novel is not just a satire on modern science and its corruption by commercialization but also a reflection of “ontological relativism” as a product of prevailing contemporary discourse formations” (123). In the novel, he shows how the failure of communicating and solving the problem of climate change leads to disaster. In fact the climate change crisis reveals facts not only about the outside world but also about the inner self of the skeptical character, Michael Beard. Therefore, the analysis will be devoted to focus on his rhetorical skeptic language, and how he deals with the threat of climate change in a humorous way. In addition, through Beard, McEwan considers that a scientific solution to climate change and environmental degradation is not enough; it should be reinforced by powerful language to engage in the debate, convince, and influence people, especially scientific and political decision- makers to act quickly and save the planet.

In “Warm Words: How Are We Telling the Climate Change Story and Can We Tell It Better,” Gill Ereaut and Nat Segnit define British comic nihilism as follows; it is an “evasive rhetorical repertoire. Its rejection of climate change is whimsical, unserious, blithely irresponsible - a sunny refusal to engage in the debate, typified by comic musings on the positive possibilities of a future with climate change” (8). The definition provided in his quote is very significant; the critics highlight the characteristics of this repertoire where the focus has been put on the form rather than the content.

This repertoire rejects climate change as a factual issue, depicting a category

of people who are deniers to climate change; they express their ignorance through their ironically whimsical, unserious, and irresponsible debates about global disaster. However, the authors in this article consider that this repertoire is "currently marginal, seen in just a few places in the middle-class press and radio. But it is potentially important because it is a very British repertoire (selfmocking and contrary, dealing with adversity and threat by use of humor) and a very middle- class one, which could be important if agencies choose to address a middle-class or professional audience" (8). In the novel, Michael Beard uses an outmoded language; he uses British comic nihilist language, an unserious language, to tackle the serious issue of climate change while he is supposed to be the only mind able to solve the problem of climate change in the novel.

For Beran, Beard's scientific mind, "...is not subject to a rigorous skepticism inherited from the Enlightenment, but rather to pure personal profit inspired by the period of *laissez-faire* capitalism. Instead of facing problems he is permanently running away from them" (Beran 127). In order to construct a new type of narrative and provoke a climate change debate, McEwan has presented real science and real facts in an imagined world. Monica Cojocaru sums up McEwan's difficult task to tackle this issue in *Solar* by considering that,

> The difficulty of finding a balance between the narratives of science and those of fiction, between small, local practices and global, all encompassing concepts, is precisely what the novelist tackles in *Solar* (2010), in an attempt to raise environmental and

> ethical awareness, inciting an ecocritically informed reading of the novel.
>
> (Cojocaru 346)

According to Cojocaru McEwan, in *Solar*, focuses on small and local practices, meaning that he tests the practices through one character, Michael Beard. He follows all the details of his life to deduce the type relationship he has with the environment to be able to generalize to humanity as a whole. Through this literary method, he aims to raise awareness about the degradation of both environment and human ethics, stating it in a chain of cause and effect. For him, the loss of human ethical culture leads to the loss of environment and the appearance of climate change crisis.

Cojocaru , on the other hand , refers to the techniques used by McEwan in order to highlight "the moral dilemmas that result from contingency, indeterminacy and the complexity of the human experience" (347), mainly the use of a mini-narrative, a distinguished type of narrative, that helps the author to "emphasise the lived experience and explain small practices, local events, rather than 'grand narratives' and all-encompassing concepts" (347). Through the ethical dilemma Beard lives, the reader is given a very practical role to investigate the environmental awareness' message McEwan wants to transmit because Beard, as a flawed character, complicates the task of readers.

McEwan insists on the role of literature to help in solving even scientific

ecological issues as climate change. He mingles scientific facts with fiction, unifying science with humanities, in order to make his readers aware of the seriousness of the issue of climate change. According to Cojocaru, McEwan,

> manages to register a moral impact upon his readers, by calling into question the effectiveness of science as an exclusive model of knowing and ultimately showing that neither science nor emotion alone can offer an adequately broad understanding of the world.
> The novelist creates characters who are proven wrong for exclusively endorsing one side of the conflict, thus entering into the two cultures debate and challenges the significance of science in a dehumanised, globalised, consumerist society. The outcome is a cogent testimony of the impossibility of any scientific explanatory pattern to elucidate quotidian disorientation and personal trauma. (351)

In *Solar,* McEwan insists on the role of literature to help in solving even scientific and ecological issues as climate change.

In "A Dirty Hero's Fight for Clean Energy: Satire, Allegory, and Risk Narrative in Ian McEwan's *Solar*" Evi Zemanek argues that Ian McEwan presents climate change in a new form of eco-fiction and introduces for the first time the term "satiric-allegorical risk narrative" of a dirty hero who fights to create clean energy. Zemanek hints to the fact that instead of depicting a dystopia or a post-apocalyptic narrative like the other climate change narratives discussed with the other case studies in this research, McEwan presents climate change as a global risk reflected through the anti-hero Beard and his reckless personal life.

Instead of the environmental scenario, Zemanek believes that in *Solar* "the apocalyptic scenario is downsized and transposed into the private life of the protagonist and horror is replaced with humor...unlike the usual risk narratives that involve secularized apocalyptic rhetoric and scenarios, or, alternatively, rest upon allegory and employ the satiric mode" (58). For her, climate change and environmental degradation, in *Solar*, lead to the appearance of 'risky' discourse. The term 'risky' is preferable to the term, 'danger,' which can result from "disasters that cannot be prevented," or "the actual event of damage" (52). This risky discourse is used to portray a risky scenario in *Solar*, illustrated mainly through the main character, Beard, who uses it in two main situations: explicit indications to refer to climate change and to his private life, referring to the various risks he takes as a scientist, a man, a husband, and a lover:

> McEwan artfully ridicules Beard as the protagonist of a satire that scrutinizes a certain type of scientist as well as a certain type of man, husband, and lover. Thanks to the many comic and humorous elements, the taking of individual, voluntary, familiar and often trivial risks is apparently quite pleasurable for Beard. But read allegorically with reference to the collective, involuntary and unfamiliar ecological risk, this satirical portrait demonstrates the consequences of inadequate risk perception and disastrous risk management. (Zemanek 58)

McEwan does not raise his readers' awareness through "negative examples" taken from the natural outside world of Beard. Instead, he prefers to find their reflections and effects in Beard himself and his inner world, meaning that the negative effects of climate change do not harm the environment alone, but the inner human beings'

world is damaged too.

During the Anthropocene era, human beings' behavior and attitudes towards nature have shown their anthropocentric view that nature is only a means to realize their material desires, neglecting totally the biocentric view that the Earth is the Mother of all. Human beings have not only destroyed nature but themselves too, and this anthropocentric view is portrayed through Beard. Instead of using a denial, sceptic, or calamatist discourse, Beard's rationality leads him to use the discourse of a warner. In many parts of the novel, the same rhetoric strategy is used by him; instead of using horror discourse to present essential information about the causes and consequences of climate change, he depicts them through a light discourse, "as commonplace" (Zemanek 53), indicating a big ambiguity in the speech of a scientist. He uses this type of ecological risk discourse referring to the "general without being able to disprove the actual prognoses" (Zemanek 53) to profit from it and realize his own subjective objectives. "He mocks the risk discourse that is not just prevalent in the mass media, but also in scientific papers. His tone not only shows the indifference of the confident egoist, but also his professional habituation to risk (53).

Beard, who is trying to promote a technology for artificial photosynthesis, gives the following speech to a group of pension fund managers:

> The basic science is in. We either slow down, and then stop, or face an economic and human catastrophe on a grand scale within our grandchildren's lifetime ... How do we slow down and stop while sustaining our civilisation and continuing to bring millions out of

> poverty? Not by being virtuous, not by going to the bottle bank and turning down the thermostat and buying a smaller car. That merely delays the catastrophe by a year or two ... Nations are never virtuous, though they might sometimes think they are. For humanity en masse, greed trumps virtue. So we have to welcome into our solutions the ordinary compulsions of self-interest . and the satisfaction of profit. *(Solar, Pdf)*

Beard's language in the above mentioned speech shows the deterioration of his language from a language of a scientist to the language of an ambiguous person who prioritizes his greedy self and his self-interests to the solving of climate change problems. When he starts to be aware of the danger of climate change, his language starts to be altered and his discourse to change due to his maturity, starting from the expedition till his illness, meaning that change in climate leads to changes in culture, society, politics, economy, ethics, and language, showing how his language has changed due to his maturity, starting from the expedition till his illness.

Accordingly, McEwan, in the novel, develops a narrative that presents the anthropogenic environmental degradation as the result of human unlimited technological ambition:

> *Solar* presents science as comedy in order to mock human belief in salvation through technological advancement. The novel demonstrates McEwan's turn to "social satire," which critics identified as a "new departure" in his writing in the twenty-first century. (Berndt 98-9)

McEwan, in fact, uses metanarrative for science, portraying a scientific discourse to show his incredulity about the various international summits conducted to solve the

global warming issue, for example, the Copenhagen talk on global warming. According to him, the failure of these talks is due to the failure in the language of communication.

As shown in the fourth chapter, in *Solar,* the representation of climate change and environmental degradation takes the form of "an environmental comedy" (Lehtimaki 87), where the protagonist, Beard the scientist, who normally suggests solutions to solve the problem of climate change, is proposed to save the planet through the creation of a new energy source, which is solar energy. In this regard, Beard prioritizes his own greed over the planet; he exploits this project to realize personal achievements. The reader discovers such facts about Beard through the language he uses, and the whole irony in the novel is summarized in this metaphor; saving the world for him is saving his own skin; the damage of the skin symbolizes the damage of the planet. In his article, "A *Comedy of Survival: Narrative Progression and the Rhetoric of Climate Change in Ian McEwan's Solar f* Markku Lehtimaki traces the progress of the character of Beard. Lehtimaki notes that in *Solar* narrative Beard's character has progressed both negatively and positively because the novel contains two modes, comic and tragic. He writes that, "Beard's body collapses while his ethical vision matures, and in the global discussion, climate change develops from an apocalyptic story into an aching reality" (87-8).

Lehtimaki insists on the role the apocalyptic genre plays to tackle climate

change and the danger it may lead to. In reality, following Beard's character requires investigating the rhetorical narrative, which is according to Markku Lehtimaki built on "complex negotiations" to answer two fundamental questions to discuss climate change First, how does the novelist's traditional toolbox approach a problem of such global proportions, and second, should we even look to fictional narratives for answers to real environmental problems?"

In the novel, Beard presents a rhetorical skeptic language as if he is a non-expert who just gives pseudoscientific knowledge collected from academic and scientific resources while he is supposed to be the man in charge of solving a serious worldly environmental problem. The background of Beard makes the reader anticipate the solution he is would give because his current life reveals how he is far away from the issue and how it is of no interest to him. He is described as an anti-hero, a flawed character; though he wins a Nobel Prize in physics. The narrator describes him as a pseudo-physicist. He lives his life in absurdity. He does not have the qualities of a scientist; he is overweight, short, and balding, and whose only concerns are his appetite and his instincts. He cares only for food, women, and money and does not succeed in any of his five marriages. As the novel indicates from the beginning; he is obsessed by his previous wife, Patrice, and her relationship with Rodney Tarpin,

> Beard is an unremarkable, unattractive, middle-aged man. He is defined by his gluttony, growing alcoholism, and an extraordinary capacity for constructing a life around a series of fragile lies, which

> do eventually erupt. He lacks genuine environmental concern, as comically captured here, 'in fact, greenery in general - gardening, country rambles, protest movements, photosynthesis, salads - was not to his taste.' *(Solar, Pdf)*

In a car journey, Beard suddenly finds himself sharing ideas on climate change and the solar energy project with Aldous who is very interested and motivate to solve this issue. However, Beard finds discussing climate change boring. Even his decision to join an expedition to the arctic has been taken more out of curiosity than interest. "Beard was not wholly skeptical about climate change. It was one in a list of issues of looming sorrow, that comprised the background to the news, and he read about it, vaguely deplored it and expected governments to meet and take action" (*Solar, Pdf*). Readers are, thus, given the chance to speculate on the effects of climate change through Beard, the protagonist himself, and the speeches he gives about climate change in an ironic way.

Beard's speeches are rhetorical, focusing only on the form and neglecting the content, which is more important for tackling climate change. His language builds its arguments by form rather than by scientific facts and content. With Beard's content, the language of climate change becomes "religious,"

> Other themes flourished symphonically: what was to be done, what treaties were to be made between the quarrelsome nations, what concessions, what gifts should the rich world self-interestedly make to the poor? In the mess room's humid after-dinner warmth, it seems to the owners of full stomachs sealed with wine that it was only reason that could prevail against short-term interests and greed, only rationality could draw, by way of warning, the indistinct

> cartoon of a calamitous future in which all must bake, shiver or drown. The statehood-and-treaty talk was worldly in comparison with another leitmotiv that summoned a cooling measure of austere plainsong, a puritanical air from the old conservation days, distrustful of technological fixes, determined that what was required was a different way of life for everyone, a lighter tread on the precious filigree of ecosystems, a near-religious regard for new rules of human fulfilment in order to flourish beyond supermarkets, airports, concrete, traffic, even power stations - a minority view, but heard with guilty respect by all who had steered a stinking snowmobile across the pristine land. (*Solar, Pdf*)

Beard's speech reflects his self-interest that is the material he would gain from the project. He makes efforts to convince the audience with something he does not care about.

Therefore, Beard continues talking in prospect and using words, such as, golden days, "These are golden days in the global markets and sometimes it seems the party will never end" (*Solar, Pdf*). In addition, he even uses others' words and ideas to tackle the issue of climate change as when he uses Aldous's words as his own:

> If an alien arrived on earth and saw all this sunlight, he'd be amazed to hear that we think we've got an energy problem. Photovoltaics! I read Einstein on it, I read you. The Conflation is brilliant. And God's greatest gift to us is surely this, that a photon striking a semiconductor releases an electron. The law of physics are so benign, so generous. And get this. There's a guy in a forest in the rain and he's dying of thirst. He has an axe and he starts cutting down the trees to drink the sap. A mouthful in each tree. All around him is a wasteland, no wildlife, and he knows that thanks to him the forest is disappearing fast. So why doesn't he just open his mouth and drink the rain? Because he's brilliant at chopping down trees, he's always done things this way, and he thinks that people who advocate rain-drinking are weird. That rain is our sunlight, Professor Beard. It drenches our planet, drives our climate and its life. *(Solar, Pdf)*

After a while, Beard himself confesses that he is a liar with no optimistic views, and his speeches do not have any effect to change realities about climate change as to use words, such as, “warming is good.” While saying that, he heard dismissive whispers from his audience in the room. However, Beard’s language to communicate the issue of climate change is highly rhetorical. It is an attempt from the writer to convince his readers to start thinking about a sustainable life on the planet.

Through the novel, Ian McEwan suggests that the solution to climate change is a type of new energy source; he proposes solar energy. However, for him, this solution will be workable only in one case; when human beings really understand their inner elves before understanding and mitigating with nature; understanding their nature is the first key to solve the issue of climate change and the various environmental problems it has led to. Therefore, he considers art as a good way to help in understanding human nature. Though he has portrayed his protagonist, Beard, as an anti-hero with many shortcomings, he has made him attempt to convince his different audiences/ readers of the importance of the application of the photosynthesis project for the well-being of humanity.

II- Language Erosion in Margaret Atwood's *Oryx and Crake,* Marcel Theroux's *Far North* and Sara Hall's *The Carhullan Army*

McEwan's *Solar*, as we have seen in the previous section, discusses the idea that climate change reveals the failure of human beings to communicate and solve this issue. Margaret Atwood's *Oryx and Crake,* Marcel Theroux's *Far North* and Sara Hall's *The Carhullan Army* demonstrate, as it will be shown in the present section, the way climate change and environmental degradation impacts language itself. The three novels depict the way degradation of the landscape leads to the degradation of language. The loss of the land leads to the loss of the language, and living under new territories requires the birth of new words to communicate with the land. Therefore, in their depicted post-apocalyptic worlds, Atwood's *Oryx and Crake*, Theroux's *Far North* and Hall's *The Carhullan Army* reveal that the multiple climatic changes alter the relationship between the characters and the environment they live in; they feel the necessity to use new words instead of the old ones because they are erased as the loss of the land itself, showing an alarmist climate change repertoire.

Alarmism is defined by Gill Ereaut and Nat Segnit "as awesome, terrible, immense and beyond human control" (7) because climate change and environmental degradation become observable and are seen everywhere. The two critics consider that the alarmist repertoire is mostly constructed by climate change. According to

them, this climate change repertoire is distinguished from other repertoires by an extreme lexicon that incorporates “an urgent tone and cinematic codes” in order to stimulate society in general to start acting urgently to stop this environmental crisis; therefore, they use “we, today” (13). In addition, this climate change repertoire, “employs a quasi-religious register of death and doom, and it uses language of acceleration and irreversibility”, including words, such as, judgment, heaven and hell, ‘catastrophe’, ‘chaos,’ ‘rapid,’ and ‘havoc’ (13) in order to increase people’s awareness about its danger to act seriously and momently. Therefore, as suggested by Gill Ereaut and Nat Segnit, metaphors, omens or predictions of violence, revolts and war "extend the physical threat into a societal threat: ‘the breakdown of civilisation’" (13).

Both Theroux and Atwood agree that climate change and environmental degradation may have a big influence on language, believing that the degradation of the climate leads to the degradation of language. They speculate that climate change does not only cause the loss of the land, but it also causes language erosion. Therefore, in their novels, they guide the linguistic process that relates the main characters to the environment they live in, and their narratives witness different changes in terms of word-formation.

Through this novel *Oryx and Crake*, Margaret Atwood tries to raise a very

important question about the role of language, literature and more significantly the human ability for symbol-making to deal with climate change and think about how to solve it. For her, the disappearance of language and the production of new ones reflect the way environmental destruction affects humans as both an ecological and linguistic crisis. The collapse of civilizations leads to the loss of language. The loss of language leads to the appearance of a new kind of vocabulary.

As for Marcel Theroux's dystopian work, the concern of the novel lies in the appearance and disappearance of words when Makepeace is far away from her original environment. He shows readers that climate change affects and alters language, showing readers the deep linkage between language and nature and how climate change can affect and make a change on language. Marcel Theroux presents climate change and environmental degradation through the loss of the land and the loss of civilization that lead, consequently to the loss of human beings and their language. The serious effect of climate change on language according to him is the disappearance of words. In a world where civilization is lost, Makepeace tries to keep written language through preserving books. Makepeace explains: "I buried them together in a grave I dug to the south of the city. The place sits in a ring of birches where the old Fourways Crossing used to be. I set them there in a larchwood box and rolled a white rock over it for a headstone, but I couldn't bring myself to write words on it" (*Far North*) Astrid Bracke's interpretation of the idea of

preserving books in climate change fiction is that the loss of books leads to the loss of civilization which means the loss of culture and language. She sates that , "The destruction of books is not a mere material fact in these works, but intimately tied in with the wider collapse of (Western) civilization, as such suggesting a connection between the two: the loss of books, these novels propose, will lead to a wider collapse of civilization" (5).

Theroux, in the novel, depicts the way the loss of the land has led to the loss of words and the creation of new ones, through the relationship between Makepeace and her friend Pink. Makepeace tries to find new ways to communicate with her friend Pink and be understood by her. She says in this context:

> Ping and I were beginning to find ways to talk to each other. I never had much of an ear for her language, but we had 'chai' for tea, and 'dinner' for pretty much every mealtime, and a bunch of other words that helped simplify our life together, though we were a way off discussing politics or sharing our life stories - which suited me, in fact. (*Far North*)

In another context, Makepeace refers to the loss of language when she states: "I had stopped getting orders from anyone a long time before that" (*Far North*). This hints to the existence of hope somewhere to find life and language where nature still exists. The burying of nature resembles the burying of her parents and that of language. She desperately says:

> I had always hoped that in the other towns to the east there was still

> some kind of lawful life being led. That was my consolation as first I buried pa, and ma, and Anna, and then Charlo, and the life we had known seemed to pass and be forgotta cike an old tune nobody sings anymore. Maybe here it's especially bad, I used to think. Or someone's forgotten about us. But away from here, the old life continues. (*Far North*)

The human tongue instead of uttering language seems to have another role to play, "I hauled myself out of the drain and clucked my tongue to bring the mare back from out of the sheds. They must have berthed the caravan here when they came through in January, corralling the women in here, out of the weather" (*Far North*).

In *Climate Fiction and Cultural Analysis: A New Perspective on Life in the Anthropocene,* Gregers Andersen states that to describe this post-apocalyptic world, Theroux uses the story of Babel; he includes it into the novel's plot to make a comparison between the disappearance of Babel and the world he depicts in the novel. In her description of the new world she finds herself living in, Makepeace mentions, "world had gone so far north that the compass could make no sense of it" (*Far North*). The loss of this world has led to the loss of its language. Marcel uses this example to support his alarmist vision about the decline of both nature and language if climate change continues to occur. In fact, the novel claims a breakdown in human communication, and this is illustrated at the beginning of the novel in a conversation between Makepeace and Ping when Makepeace confesses that: "It was clear that we didn't have a common language. There are some tongues where you can get, say, one word in five or ten, and it's enough to make some sense of one another. We had nothing" (*Far North*). Later, Makepeace shows her worries about

the alteration in the meaning of some words because of the deterioration or disappearance of the objects that are signified by them:

> She hopes that it might prevent a certain loss of meaning: We had been so prodigal with our race's hard-won knowledge. All those tiny facts inched up from the dirt. The names of plants and metals, stones, animals and birds; the motion of the planets and the waves. All of it fading to nothing, like the words of a vital message some fool had laundered with his pants and brought out all garbled. (*Far North*)

The loss of the land brings with it the loss of language, and Makepeace becomes aware of this loss. Changes in languages occur in terms of pronouns, and this creates a distance between her and her environment. Because of the absence of the language, she becomes unable to perceive her environment. She reveals,

> The stars once had names, every one, and once shone down like the lights of a familiar city, but each day they grew a little stranger [...] The sky was becoming a page of lost language. Things as a race we'd and named forever were being blotted out of existence. Once these rivers all had names, the hills too, maybe even the smaller dinks and folds in the pattern of the landscape. *This was a place once,* I thought. (*Far North*)

Language erosion makes Makepeace feel more alienated and isolated in her landscape. "'Once these rivers all had names, the hills too, maybe even the smaller dinks and folds in the pattern of the landscape' (*Far North*). She is unable to give names or to remember the names of the elements of nature around her. The other fact concerning the erosion of language in *Far North* is when characters are put in specific situations to provide themselves with necessary associations; for them the

surroundings become insignificant without naming.

In her depiction of the effect of climate change on language, Margaret Atwood, for her part, poses other realities about the link between the environment and language. Atwood agrees with Theroux about this major effect. She, also, makes her characters aware of the relationship between alterations made in environment and the ones happening to language. Atwood, too, acknowledges the relationship between ecology, human beings, and language.

In her thesis, *Eco-Fiction: Bringing Climate Change into the Imagination,* Sophia David states,

> Variety is vital within ecology, yet it also vital for meaning in words and the prosperity of selfhood. We can find parallels to this mechanism in the functioning between language, self and ecology. In ecology the extinction of a species impacts upon the rest of its environment and can lead to a domino-like elimination of creatures, plants and habitats. (81)

The passage hints to the importance of ecology or in other words ecosystems in general in the life of both the human world and the non-human world, and the loss of environment gradually leads to the loss of the human being and his language. In the novel, Atwood depicts the way the loss of nature goes leads to the loss of language and makes her characters aware of the cause-effect relationship between the two. The more the environment shrinks and degrades, the more the characters are aware of the loss of their words.

The protagonist, Jimmy, lives such an experience when he feels the artificiality of his new surrounding world. "What's happening to his mind? He has a vision of the top of his neck, opening up into his head like a bathroom drain. Fragments of words are swirling down it, in a grey liquid he realizes is his dissolving brain" (*Oryx and Crake* 75). The novel contains many passages portraying the way Snowman tries to maintain his vocabulary through the memorization of words:

> He memorized these hoary locutions, tossed them left-handed into conversation: *wheelwright, lodestone, saturnine, adamant.* He'd developed a strangely tender feeling towards such words, as if they were children abandoned in the woods and it was his duty to rescue them. *(Oryx and Crake* 99)

Memorizing such words is very important while the environment surrounding Jimmy is declining; he tries to preserve old words by listing them in terms of meaning. The narrator describes Jimmy's process by stating, "He compiled lists of old words too - words of a precision and suggestiveness that no longer had a meaningful application in today's world...'' (*Oryx and Crake* 99). Jimmy preserves them because they are in a danger of disappearance and be replaced by new ones as suggested by the narrator, "From nowhere, a word appears: *Mesozoic.* He can see the word, he can hear the word, but he can't reach the word. He can't attach anything to it. This is happening too much lately, this dissolution of meaning, the entries of his cherished wordlists drifting off into space" (*Oryx and Crake* 20).

Jimmy suggests that the absence of the environment makes words lose their

sense; their existence in their real context is vital to refer to them, “But there was no longer any comfort in the words. There was nothing in them. It no longer delighted Jimmy to possess these small collections of letters that other people had forgotten about. It was like having his own baby teeth in a box ...” (*Oryx and Crake* 133). Jimmy's experience in this destroyed world teaches him that without signified, signifiers lose their function and meaning. Without the environment, they can neither compare nor contrast objects or things in the absence of benchmarks. The narrator observes that “he doesn’t know which it is, bigger or smaller, because there’s nobody to measure himself by. He’s lost in the fog. No benchmarks” (*Oryx and Crake* 122).

The third novel that tackles an alarmist repertoire, in the present research work, is *The Carhullan Army.* In the novel, Sarah Hall expresses the loss of words through the appearance of new ones in the use of the female utopia. According to her, Rith, the dystopian patriarchy society includes only words of discrimination, pollution, and order. On the other hand, the more the female body is far away from this patriarchal environment, the more words linked to patriarchy disappear to be placed by other ones which are connected more to farming and landscape. Therefore, Hall shows a big interest, in the novel, to the way man should reconstruct language to modernize its discourse to be fair to women and closer to all forms of nature. Through this, she stresses the role of women’s experience in ecological movements and their share in solving environmental problems.

According to Astrid Bracke, “The novel as a whole, and flood fictions in particular, provide a rich terrain to explore climate crisis.. .flood fictions utilize the full potential of the novel to expand the form itself while—importantly—providing readers access to characters and worlds.” (7-8). Hall’s representation of climate change is based on portraying floods as an effect of environmental degradation that leads to the destruction and erasure of “iconic structures,” “future ruins” including even buildings (Bracke 4). For Sarah Hall, such destruction of nature makes of Rith a fragmented city even in terms of narrative while the erosion of soil causes an erosion of language. She believes that the representation of climate change requires new types of narratives. Through such narratives, authors find a room towards creating stories to make readers feel the negative impacts of climate change and their awareness is raised for urgent actions. In the novel, Sister says that “Not long after that, the Thames flood barrier had been overwhelmed and tidal water had filled the building” (*The Carhullan Army* 71). The floods, and the destruction they have caused to the village, become for the writer, “the ruins of our contemporary society". Future ruins will include even language.

Indeed, in *The Carhullan Army*, floods do not lead only to the destruction of the city but to the break apart of language as well. Hall uses literal fragmentation of narrative and language in this novel as a powerful tool to depict both the collapse of the city and the loss of language. She varies, accordingly, the structure of her novel

through the use of "a series of records, some complete, some partly destroyed, in which Sister talks about her life at Carhullan and, in sparse detail, and about the attack on Rith at the end of the novel. In *"Landscape and Identity: Utopian* /Dystopian Cumbria in Sarah Hall's The Carhullan Army," Emilie Walezak states that Sister's old words disappear in her new farming world; instead, she uses dialects related to agriculture, the Northern and Scottish dialects. This includes words, such as, "cattle bothies, the bields, or the expression "speaning the lambs." "For a minute or two I stood in the village. It was deserted as I'd expected it would be. The slate cottages were dark. They looked cold and hollow now, like cattle bothies (*The Carhullan Army* 17). Sister uses new words to contrast her new life with what left in Rith as if she does not feel the need to use her old language/ words anymore and thinks of changing her repertoire completely. She wants to replace it with another pastoral one that is harmonious with nature,

> As we approached the farm a ripe smell of silage began to grow stronger. It was an odour both offensive and rousing; that got right to the back of my nose and throat and smelled of decayed grass, fish and animal waste. The pungent tang of husbandry had long since been gone from Rith. Instead the air was filled with petrochemical emissions and the rot of uncollected rubbish. The agricultural spread held faint memories of the county in its old incarnation at this time of year, with sprays of yellow fertiliser jetting over the earth and heavy, silted tractors working behind the hedgerows. *(The Carhullan Army* 43)

Walezek comments on the use of such expressions as "a ripe smell of silage" or "the pungent tang of husbandry" in the above passage by saying that these are "pastoral" words used in the novel by Sister as "an opposition between the country and the

urban" (4). She also adds that the aim behind the use of such pastoral expressions is "to contrast" them with the "bacterial smell of the refinery and fuel plant." (4)

In the present chapter, the main focus has been on the ways climate change and environmental degradation can affect human beings' life. The analysis made in this chapter indicates that there is a link between language and climate, and if any alterations happen in climate, they would lead to changes in the human language. Changes in biological ecosystems lead to changes in linguistic and cultural codes. In the four selected novels, climate change is presented through language, and the collapse of nature is presented through the collapse of language, portraying the deep nature of the relationship between human beings and nature. The selected writers depict, in their works, the strong relationship between nature and civilization, assuming that civilization is built on nature, and that the loss of nature leads to the loss of civilization. This leads, as a consequence to the loss of Man and his language. While Ian McEwan hints in his work to the fact that climate change as an ecological crisis causes a crisis in communicate, Marcel Theroux, Margaret Atwood, and Sarah Hall consider that climate change and environmental degradation lead to the loss of language and the creation of new linguistic processes.

Conclusion

This second part of the thesis has discussed the various representations of climate change and environmental degradation in the four selected novels. The analysis has shown that Ian McEwan, Marcel Theroux, Margaret Atwood, and Sarah Hall have tackled this issue from different perspectives although it is considered as a major concern in their novels. Indeed, although their narratives seem different, they all agree that climate change is a real problem, which has become observable, felt, and lived. Through their novels, these writers criticize individuals, societies, and the whole world about such change in the climate and its devastating effects that have led to other environmental degradations. In *Solar,* change in climate is represented through a flawed scientist's dilemma which goes along with a rhetorical language; in *Far North*, it is represented as the cause that has led to the collapse of human communication or the human civilization in general. In *Oryx and Crake*, Atwood has forecasted Covid-19 and the extinction of all humanity while in *The Carhullan Army*, Sarah Hall considers the flooding that hit Britain as representatives of women's oppression..

CONCLUSION

The rise of the Industrial Revolution during the eighteenth century has had negative impacts on human being's life in general and the environment or the natural world in particular. The multiple scientific and technological developments have helped to gain wealth and realize social development; however, they have been accompanied with harmful environmental results, mainly climate change and environmental degradation. The application of ecocriticism and ecofeminism in this research has helped to analyze the various representations of climate change and environmental degradation in the four selected contemporary novels, Ian McEwan's *Solar,* Marcel Theroux' *Far North,* Margaret Atwood's *Oryx and Crake,* and Sarah Hall's *The Carhullan Army.*

In the first part of this research, the provided theoretical background has helped to trace the development of environmental writings in literature. Therefore, attempts have been made to define environmental literature, or British environmental literature in general and climate fiction in particular, mapping its historical roots to science fiction, the age of science and the Industrial Revolution, which brought with them the first seeds of the environmental crisis.

The first chapter of this part has shown the way the Industrial Revolution led to the transformation of the British society from a rural society to an urban one; ultimately, this has led to the raise of new themes in literature, such as,

environmental degradation, urbanization, and workers' alienation.

The first chapter has also evoked Romantic writers and the way they imagined the negative results of the emerging environmental crisis that was sweeping British lands. Romantic writers, who were skeptical about science, reacted against the scientific rationalization of nature and against the exploitation of the natural environment, prioritizing nature over industry. They produced literary works as a response to the disappearance of the wild and pastoral areas, which were replaced by urban and industrial ones. Thus, as a departure, various representations were made of nature as a way to cope with the sweeping degradation in environment. The Romantic writers gave a very important role to language to reflect their environmental awareness, developing narratives that conveyed in general the main message that the death of nature would lead to the death of human beings. In this chapter, more emphasis has also been put on the emergence of a new subgenre in science fiction, which is climate change fiction, as a new form of environmental literature because of the global spread of climate change and environmental degradation.

The second chapter of this part, on the other hand, has provided the definition of both ecocriticism and ecofeminism. It has shown that these new literary approaches have appeared as a reaction to the multiple environmental literary and cultural studies that were made during and after the 1960s. Based on ecology and

ecological concepts, ecocriticism tends to examine the representation of the degraded nature in literary works, reflecting the relationship between the human being and his environment; his misuse and exploitation of the environment have led to environmental degradation, and above all , to climate change. The chapter has shown that for the sake of protecting the environment, the aim of both environmental writers as well as ecocritics has been directed towards finding solutions to such ecological issues both locally and globally. It has investigated the multiple representations given to this environmental crisis in the literary works, which have helped in the emergence of the British climate change novel. It is as also shown that the outer ecological environmental crisis, according to these literary works, is the result of an inner ethical crisis.

The second part of the thesis has focused on analyzing the selected novels. It assumes that the common point of departure for Ian McEwan, Marcel Theroux, Margaret Atwood, and Sara Hall, is to portray anthropogenic climate change, meaning that they have focused on the idea that climate change is a human made phenomenon. These writers seek to warn readers with the multiple results of climate change and environmental degradation by converting scientific data into experiences and providing them with emotions felt under this environmental crisis to help them speculate the various scenarios climate change can lead to.

The first chapter of the second part has dealt with the representation of

climate change and environmental degradation in the literary works of two male writers. In *Solar*, climate change is portrayed as a problem that is neglected by the main character, Beard who is skeptic about climate change and whose only interest in environmental issues is to serve his own ambitions and material interests. Therefore, McEwan, as it has been shown in his novel, considers that the principles of solving climate change and environmental degradation should be ethical, and far from any kind of material self-interest. By discussing the solutions for this problem from a scientific point of view, McEwan in *Solar* reveals facts about human nature and the causes behind the failure of such solutions. In *Far North*, Marcel Theroux portrays a world that could not exist peacefully, and this has led to the collapse of the human civilization and to language at the same time. The author portrays a post-apocalyptic world where characters have returned to a primitive life style as a consequence of climate change and environmental degradation.

In the second chapter of the second part, the analysis of the novels written by Atwood and Hall show that female writers share the same concerns with male writers about climate change and environmental degradation, and try , in the same way as their male counterparts, to propose solutions to the issue of climate change. Atwood's *Oryx and Crake* depicts a threat of human extinction as a result of climate change and environmental degradation through foretelling Covid-19, where the writer imagines the spread of a virus called JUVE that is not very different from

Covid-19 that is experience by the whole planet these last years. In the same way as McEwan, Atwood discusses the role of science and scientists in her literary production, where she imagines that while scientists try to solve such environmental calamity; their solutions led to the massive destruction of humanity. Through her representation of climate change and environmental degradation, Atwood raises her readers' awareness about the consequences of bio attacks, caused by environmental degradations, on humanity in general. She reveals that telling stories is an effective strategy to raise people's awareness about a potential bio-disaster, in particular, and to solve the Anthropocene problems, in general. In *The Carhullan Army*, Sarah Hall uses real details to discuss the issue of climate change and environmental degradation to present them as new ecological realities in literature. She uses the flooding to be another completely different vision of what might climate change lead to.

The third chapter of the second part has analyzed the role of language in a climate change novel. Through the analysis of the four selected novels, *Solar*, *Far North*, *Oryx and Crake*, and *The Carhullan Army*, it has been shown that Ian McEwan, Marcel Theroux, Margaret Atwood, and Sarah Hall agree on the importance of the relationship between human beings, language and the environment. They have shown that the linguistic repertoire is crucial to the physical environment human beings are living in, and any environmental alterations result in linguistic alterations. Therefore, in the worlds of the four novels, degradations in environment have led to degradations in language. Although each writer has been

unique in his style, they have succeeded in represent this ultimate relationship between environment and language as crucial, insisting on the fact that the absence of one aspect would lead to the absence of the other. In *Solar,* degradations in environment and its climate have led to degradations in the language of a scientist as a consequence of his unethical responsibility. In the other three novels, the writers have shown that the death of the natural ecosystems lead to the death of the language, and consequently, the death of human beings. These writers have dealt with climate change as a problem that has been caused by human beings and which has brought with it changes in different domains. The different representations of climate change they make in their narratives have convinced their readers that climate change and environmental degradation are a reality human beings are living, and not just a fictional representation of nature. Their depiction of the creation of new words to communicate, on the other hand, carries hope to solve the issue of climate change and reduce the effects of environmental degradation.

The other common point among the different writers' works studied in this dissertation, is the settings of their stories. The highly technologized society has been the ultimate background for their narratives. They have shown, in their novels, how human behaviours guide the scientific progress not only to beneficial results, but also to disastrous ones that have harmed nature and led to its destruction and loss. Although each one of the four writers has framed his narrative in a different way;

each one of them has portrayed a different climate change scenario, all have insisted on the appearance of a geological change that has led to a disaster either on an individual level or on a societal level. Moreover, Marcel Theroux, Margaret Atwood, and Sarah Hall have focused on portraying this geologic change while Ian McEwan has portrayed the current situation of the environment, before any disaster takes place.

On the other hand, the characters in the four novels have been portrayed under different economic conditions that control their reactions, attitudes and choices about the climate change issue. Their differences in status, educational level, and degree of awareness make them stand for ordinary people that can witness environmental deterioration and their effects on any stage of their lives. In addition, in all four selected novels, the main characters suffer but no one of them dies. This is meant by the writers to show that climate change is a struggling issue that needs strong beliefs and hope to solve it. They have finished their novels with open ends to let their readers decide on the ending they want to the planet they are living on. It is a way to make them not only aware of the danger awaiting humans because of climate change and environmental degradation, but also to make them feel responsible for taking action and changing things. That is the reason way the four authors do not discuss the issue of climate change in isolation. They relate it to political, social, economic, and gender issues that cannot be separated from it. They also give space to their characters to experience climate change individually, but collectively, thinking

that climate change is a global issue and that all humans should be concerned with it.

Finally, it is evident from the study of the four novels, that their authors consider humans as the sole responsible for the degradation of the environment and the emergence of climate change issues. This has given birth also to a new form of narrative, the climate change novel. In this kind of works, writers experiment with new forms of plot and language to make their readers aware of the danger of climate change and raising their awareness to take effective action.

BIBLIOGRAPHY

PRIMARY SOURCES

Atwood, Margaret. *Oryx and Crake.* Nan A. Talese: New York and London. , 2003. *Pdf*.

Ian McEwan, Solar. New York: Penguin Random House, 2010. *Pdf*

Hall, Sarah. *The Carhullan Army*. 2007. London: Faber and Faber, 2010. *Pdf.*

Theroux, Marcel. *Far North.* London: Faber and Faber, 2009.

BOOKS

Andersen, Gregers. *Climate Fiction and Cultural Analysis: A New Perspective on Life in the Anthropocene*. New York: Routledge, 2020.

Barry, Peter. *Beginning Theory: An Introduction to Literary and Cultural Theory*. Manchester : Manchester University Press, 2009

Bracke, Astrid. *Ecocriticism and the Contemporary British Novel.* New York: Radboud University , 2018.

Bould, Mark et al. Eds . *The Routledge Companion to Science Fiction.* New York: Routledge, 2009.

Buell, Lawrence. *The Future of Environmental Criticism: Environmental Crisis and Literary Criticism.* Oxford: Blackwell Publishing. 2005

Clark, Timothy. *Ecocriticism on the Edge: The Anthropocene as a threshold concept.* London: Bloomsbury Publishing, 2015.

Dwyer, Jim. *Where the Wild Books Are: A Field Guide to Ecofiction.* Nevada: Nevada Press, 2010.

Glotfelty, Cheryll, et al. *The Ecocriticism Reader: Landmarks in Literary*

Ecology. London: The University of Georgia Press, 1996.
Hughes, J. Donald. *An Environmental History of the World Humankind's Changing Role in the Community of Life*. London: Routledge, 2009.

Ingold, Tim. *The Perception of the Environment: Essays on livelihood, dwelling and skill*. London: Routledge, 2002.

Suvin, Darko. *Metamorphoses of Science Fiction: On the Poetics and History of a Literary Genre*. London: Yale University Press, 1979.

Thornley,G.C, and Gwyneth Roberts. *An Outline of English Literature*. Essex: Longman, 2007.

Trexler, Adam. *Anthropocene Fictions: The Novel in a Time of Climate Change*. Charlottesville : University of Virginia Press, 2015. Pdf.

BOOK CHAPTERS

Grove. Richard. H. "*Colonial Conservation, Ecological Hegemony and Popular Resistance: Towards a Global Synthesis*" in *Imperialism and the Natural World*. Cambridge: Cambridge, 1987. Pp. 15-50

Grundmann, Heike. "*Shakespeare and European Romanticism*." *Companion to European Romanticism.* Ed. Michael Ferbera. Oxford: Blackwell Publishing, 2005. Pp. 29-48.

Howarth, William. "*Some Principles of Ecocriticism*" in *The Ecocriticism Reader: Landmarks in Literary Ecology*. Eds. Cheryll Glotfelty and Harold Fromm. Athens and London: University of Georgia Press, 1996.

ENCYCLOPEDIA

McClinton-Temple, Jennifer. *Encyclopedia of Themes in Literature*. New York: Facts On File, 2011.

ARTICLES

Alkhattabi, Nouf. *"The Roots of Ecofeminism in Terry Tempest Williams*

'Refuge'"" Journal of Arts & Humanities, Vol. 08, Issue 02, 2018. Pp. 1-6. Accessed Date 26/11/2019. <https:/www.semanticscholar.org>

Arnold, Jean. "*Forum on Literatures of the Environment" PMLA,* Vol. 114, No.5, Oct (1999). Pp. 1089-1104. Accessed Date 20/09/2019. <https://pdfs.semantischolar.org>pdf>

Ashton-Smith, Alan. "*The Invaded Home in Ian McEwan's Saturday and Solar*" *Peer English.* Pp. 132-40. Accessed Date 25/03/2020. <https ://www2. le. ac.uk>

Bagula, Neema Jimmy. *"Ecocritical Approach to Literary Text Interpretation"* Vol. 18 No. 2, Oct (2015). Pp. 369-78. Accessed Date 08/09/2019. <www.issr-journals.org>

Bakhtiari, Mahdi Hojjat, et al. *""By the Name of Nature But against Nature: An Ecological Study of Joseph Conrad's Heart of Darkness*" *Journal of Anthropology & Archaeology*, Vol. 1, no.1, June 2013: 01-12. Accessed Date 31/05/2018.
< http:// jaanet.info/journals /jaa/Vol_1_No_1_June_2013/1.pdf>

Banuri, Tariq, et al. "*Climate Change and Sustainable Development" DESA Working Paper*, no. 56, October 2007: 1-24. Accessed Date 06/03/2018
< https://core.ac.uk/download/pdf/7189012.pdf >

Beran, Zdenek. *"Metafictionality, Intertextuality, Discursivity: Ian McEwan's Post-Millennial Novels"" Philologica*, No. 1 (2016). Pp. 123-35.
Accessed Date 10/04/2020. <https://karolinum.cz>clanek>

Berndt, Katrin. "*Science as Comedy and the Myth of Progress in Ian McEwan's Solar"". Mosaic: An Interdisciplinary Critical Journal*, Vol. 50, No. 4, December (2017). Pp. 85-101.
Accessed Date 25/07/2020. <https://www.jstor.org>stable>

Boes, Tobias, and Kate Marshall. "Writing the Anthropocene" *The Minnesota Review*, 83 (2014). Pp. 60-72. Accessed Date 25/07/2020. <tobiasboes.net>2011/01>w.. .>
Bolchi, Elisa. *"An Air-conditioned Global Warming: The Description of Settings in Ian McEwan's Solar*" *I'analisi linguistica e letteraria,* xxiv,

2(2016). Pp. 35-42. Accessed Date 19/03/2020.
<www.analisilinguisticaeletteraria.eu>

Bracke, Astrid. "Flooded Futures: *The Representation of the Anthropocene in Twenty- First-Century British Flood Fictions*" *Critique: Studies in Contemporary Fiction,* Taylor & Francis groups (2019). Pp.1-11.

Bracke, Astrid. *"Introduction: Climate Crisis and the Cultural Imagination*" *Climate Crisis and the 21st-Century British Novel.* London: Bloomsbury Academic. *Bloomsbury Collections,* 17 March (2020). Pp. 1-22.
Accessed Date 15/03/2020. <https://www.bloomsburycollections.com>

Buell, Laurence. *"Forum on Literatures of the Environment*" *PMLA,* Vol. 114, No.5, Oct (1999). Pp. 1089-104. Accessed Date 20/09/2019. <https://pdfs.semantischolar.org>pdf>
Bushell, Simon, et al. *"Towards a Unifying Narrative for Climate Change "* *Briefing paper,* no. 18 April 2016, pp. 1-19. Accessed Date 01/07/2018.
<https://www.imperial.ac.uk/

Chameides, Bill. *"The Rise of Climate Fiction*" *Conservation,* no. 17, December 2013. Accessed Date 08/04/02018.
< http://www. conservationmagazine.org/2013/12/rise-climate-fiction/html>

Charles, John Ryan. "*Ecocriticism*" *The Year's Work in Critical and Cultural Theory*" , 2020. Pp.1-23. Accessed Date 04/01/2021.
< https://www.researchgate.net>,

Cojocaru, Monica. *"Debunking the Global Warming Metanarrative: An Ecocritical Reading of Ian McEwan 's Solar" Gidni,* Pp. 346-52.
Accessed Date 21/03/2020 <https://old.upm.ro>gidni>Lit>

Cooper, Swithun. *"British Literature Today: What to Read after Julian Barnes, Martin Amis and Ian McEwan*" *Research and Information Manager Literature, British Council.* December 2016 . Accessed Date 27/11/2021. <https://www.britishcouncil.ru>...>
Curtis, Claire. "*What Will They Do Tomorrow? Post-apocalyptic Fiction and the Social Contract"* FEB 3 2013. Pp 1-4. Accessed Date 04/10/2021.
<https://www.e-ir.info>

Dijstelbloem, Huub. "*Science in a Not So Well-Ordered Society. A Critique on Philip Kitcher's Account of Procedural Democracy*." Pp. 1-24. Accessed Date 15/03/2020. <https://scienceintransition.nl>>

Dittmar, Michael, et al. *"Man-Made Climate Change: Facts and Fiction*" *Physics.soc-ph*, March 2004: 1-8. Accessed Date 26/04/2018. < http://cds.cern.ch/record/725273/files/0403083.pdf>

Durbeck, Gabriele. *"Writing Catastrophes: Interdisciplinary Perspectives on the Semantics of Natural and Anthropogenic Disasters"" Ecozono.* 2012, Pp. 1-9. Accessed Date 13/12/2018. <https://core.ac.uk/download/pdf/58910632.pdf>

Ereaut, Gill, et al. *"Warm Words: How Are We Telling the Climate Change Story and Can We Tell It Better"" Institute for Public Policy Research,* August , 2006. Pp. 2-32. Accessed Date 30/11/2021. <https://www.ippr.org>2011/05>

Fenn, Vathana. *"Roots of Ecocriticism: An Exploration of the History of Ecocriticism, a Literary Theory of the Post-Modern World"" Journal of English Language and Literature (JOELL),* Vol.2, Issue 2, 2015. Pp. 114-9. Accessed Date 11/05/2018. <joell. in>uploads>

Flannery, Eoin. *"Ecocriticism"" The Year's Work in Critical and Cultural Theory,* 24, issue 1 02/ July , 2016. Pp. 419-38. Accessed Date 21/08/2019. <https://academic.oup.com> mbw020.pdf >

Goodbody, Axel. "*Framing in Literary Energy Narratives'"* University of Bath, 2018. Pp.1-23. Accessed Date 21/03/2018. <https://pdfs.semanticscholar.org/053b/8bd81417eb341ab80e12299754a666933b0b.pdf>

Glacken, Clarence J. "*Reflections on the History of Western Attitudes to Nature""*

GeoJournal: Kluwer Academic Publishers, Vol. 26, no. 2, Febraury 1992. Pp. 103-11. Accessed Date 31/05/2018.
<http://www.d.umn.edu/~pfarrell/Environemntal%20Conservation/western%20attitudes%20toward%20nature.pdf>

Ho, Peter. "*Greening without Conflict? Environmentalism, NGOs and Civil Society in China"" Environmentalism in China*. Pp. 893-921.
Accessed Date 01/07/2018.
<6f083066ef9e8c1079ef2e7dc3ebdf5adef6.pdf>

Howden-Chapman, Amy. "*Writing Derangement: Climate Change and the Novel.*"Pp. 59-66. Accessed Date 07/03/2020.
<thedistanceplan.org>Issue 5

Howe, Eric. "*Henry David Thoreau, Forest Succession & the Nature of Science: A Method for Curriculum Development*" *The American Biology Teacher,* Vol. 71, no. 7, September 2009. Pp. 397-404.
Accessed Date 30/05/2018.
<https://bioone.org/journals/The-American-Biology-Teacher/volume- 71/issue-7/005.071.0703/Henry-David-Thoreau-Forest-Succession-amp-The- Nature-of-Science/10.1662/005.071.0703.short >

Hsu, Shou -Nan. *"Truth, Care, and Action: An Ethics of Peaceful Coexistence in Ian McEwan's Solar"" PLL,* Pp. 326-49. Accessed Date 26/03/2020.
<www.english.nutn.edu.tw>

Hulme, Mike. *"Why We Disagree about Climate Change.""* Accessed Date 23/09/2020.
<https://www.mikehulme.o>

Hutchings, Kevin. *"Ecocriticism in British Romantic Studies."" Literature Compass,* Vol. 4, no 1, 16 January (2007). Pp. 172-202.
Accessed Date 21/ 08/ 2017.
<https://onlinelibrary.wiley.com>

Ishaq-ur Rahman, Muhammad. "*Climate Change: A Theoretical Review*." *Interdisciplinary Description of Complex Systems,* Vol. 11, No. 1, (2013): 113.
Accessed Date 06/03/2018 <indecs2013_pp1_13.pdf>

Javad, Seyed Habibi. "*Incredulity towards Global-Warming Crisis: Ecocriticism in Ian McEwan's Solar. " 3L: The Southeast Asian Journal of English Language Studies,* Vol. 21 No 1. Pp. 91 - 102.
Accessed Date 15/03/2020.<ejournal.ukm.my>

Johns-Putra, Adeline. "A *New Critical Climate*." Accessed Date 14/03/2018.
< https://www.academia.edu/4945374/A_New_Critical_Climate >

- - -. "*Climate Change in Literature and Literary Studies: From Cli- Fi,Climate Change Theater and Ecopoetry to Ecocriticism and Climate Change Criticism*." Ed. Mike Hulme, et al. *WIREs Climate Change,* (2016): 385-401. Accessed Date 06/03/2018.
<https ://www.researchgate.net/publication/291388137_Climate_change_in_literature_and_literary_studies_From_clifi_climate_change_theater_and_ecopoetry_to_ecocriticism_and_climate_change_criticism>

Kerridge, Richard. "*Ecocriticism*." *The Year's Work in Critical and Cultural Theory.* Vol. 21, Issue 1. Pp. 345-374. Accessed Date 16/09/2019.
<https://academic.oup.com>

Kirchhofer, Anton et al. "*Triangulating the Two Cultures Entanglement: The Sciences and the Humanities in the Public Sphere*." *Journal of Literature and Science,* Vol 10, No. 2 (2017) Pp. 26-37. Accessed Date15/03/2020.
<www.literatureandscience.org>

Kutting, Gabriela. "*Globalization and the Environment: Moving beyond Neoliberal Institution*." *International Journal of Peace Studies* Vol 9 No 1 Spring/Summer 2004.

Lehtimaki, Markku. "A *Comedy of Survival: Narrative Progression and the Rhetoric of Climate Change in Ian McEwan's Solar." Environment and Narrative: New Directions in Narratology.* Edit. Erin James and Eric Morel. Columbus: Ohio State University, 2020. Pdf.

Leyda, Julia, et al. "*The Dystopian Impulse of Contemporary Cli-Fi: Lessons and Questions from a Joint Workshop of the IASS and the JFKI (FU Berlin).'" IASS Working Paper,* November 2016: 2-27. *Accessed Date 04/06/2017.*
<https://www.iasspotsdam.de/sites/default/files/files/wp_nov_2016_the_dystopian_impulse_of_contemporary_cli-fi.pdf >

Ling, Chen. "*Ecological Criticism Based on Social Gender: The Basic Principles of Ecofeminism*." *Higher Education of Social Science* Vol. 7, No. l, 2014. Pp. 67-72. Accessed Date 24/11/2019.
<https :/www. semanticscholar.org>

Lokke, Kari. "The Romantic Fairy Tale." *Companion to European Romanticism*. Ed. Ferbera, Michael. Oxford: Blackwell Publishing, 2005. 138-56.

Love, A. Glen. "Science, Anti-Science, and Ecocrititism." *ISLE*, 10 October (2010). Pp. 65-81. Accessed Date 20/09/2019.
<rvanoy.asp.radford.edu>run.pdf>

Marangoz, Selin Qiplak. *"The Idea of 'Delight and Instruct' in Aristotle's Poetics, Horace's Ars Poetica and William Wordsworth's Preface to Lyrical Ballads.""* *ZKUSosyal Bilimler Dergis*, Vol. 2, no. 4, (2006): 211-9.
Accessed Date 08/05/2018.
< file:///C :/Users/pc2/Downloads/136-385-1 -PB .pdf >

Henry Martin D. *"The Enlightenment and Romanticism from a Theological Perspective" ITQ*, Vol. 63, no. 3, 1998. Pp. 250-62.
Accessed Date 01/07/2018.
<http ://mural.maynoothuniversity.ie/626/1/2_Enlightenment_and_Romanticis m. pdf>

McEwan, Ian. *"Prologue: Save the Boot Room.""* 2007. Pp. xviii-xxii.
Accessed Date 23/02/2020 <www.nobel-cause.de>book>

McKechnie, Claire, et al. *"Introduction: Literature, Science, and the Natural World in the Long Nineteenth Century."" Journal of Literature and Science*, Vol. 5, No. 2, 2012.Pp1-4.
Accessed Date 17/09/2019.
<http://www.literatureandscience.org/issues/JLS_5_2/JLS_vol_5_no_2_McKe chnieAlder.pdf>

McKibben, Bill. "*What the Warming World Needs Now Is Art, Sweet Art*." Accessed Date 07/04/2019.
<http://grist.org/article/mckibben-imagine>

McKusick, James. "*Nature*" *Companion to European Romanticism*. Ed. Ferbera, Michael. Oxford: Blackwell Publishing, 2005.

Mcneill, J.R. "*The Nature of Environmental History: Observations on the Nature and Culture of Environmental History*" *History and Theory*, Theme Issue 42, Vol. 5, No. 43, December 2003.Pp. 5-43.
Accessed Date 17/09/2018.
< https://www.williamcronon.net/writing/H701_McNeill.pdf>

Mohammadi, Davood Moghadam, et al. "A *Brief Discussion on Human/Nature Relationship I" International Journal of Humanities and Social Science,* Vol. 5, No. 6, June 2015. Pp. 90-3. Accessed Date 01/07/2018.
< http://www.ijhssnet.com/journals/Vol_5_No_6_June_2015/11.pdf>

"Nature Writing." Accessed Date 21/08/2018.
<https://www.uwosh.edu/facstaff/barnhill/ES243/pp%20outline%20Nature%20Writing%20-%20Ecocriticism.pdf >

Nerlich, Brigitte et al. *"Theory and Language of Climate Change Communication*." *WIREs Clim Change* No. 1 ,2010. Pp. 97-110.
Accessed Date 30/04/2019.
<https://pdfs.semanticscholar.org/7e47/0dd812686c34e5a50c65a6fc63b2fd63db2f.pd>

Nikoleris, Alexandra et al. *"Narrating Climate Futures: Shared SocioeconomicPathways and Literary Fiction*." *Springer*, No.143, 8 July 2017. Pp. 307-19. Accessed Date 05/05/2020.
<https ://link. springer.com>

Nitzke, Solveig Dresden. *"The Adaptation of Disaster: Representations of Environmental Crises in Climate Change Fiction*." Pp. 38-58.
Accessed Date 17/03/2020.
<ttps://www.academia.edu>

Nuttall, Torben, et al. "*The Arctic in literature and the Popular Imagination*." *The Routledge Handbook of the Polar Regions,* 18 July (2018). Pp 45-56.

Ozge, Cansu Ozmen. "*Global Disasters and Personal Responses in Ian McEwan's SOLAR." Humanitas,* Vol 6, No 12 ,2018. Pp. 1-9.
Accessed Date 21/02/2020.
<https://dergipark.org.tr>artic>

Pereira da Silva, Ricardo. "*Terra Incognita: Literary Maps and Nature Representations in Jon Krakauer's into the Wild" Gaudium Sciendi,* no. 5, December 2013.Pp. 64-77. Accessed Date 08/05/2018.
<http://www2.ucp.pt/resources/Documentos/SCUCP/GaudiumSciendi/Revista _Gaudium _Sciendi_N5/09Ricardo.pdf >

Reddy, Senjay M. "*The Eco-Criticism: A New Perspective of Literary Study." Quartely Research Journal,* Vol. I, Issue. 2, October to December 2015.Pp. 31-56. Accessed Date 11/05/2018.
<http://scholarsimpact.com/english/wp-content/uploads/2016/01/005.pdf>

Robinson, Iain. "*You Just Know When the World Is about to Break Apart': Utopia, Dystopia and New Global Uncertainties in Sarah Hall's The Carhullan Army."* In *Twenty-First Century Fiction: What Happens Now*. Edit. Sian Adiseshiah et al. New York : Palgrave Macmillan.

Ryan, John. "*Rethinking the Seasons: New Approaches to Nature The Six Seasons: Shifting Australian Nature Writing Towards Ecological Time and Embodied Temporality." Transformation Journal of Media & Culture*, no. 21, 2012.Pp. 1-13. Accessed Date 30/05/2018.
<http://www.transformationsjournal.org/wpcontent/uploads/2016/12/Ryan_Trans21.pdf>

Scheese, Don, "*Some Principle of Ecocriticism. " "Defining Ecocritical Theory and Practice: Sixteen Position Papers from the 1994 Western Literature AssociatioMeeting." ASLE,* 6 October 1994. Pp. 1-18.
Accessed Date 18/09/2018.<www.asle.org>uploads>AS.pdf>
Slovic, Scott. "*The Third Wave of Ecocriticism: North American Reflections on the Current Phase of the Discipline*." *Ecozone,* Vol. 1, No.1, 2010. Pp. 410.
Accessed Date 16/09/2019.
<ecozona.eu>doanloadpdf>

Soloshenko, Alena. "*Language, Cognition and Culture in Eco-Narratives*."
European Science Review, Vol. 5, No. 6, 2015. Pp. 148-50.
Accessed Date 07/05/2020.
<https://halshs.archives-ouvertes.fr>

Stanwick, Peter A."The *Evolution of Capitalism: A Comparison of British and American Literature*." Accessed Date 08/05/2018 .<

https://files.eric.ed.gov/fulltext/EJ1126342.pdf>

Sykes, Rachel, et al. "*Contemporary Studies Network Roundtable: Responding to Robert Macfarlane's 'Generation Anthropocene '*." *Open Library of Humanities,* 22 February. 2017: 2-47.
Accessed Date 21/08/2017. < https:// olh.openlibhums.org /articles /10.16995 /olh.153/>

Tate, Andrew. "The *Storm-Cloud of the Twenty-First Century: Biblical Apocalypse, Climate Change and Ian McEwan 's Solar" The Glass,* Pp. 3-12.
Accessed Date 22/03/2020 <https://eprints.lancs.ac.uk>

Taylor, David. "*Defining Ecocritical Theory and Practice: Sixteen Position Papers from the 1994 Western Literature Association Meeting*." *ASLE,* 6 October (1994). Pp. 1- 18. Accessed Date 18/09/2018.
<www.asle. org>uploads>AS.pdf>

"The 'New Environmentalism ' of the 1960s." Accessed Date 01/07/2018
<https://www.uwosh.edu/facstaff/barnhill/ES243/pp%20outline%20New%20 Environmentalism.pdf >

Tosic, Jelica. *"Ecocriticism - Interdisciplinary Study of Literature and Environment*." in *Working and Living Environmental Protection,* Vol. 3, No. 1, 2006. Pp. 43-50.
Accessed Date 16/ 09/ 2019 <factajunis.ni.ac.rs>walep2006pdf>
Trexler, Adam, et al, '*Climate Change in Literature and Literary Criticism*.' Pp. 1-36. Accessed Date 01/07/2018.
<https://www.researchgate.net/publication/230451233_Climate_change_in_lit erature_and_literary_criticism >

Tuur, Kadri. *""Of Place andEcocriticism*." Pp.177-81.
Accessed Date 16/09/2019. <www.eki.ee>place>pdf>

Walezak, Emilie. "*Landscape and Identity: Utopian/Dystopian Cumbria in Sarah Hall's The Carhullan Army. " Critique: Studies in Contemporary Fiction.* (2018). Pp.1-8.

Warner, Koko. "*Climate Change and Global Warming: The Role of the International Community: Background Paper for WDR 2014 on Managing Risk for Development*." *World Development Report,* June 2013.Pp 1-30.

Accessed Date 06/03/2018. <https://pdfs.semanticscholar.org /e5f0/9802ed281a1cba18dfff5cfc0a7986f50b48.pdf>

What Is Terraforming? Accessed Date 17/05/2019. <https://sites.google.com>

World Health Organization, 2003. *Climate Change and Human Health: Risks and Responses,* Edi.A.J. McMichael, et al. WHO, Geneva, Accessed Date 15/02/2021. <https://www.who.int>

Yusoff, Kathryn, et al. "*Climate change and the Imagination*." *WIREs Climate Change,* (2011): 117-35. Accessed Date 08/11/2017. < https://marymattingly.com/images/press/WIREs_ClimateChange.pdf >

Zemanek, Evi. "A *Dirty Hero's Fight for Clean Energy: Satire, Allegory, and Risk Narrative in Ian McEwan's Solar" Ecozon,* Vol 3, No 1 (2012). Pp.5160.

SEMINARS

Kovesi, Simon. *Ecology & Romanticism Special Subject, Semester* 1, *Seminar, November* 2010: 1-21. Accessed Date 02/06/2018. <https://fr.scribd.com/document/ 255798869/Ecology-and-Romanticism- Handbook-2010-11 >

THESIS

Burnett, Lucy. *Through the Weather Glass: & What Icarus Found There.* Unpublished Thesis. Salford University, 2013.

Costello, Paige. *Prose and Polarization: Environmental Literature and the Challenges to Constructive Discourse.* Unpublished Thesis. Claremont McKenna College, 2012.

David, Sophia. *Eco-Fiction: Bringing Climate Change into the Imagination.* Unpublished Thesis. Exeter University, June 2016.

Denise, Kathryn Riley. *Narratives Exploring Earth-based Spirituality for Transformative Outdoor and Environmental Studies.* Unpublished Thesis. Deakin University, 2014.

Jones, Geoffrey and Christina Lubinski. *Historical Origins of Environment Sustainability in the German Chemical Industry, 1950s-1980s.* Unpublished Thesis. Harvard Business School, 2013.

Kjeldaas, Sigfrid. *Nature Writing as Contact Zone: Western and Inuit Perspectives on Landscape and Animals in Barry Lopez's Arctic Dreams.* Unpublished Thesis. The Arctic University of Norway, 2017.

Mcleod, Sylvia. *Aspects of Voice in Ian McEwan's Fiction*. Unpublished Thesis, Western Australia University. 2018.

Mette, Anne Hartvigsen. *Sustainability or Climate Change? An Ecocritical Analysis of Ian McEwan's Solar.* Unpublished Thesis, Varterminen University. 2013.

Shams, Tawahid Chowdhury. *Thomas Hardy & Romantic Tradition.* Unpublished Thesis. Brac University, 2008.

Siperstein, Stephen. *Climate Change in Literature and Culture: Conversion, Speculation, Education.* Unpublished Thesis. Oregon University, June 2016.

Soo, Ng Nee. *(Re)Configurations of Power and Identities in Twenty-First Century Fiction.* Unpublished Thesis. London University, 2010.
Tuur, Kadri. *Semiotics of Nature Representations:On the Example of Nature Writing.* Unpublished Thesis. Tartu University, 2017.

Tupa, Bc. Lucia. *Analysing Style in Translation: Czech and Slovak Translations of Ian McEwan.* Unpublished Thesis, 2018. Masaryk University.

William, David Fevyer. *Reading the Anthropocene through Science and Apocalypse in the Selected Contemporary Fiction of J G Ballard, Kurt Vonnegut, Cormac McCarthy and Ian McEwan.* Unpublished Thesis. Southampton University, 2016.

Werner, Bigell. *Distinction but not Separation: Edward Abbey's Conceptualization of Nature.* Unpublished Thesis. Troms0 University, 2006.

INTERVIEWS

Fiedorczuk, Julia. "*The Problems of Environmental Criticism: An Interview with Lawrence Buell"* Accessed Date 16/09/2019. <https://depot.ceon.pl>01_pjas5>

REVIEWS

Else, Liz. *"Smart Companions,"* | NewScientist | 4 July 2009

Tuhus-Dubrow, Rebecca. "Cli-Fi: Birth of a Genre." Dissent, Vol.60, No. 3, Summer 2013. Pp. 58-61 (Review).

ملخص

هذه ألاطروحة عبارة عن فحص للتمثيل الخيالي لتغير المناخ والتدهور البيئي في اربع روايات معاصرة . على وجه التحديد , فانها تحلل الخطابات الادبية التي من خلالها يستجيب عدد من الكتاب البريطانيين المعاصرين للازمة البيئية الحالية, تغير المناخ, و كيف تساعد هذه الاستجابات الثقافية في انشاء شكل ادبي جديد و هو خيال تغير المناخ. من خلال تحليل نقدي ايكولوجي عميق لرواية ايان ماكوان "الطاقة الشمسية",مارسيل ثيرو "اقصى الشمال", مارجريت اتوود "اوركس و كريك", وساره هول "جيش كارهولان", تسعى ألاطروحة الى تحديد ردود افعال و رؤى هؤلاء الكتاب تجاه هذه القضية, وتميز الاساليب الادبية التي استخدموها لتخيل هذه الظاهرة الطبيعية و سرد نتائجها المباشرة و الغير مباشرة. بعبارة اخرى , فانها تهدف الى التطرق الى الاقتراحات المختلفة التي قدمها هؤلاء الكتاب لاعلام قرائهم بمشكلة تغير المناخ و تحفيزهم على اعادة التفكير و فهم الحقائق الجديدة المتعلقة ببيئتهم . للوصول الى حياة مستقبلية مناسبة , يعتبر هؤلاء الكتاب من بين كثيرين ممن يدعون لرفع مستوى الوعي البيئي من خلال الادب , معتقدين ان الخيال الادبي له تاثير كبير في تغيير ثقافة الاشخاص نحو الطبيعة. يثبت التحليل الذي تم اجراؤه في هذه الدراسة ان هؤلاء الكتاب يتفقون على ان تغير المناخ له منشا بشري, لكنهم يختلفون في طريقة تقديمه. يقدمون للقراء روايات مختلفة تصور تغير المناخ و التدهور البيئي, او الانثروبوسين, كانهيار عالم فاسد في " الطاقة الشمسية" , انهيار مجتمع فاسد في "اقصى الشمال", توقع كوفيد19 في"اوركس و كريك", و حدوث فياضانات في"جيش كارهولان". من خلال هذه الدراسة, يوضح هؤلاء الكتاب ان تغير المناخ و التدهور البيئي يؤثران على اللغة من الخطاب الضعيف نحو ضياعها و اعادة بنائها.

كلمات مفتاحية: تغير المناخ, تدهور بيئي, الرواية البريطانية المعاصرة, نقد ايكولوجي بيئي, نقد نسوي بيئي, ايان ماكوان "الطاقة الشمسية", مارسيل ثيرو "اقصى الشمال", مارجريت اتوود "اوركس و كريك", وساره هول "جيش كارهولان".