Chapter I

Introduction: Anthropocene Thinking and Surviving Extinction

1.1 Extinction: A Background

Research shows that the Earth's biodiversity is shrinking significantly, and consequently, a possible mass extinction threatens our planet currently. A considerable number of species are losing their habitat and are said to move toward extinction. The word "extinction" instantly puts forth images of imminent catastrophe and the annihilation of species on a large scale. However, the extinction of species is not a phenomenon of recent times; instead, it was first discovered in the eighteenth century "to account for the discovery of fossils that had no living correlates" (Grusin viii). Extinction is now viewed as a natural cycle of creation and annihilation, thanks to the discovery of fossils of extinct creatures and Darwin's theory of natural selection. The processes of speciation and extinction are correlated, as scientists claim that about 99 percent of species that evolved over billions of years are already extinct, making way for the evolution of many more. Biologists say that extinction occurs rarely, more rarely than speciation, and it takes place at a "background extinction rate" (Kolbert 15). The calculation of the "background extinction rate" roughly states that one species disappears "every seven hundred years" (Kolbert 15). Mass extinction occurs when the rate of extinction is greater than the rate of speciation, causing a crash and a drastic decline in species and leading to a massive loss of biodiversity. Scientists concede to the fact that the planet is in the midst of the sixth mass extinction after experiencing five mass extinctions that have marked the end of geological epochs. The latest event of mass extinction happened 65 million years ago, marking the end of the Cretaceous–

Jurassic age and claiming the lives of all the dinosaurs. It is assumed that a huge meteorite explosion wiped out the entire Jurassic population, changing the climatic features on Earth.

The previous mass extinctions occurred on a pre-human Earth, and the fifth mass extinction caused the extinction of dinosaurs about 65 million years ago. The dramatic decline of dinosaurs, once occupying the top order of the food chain, eventually made way for the evolution of *Homo sapiens.* Though "extinctions are commonplace, running 1000 times the typical rate seen before humans walked the Earth" (Lewis and Maslin 4), this time, the sixth and current mass extinction, unlike the previous five, is human-induced. This insists that human beings as species have evolved as the chief geological force, causing significant ecological changes. Humans are not only impacting the present but also, for "the first time in Earth's 4.5 billion year history, a single species is increasingly dictating its future" (Lewis and Maslin 3). Human impact extending into the future prompts protracted human influence on the earth system, suggesting the indelible marks of human activities to be traced in the deposited rocks of the future. The impending mass extinction caused by and involving humans raises concerns about the future of humanity. The mass extinction suggests a future of eco-collapse that will drastically alter the planet's geophysical structure and climate, leaving humans to wonder about the future of the Earth that sustains humans and other forms of life. Since the previous extinction events had no human participation, the sixth mass extinction, with its disparate futuristic implications, raises questions and concerns about extinction. The presence of human beings in the current epoch complicates the situation, calling for several conjectures and speculations related to the future, expanding the temporal scale to the mark called "after humans."

1.2 Anthropocene: the new geological epoch

The effect of human beings is observed more than ever, so much so that the current epoch—yet to be officially accepted as one—is designated to the human species. According to the proposal, the current epoch that exhibits discernible marks of anthropogenic activities on the Earth system may be called the "Anthropocene." The term has entered academic discourse and scientific observations since Atmospheric Chemist Paul Crutzen and Biologist Eugene Stoermer in 2000 suggested that the Earth has superseded the Holocene, a relatively stable interglacial geological epoch, making way for the new epoch, the Anthropocene (17). The Anthropocene is called the "geology of mankind" (Crutzen 23), and considering many factors concerning the "growing impacts of human activities on earth and atmosphere" at global scales, it seems appropriate to "emphasize the central role of mankind in geology and ecology" (Crutzen and Stoermer 17). For the first time in history, a geological epoch has been named after a species, marking a turning point in the Earth's history as well as human history.

The Anthropocene, the human-centered geological epoch, inevitably binds human history to the history of the Earth, which until then has been dealt with separately. Also, it suggests the beginning of an era where human beings evolve as the central geophysical force, likely to continue their impacts in the unforeseeable future. However, geologists are yet to reach a consensus on the probable beginning of the epoch. The initial proposal regarding the timeline of the commencement of the epoch equates with the beginning of the European Industrial Revolution in the mid-eighteenth century, resulting in a considerable increase in carbon emissions to the atmosphere (Crutzen 23). Later, the geologists forming the Anthropocene Working Group (AWG)[1] propose that "the beginning of the nuclear age, which led to the

dispersal of artificial radionuclides worldwide, may be adopted as an effective stratigraphic boundary in Earth history. These radioisotopes appear in ice at both poles and in all countries" (Zalasiewicz et al., "When" 5). They propose that "the Anthropocene (formal and informal) be defined to begin historically on July 16, 1945, with the detonation of the Trinity A-bomb at Alamogordo, New Mexico" (Zalasiewicz et al., "When" 5). Thus, the demonstration of nuclear weapons has been assumed as a starting point for the Anthropocene following the end of the Holocene. In both the cases, the stratigraphy of the Earth is interlaced with major human activities that have changed the eco-political history of humans forever. The Industrial Revolution and the deployment of nuclear weapons both indicate the immense power human beings wield in modern times, having a compelling and long-lasting impact on the Earth system.

1.3 Anthropocene: the "geostory" of humankind and the "convergence of histories"

The term "Anthropocene" refers to both the stratigraphy of the Earth and the intertwined human existence with the Earth. And such an implication interrogates the position of human beings in the current epoch. The definition associated with the Anthropocene inextricably links the fate of humans with that of the Earth, thereby in a way, emphasising the centrality of *Homo sapiens*, which has evolved as a dominant species. The Anthropocene contains "Anthropos," which makes humans central to the Anthropocene discourses. Here, the Anthropocene cannot be restricted to its meaning as a geological epoch, and owing to its interconnection with human history it undisputedly enters the paradigm of socio-politics and cultural climate. The Anthropocene thus, seeks to connect the natural and social sciences, breaking down the age-old divide between the two. Because the Anthropocene has remained at the centre of academic debate across disciplines since its coinage in 2000, this nomenclature encompasses a variety of

discourses, including scientific, historical, socio-cultural, and political discourses. The Anthropocene, often interchangeably used with climate change and ecological depletion, indicates climate in a wider sense, including socio-cultural climate, human impact on meteorological climate, and human-caused biodiversity loss, invoking the fear of extinction. Reiterating the politics of anthropos, it is important to understand what "Anthropos" is in the Anthropocene, which provokes further discussions and speculations. Bruno Latour in "Anthropology at the Time of the Anthropocene" observes,

> The "anthropos" that is pushed center stage by geologists is not the same passive entity that used to populate the older narrative full of "natural" causal agents. It is a being that is inevitably endowed with a moral and political history. To the great surprise of those who had tried to paint the human agent as a bag of proteins, computerized neurons, and selfish calculations, it is as a *moral* character that human agency is entering the geostory of the Anthropocene. (n.p.)

Thus, the Anthropocene places human agency at the centre of "geostory" without excluding the historical significance of the species. One lingering question when discussing the "Anthropos" in the Anthropocene is what unites all humans from various socio-economic backgrounds, geopolitical locations, ethnographic origins, and historical circumstances. So, are all humans homogenised within a single "geostory"? If Paul Crutzen and his allies' proposal about the beginning of the Anthropocene is to be believed, the question likely leads to an answer that they homogenised human beings under the criteria of carbon emitting subjects and as power wielding ambitious beings. The human centric geostory is infused with narratives related to human evolution and the possible ways humans have emerged as the dominant species, which

compelled the scientists to name the current epoch after them. The consciousness of human agency as the pervasive force responsible for "pushing the Earth into planetary *terra incognita*" is coupled with "raising concerns about the future of Earth's environment and its ability to provide the services required to maintain viable human civilizations" (Steffen et al. 614). The geostory of present human dominance predates human existence and is constantly concerned with the future of the Earth, a *terra incognita*, an assumedly unsustainable space for humans, thereby eroding human agency.

The geologists' observations from the investigation of fossils prior to humans' existence on the planet trigger interest in the past. Human beings are interested in history, tracing the times of antiquity and colouring their imaginations about the times preceding those recorded by humans. Also, the human proclivity toward archiving antique objects and other remnants from the past exhibits their intentions of solidifying liquid time through unique items from the past. In a way, those antique objects signify a presence in the absence and an absence in the presence, for the archived objects from the past is a constant reminder of their absence in the present. Humans are inherently drawn to the thought of the absence of humans, especially when there is no trace of them. Similarly, the allure of absence arouses interest in a future Earth—a *terra incognita*—an unknown and currently absent space. The possibility of human extinction, as well as the transformation of the Earth into a planet incapable of supporting human life (or any form of life), points to the long-term possibilities that are yet to be realised. Therefore, the past refers to events that have once been present, and the future refers to events that are not yet present. Either way, the absence takes centre stage and intrigues thinking about the position of the Earth before and after humans. This is related to the deep history—the history pointing towards rocks and fossils indicating the existence of time precluding recorded human time. The

past and the future thus, address the absence-in-presence, fascinating humans equally, intriguing archaeological investigations, and inspiring imaginations for the future. Such a fascination with times unknown and unseen occupies the human conscience and pervasively influences the present. As a result, this thinking about the past and future, which shapes human endeavors, insists on a presence-in-absence situation. The presence-in-absence situation leads to the recognition of deep history that attempts to pay serious attention to the times before the evolution of human civilization (Smail 1). The study of the deep past of the Earth, or of deep time, "tears down the veil of pre-history" (Smail 2), and calls for the "convergence of histories" — "the history of the Earth system; the history of life, including the human evolution on the planet; and the more recent history of the industrial civilisation (for many, capitalism)" (Chakrabarty, "The Anthropocene" 45). The recognition of "deep time" prior to the appearance of humans on the Earth encourages the human imagination of an inhuman, non-human, or human-free future. Various possibilities and speculations about a futuristic terrestrial space and climatic conditions that hint at "the end of the world" follow from deep future thoughts (Leslie). The constant discussions surrounding the conjectures about "the end of the world" radicalise perceptions pertaining to extinction, indicating the annihilation of species. Such a suggestion conjures images of a forsaken and barren Earth, devoid of human beings and any other living being. Since the speculation about a devastating future extends to multiple temporal scales, it may lead us to think about ways in which present geopolitical scenarios manifest in the multi-scalar future.

1.4 "Anthropocene thinking," Extended Timescales and Extinction Consciousness

The imagination of futuristic scenes of eco-collapse is related to the Anthropocene and its underlying implications. The Anthropocene is not only limited to its meaning as a geological epoch, but it also bears implications related to anthropogenic activities causing planetary climate change. Given the speculations about the extinction of human species, questions about the likely extent of the Anthropocene may arise – Will the Anthropocene end with humans' extinction? Can the apocalypse caused by anthropogenic practices wipe out human marks on longer time scales? What constitutes the Anthropocene – the present dominating human agency alone, or the protracted human marks on the planet even after their non-existence? Many such questions plague the Anthropocene thinking, thus transcending its stratigraphic role to occupy the conscience of the current times and the times to come. Anthropocene thinking integrates the plasticity of human behaviour and actions, signifying the extension of the Anthropocene far beyond the finitude of time. Therefore, the Anthropocene does not solely signify a definite timescale, but speculatively, it assumes its all-pervasive presence in multi-scalar temporality beyond human capacity for recording time. As Jennifer Wenzel opines:

> The Anthropocene demands new ways of thinking about time that make strange our understanding of pasts, presents, and futures. These temporal shifts destabilize the straightforward, secular assumption that pasts and presents have futures, that things just keep on going, that time and history keep unfolding, whether according to the certitudes of a progress narrative or the more flat expectation of one damn thing after another, both of which are accounted for within what Walter Benjamin (1999) called 'homogeneous,

> empty time,' in which moments follow after each other like beads knotted on a string. (5)

The new ways of thinking about the Anthropocene deem it necessary to defy the conventional thoughts on recording time related to human experiences in the past and present. Since "climate change is the most pronounced Anthropocenic characteristic," (Crownshaw 888) there is a necessity to assess the cumulative effect of anthropogenic climate change, which is possible to do only when viewed beyond human experiences (Mertens and Craps 136). Therefore, the Anthropocene disrupts the linear temporal movement to recalibrate temporal scaling and promotes "trans-scalar thinking" (Goodbody 39). It tries to trace "the incomparably greater spatial and temporal scale of environmental change" (Goodbody 39) in order to understand the effects of anthropogenic climate change spread across multi-scalar temporality in order to predict extinction in the far future. The prospect of extinction as the end of the world conjures up images of various possibilities. Anthropocene thinking, largely dwelling on speculations, then seems like "a story that stretches from the deepest lithic recesses of the Earth to its unsheltered atmospheric expanses" (Opperman 2). Gabriele Dürbeck and Philip Hüpkes assert that "the Anthropocene concept implies a scalar incommensurability for human imagination and perception," (3) problematising the scaling of time. However, the incomprehensibility of timescale intrigues humans, inspiring further speculations about the existence of species (particularly humans) in a deep futuristic timescale. Such insistence — "the likelihood that humans will survive is slim," (Guterl 46) — complicates the problem of time scaling further, raising concern about who will record/scale time if the species responsible for it goes extinct.

The scale of anthropogenic climate change and the resultant extinction is unfathomable, while there is a constant reference to the future of the Earth. Such procrastination about the future of the planet leads to numerous questions related to the spatial and physical changes the planet will supposedly endure over multiple time scales — What trace will humans leave on the planet after they are extinct? Will they leave a plastic-covered planet? Will there be fossils to be discovered? What will the planet look like without humans? What will be the future of other species amid the human-driven environmental crisis and probable extinction? Such queries incite human intellectual faculty to think beyond the norm to surmise a situation of probable chaos. The questions already raised may lead to further queries – Who are thinking about the future? Why are we thinking about a future that is incomprehensible? How far is the future? Whose future are we thinking of— the future of our species or the future of other species? Whose extinction? Human extinction, or species extinction by humans? These intriguing questions are the ones that the thesis seeks to ponder upon, as they allow me to scaffold further arguments in the thesis. I am particularly interested in introspecting the role of humans in extinction, not just as a driving force but also as a thinking force behind it. Also, I probe the human propensity to procrastinate the future — something that is unreliable and unpredictable. The future that human beings behold is chaotic and apocalyptic, often mediated through narratives on screens and pages. Most of those narratives present us with terrifying scenarios designed to arouse our fear and anxiety towards ecological disasters and unpredictable climate change. These narratives largely focus on human anxiety, fear of loss, and human death, in order to convey the message that human beings are pushing themselves to their verge of extinction. The issues of nonhumans in those narratives are marginalised, only occasionally

appearing, and their survival remains at the mercy of kind animal lovers and environmental activists. As Ursula Heise argues,

> However much individual environmentalists may be motivated by a selfless devotion to the well-being of nonhuman species, however much individual conservation scientists may be driven by the eagerness to expand our knowledge and understanding of the species with whom we co-inhabit the planet, their extent that they become part of the stories of human communities tell about themselves: stories about their origins, their development, their identity, and their future horizons. (5)

So, does the thought of extinction threaten human agency in human imagination and speculative narratives, or does it manipulate means to reclaim human agency? Such questions require serious interventions, keeping in mind that the present extinction is unique for its inextricable link with humans. Social scientists and environmental thinkers insist on the need to view the planet through the lenses of multiplicity. The word "planetary" is no longer construed as humane; instead, it is understood to include diverse species within the web of life, an interwoven network of beings co-existing interdependently. Also, the relationship of extinction with human and nonhuman species stresses the "entangled significance" (Rose et al. 3) of extinction, highlighting species interconnectivity and the Earth's "incredible biological and cultural diversity" (Rose et al. 3). Despite the recognition of the earthly multitudes, the narratives of the future focus on a human-centric environment with images of destruction of human civilisation. Such representations of fallout and the unprecedented dispersion of human communities emphasise the "disaster of the Anthropocene," (N. Clark 19) shocking humans and forcing them to realise the vulnerability of human beings. Extinction is viewed as that disaster—an event that

"overwhelms our taken-for-granted senses and sensibilities, it also challenges us to try and begin sensing, thinking, and acting in new ways. It ends the world, and begins it turning anew" (N. Clark 22). As a disaster shocks and galvanises humans into actions, extinction, assuming the vision of a futuristic disaster, conspires contrary motifs of end and beginning, thereby provoking human endeavours for survival. This notion contradicts the "depressing inevitability and crushing finality of extinction" (Rose et al. 2). The crux of the thesis is to contrast the depressing notion of extinction with that notion of extinction embedded in survival strategy. I will elaborate on this later as I proceed further in the thesis to inquire about the conventional thoughts of extinction that are overwhelmingly distressing and nihilistic. Instead, I would like to propose an alternative point of view for perceiving extinction through the prism of survival, which may be more effective in dispelling humans' anxiety and trauma related to the overtly extensive future.

1.5 Literature Review

The notion of extinction associated with the dramatic fall of humanity intrigues thinking and theories on the subject. Philosophers and thinkers have expanded the concept of extinction, introducing new dimensions of thinking about it. The unavoidable human engagement with extinction broadens the scope of Extinction Studies by appropriating extinction's socio-cultural significance. As Claire Colebrook writes in *Death of the PostHuman* (2014), extinction is seen in three senses: "the now widely discussed sixth great extinction event; extinction by humans of other species; and self-extinction, or the capacity for us to destroy what makes us human" (10). Colebrook relates her understanding of extinction with a "nuanced notion" of climate change, as she views climate as an all-encompassing socio-political milieu, holding humans

and other organisms to the finite complexity of the system. Her research calls into question the viability of imagining a future based on current understandings of stratigraphy and climate change, and she proposes "opening up a post-anthropocentric point of view" (24) necessary to see human futures beyond the "boundaries of climate without the dominant human images of the present" (24).

The exertion of human dominance has continued to bring forth the "end of nature" (McKibben 1). Insisting on human dominance in manipulating nature, Cary Wolfe, in his essay, "Condors at the End of the World," (2018) addresses the "natural" and, at the same time, "not so natural" nature of extinction. He argues that nature is not given but is made under the current conditions. He notes the human-animal distinction, despite numerous claims that humans and non-humans constitute the same environment. Wolfe uses the example of the California condor, a bird that is extinct in the wild but is being conserved and raised in captivity. The projects for protecting, conserving, and saving endangered species demonstrate the biologists' endeavours in designing "stabilizing apparatuses" in order to preserve animals (Wolfe 114).

Ashley Dawson's tracing of a "radical history of extinction," (15) in *Extinction: A Radical History* (2016) can be linked with Wolfe's view of extinction, for Dawson's view of biodiversity loss and extinction relates to the capitalist maneuvering of nature. He argues that in the human psyche, nature is deemed to be an asset in their possession for extracting resources. This overt utilitarian motif of humans towards nature no longer preserves its 'natural' essence, and natural breeds of nature are now artificially produced by corporations. Dawson writes,

> Suddenly, things like seeds, once freely traded by peasant farmers the world over, have become scarce commodities, and are even being bred by agribusiness corporations to be

> sterile after one generation, as product farmers in the global South have aptly nicknamed "suicide seeds." (13)

Dawson analyses extinction through a scathing critique of capitalism, pointing out that radical conservation efforts to reverse extinction through genetic engineering and synthetic biology techniques are simply manifestations of ambitious capitalist motifs. Such attempts at reviving extinct species compel them to behave in accordance with their artificially designed and ordered genomes. Dawson contends that such strategies for reintroducing substitute species in the wild are tools in the hands of humans, confining animals to bioregions provided by humans. Dawson reiterates Rob Nixon's view of "ecoparochialism," discussed in his essay "Environmentalism and Postcolonialism," (238) in conservation endeavours for ignoring species permeability between bioregions and spatial networks connecting diverse spaces. He further affirms that radical conservation techniques hardly fall short of being modes of capitalist possession of nonhumans, eventually dispossessing them radically. Finally, he raises the question, "Why bother about extinction?" (98), to which he answers directly, "Human beings depend on other species for our existence" (98). This re-emphasises the overwhelming thoughts regarding extinction being human-centric.

With this, I turn to explore Ursula Heise's *Imagining Extinction: The Cultural Meanings of Endangered Species* (2016), which concentrates on those "human stories that frame our perception and relation to endangered nonhumans" (5). Heise argues that a section of conservationists and environmental enthusiasts are devoted to the cause of preserving biodiversity and protecting endangered nonhuman species, but the narratives of endangered species and biodiversity loss are presented from human perspectives. Heise insists that

biodiversity, extinction, and endangered species are "primarily cultural issues," (5) inevitably requiring human interventions. Echoing the view of "end of nature," Heise acknowledges the beginning of the Anthropocene, the epoch that sees "nature at risk" (6) in the sense that nature is stained with modern human intrusions. "Nature" no longer retains its meaning as an independent entity (McKibben 58), rather, it is something that is man-made and official (McKibben 58). Such a version of nature reduced to a stained object in human hands has galvanised political activities and conservation policies, which again bring nature within the cultural paradigm. This reiterates the cultural significance of extinction and biodiversity loss, eclipsing the idea that biodiversity loss is subjected to scientific investigations.

Heise's endeavour in finding the "cultural meanings" of extinction and endangered species can be extended to identify the bio-cultural significance of extinction, as highlighted in *Extinction Studies: Stories of Time, Death, and Generations* (2017). The editors of the volume, Deborah Bird Rose, Thom van Dooren, and Matthew Chrulew, explain the primary endeavour of the volume is to introduce extinction stories, involving an extinct species and its bio-cultural impact. Keeping in mind that the current process of extinction is anthropogenic in nature, human beings' involvement in the extinction of species in the 'nature' can hardly be downplayed, while not ignoring their entanglement with nonhuman species. As a result, rather than focusing solely on the biological decline of nonhuman species, the extinction stories in the volume broaden their narrative realms to include the cultural significance associated with extinction of each species. Highlighting species extinction as part of the human experience once again dismantles the conventional notion of 'nature' as an organic element untouched and uninfluenced by humans. As Cary Wolfe asserts in his foreword to the volume, "any human registration of the so-called fact of nature is always already radically denaturalized because the

symbolic and imaginary realms that make the presence of nature manifest to us in their different ways are anything but 'natural'" (vii). Perhaps a radical denaturalization of nature is required to bridge the gap between nature and culture and recognise their interconnectedness. The realisation of the nature-culture interlink is essential for understanding the bio-cultural significance of an anthropogenic extinction event, as is the pressing need to ask, "which forms of human life are driving these catastrophic processes of loss, and in what other diverse ways are humans drawn into and implicated in extinction—and its resistance?" (6). The chapters in the volume attempt to address these questions to foreground the authors' understanding in ethical and practical practices while exploring the critical human-nonhuman entanglements for comprehending the radically endangering extinction event, triggering ambivalent and pluralistic responses.

Another book that contemplates the impending extinction is Elizabeth Kolbert's *The Sixth Mass Extinction: An Unnatural History* (2015). Kolbert argues that the Earth is in the midst of the sixth mass extinction, and the process is unnatural because it is human-driven. She asserts her claim by conducting field studies and reporting from the grounds where the endangered species dwell. Kolbert, through her journalistic style of writing, relates her experiences while studying the process of species extinction, and for that, she reaches remote corners of the planet like Panama, the Pacific Islands, the Arctic Circle, and so on. She specifically examines the role of humans in causing climate change that will supposedly wipe out 20% to 50% of planetary species within a century. While exploring the 'unnatural history' of the sixth mass extinction, Kolbert revisits the previous Big Five mass extinction events that caused the catastrophic annihilation of an entire generation of species on Earth. This implies that the Earth is heading toward its sixth extinction event, only this time it is human-induced,

thereby subjecting the event to human will. Humans are now in charge, with the responsibility of driving other species to extinction on the one hand and conserving and preserving species habitat on the other. Therefore, the "unnatural history of extinction" ensures the present denaturalised conditions surrounding species in the Anthropocene—the geological epoch of humankind. Kolbert's examination of the human role in the extinction of species and their possible role in pre-empting the extinction, implores us to act urgently, and she writes, "Right now we are deciding, without quite meaning to, which evolutionary pathways will remain open and which will forever be closed. No other creature has ever managed this, and it will, unfortunately, be our most enduring legacy" (268-269). Kolbert insists, citing the intricate interconnections between species, that humans are becoming victims of their life-altering activities, disrupting the planetary ecosystem, and necessitating a proactive approach to preserving the ecological balance.

The anxiety over humans' shrinking chances of surviving has led to several speculations regarding the fate of humans. Fred Guterl's book *The Fate of the Species: Why the Human Race may Cause its Own Extinction and How We Can Stop It* (2012) examines the growth of human force on the planet and the "unintended consequences of the success of Homo Sapiens" (9). The intention of the book is to show how bad things can get in the future, causing the ultimate catastrophe—human extinction. Guterl is interested in considering the "worst case," (9) encouraging us to think of the scary part of anthropogenic practices. He is anxious about the increase in the global population, which only hints at the dominance of human beings on Earth. A growing human population implies increased use of technology and the release of toxic gaseous elements, which will have a significant impact on the climate. This eventually will result in adverse consequences unfavourable for humans, pushing them toward extinction.

Guterl reflects on past mass extinction events, focusing on the fifth one that has dramatically wiped out dinosaurs, making us aware of how dramatic a mass extinction event may be. Also, he makes a case for "superviruses" (13) having the ability to initiate a pandemic, causing "a global catastrophe" (10). Highlighting the precarious conditions of the planet, Guterl attempts to stimulate awareness regarding the decline and decay of the planet, pondering how humans can survive such a calamity.

Similarly, Clive Hamilton's *Defiant Earth: The Fate of Humans in the Anthropocene* (2017) ponders the fate of the human species. Hamilton, following many other thinkers, probes into the role of humans in the Anthropocene, insisting that "nature is no longer passive and fragile, suffering in silence . . ." (42). Hamilton is intrigued by the fate of humans on a defiant Earth that reacts and revolts in response to the sufferings inflicted on it. The book explicates the "new anthropocentrism" that is based on the understanding of "Earth System," which binds humans and the rest of the planetary beings together (42-43). Hamilton presents a radical view of the Earth as not something subjected to human dominance and views the Anthropocene as an irreversible human folly — "too late to go back to the Holocene" (43). The author presents human beings as the "embedded subject" (44) who has emerged "as a kind of tragic figure, the central agent, unable to fulfil the dream of modernity, to extricate ourselves from nature and rise above it. The new anthropocentric self does not float free like the modern subject, but is always woven into nature, *a knot in the fabric of nature*" (44). Hamilton emphasises the dual role of human agency in the context of his framed term, "new Anthropocentricism," as a supposedly dominating force on the Earth, yet burdened with the embedded moral responsibility of owning it while remaining bound to Gaia. Now, human beings' being entwined with the fate of the earth has thrust upon them a greater responsibility for mending the earth,

argues Hamilton. He further contrasts "new anthropocentrism" with "ecomodernism," as Hamilton succinctly lays out the philosophical difference between the two: "If ecomodernism and the new anthropocentrism both see the human as the special creature with indisputable power on Earth, the latter does not share ecomodernism's humanistic faith that the special creature can decide its own fate" (67). "New Anthropocentrism" bears the tragic awareness that human fate rests on the fragile Earth system, reminding humans of their vulnerability.

A critical introspection in the future of human existence has prompted thinking about what lies beyond the finitude of time. If extinction is perceived as a catastrophic moment in the history of Earth, encompassing all species, then it rings the death knell for all living species inhabiting the planet. Considering extinction as that fateful moment in history, there have been unending speculations and thoughts related to what comes 'after extinction'. This question is addressed from multiple perspectives in Richard Grusin's edited volume, *After Extinction* (2018). The essays in the volume anticipate a future of human and nonhuman beings and investigate the implications of extinction in connection with its theological origin and with socio-culture (Grusin viii). *After Extinction* is compiled, it picks up on the "speculative spirit" (vii) of the time that requires a combined theorisation about the future. In his introduction to the volume, Grusin explains that the dominant human understanding of nonhuman species extinctions has been supplanted by the need to understand extinction from a broader perspective. The conventional understanding of extinction puts humans in a superior position, causing harm to nonhumans only, which intrinsically justifies the nature/culture distinction, now no longer tenable. The consensus on the fact that the present extinction process is anthropogenic in nature asserts the cultural dimensions of extinction. Moreover, Grusin argues that the problem of periodizing the Anthropocene has led to extended speculations about the

future of humans and the effects that will be reflected in the unknown deep future. The focus therefore turns to the "after extinction," a probable attempt to periodise human existence in order to anticipate what lies ahead across multiple timescales. Grusin points that the thinkers assembled in the volume are interested in premeditating the "after" which prompts the "premediation" to "mediate future events, a logic that has intensified in the twenty-first century" (x).

The important set of questions – What lies "after extinction"? How will humans endure climate catastrophes? How will climate change affect the Earth's landscape? What will be the relevance of human and nonhuman lives in relation to climate change? – all formulate the logic of the present age, instigating the graphic premediation of future events through audio-visuals and through literary texts. Such questions now seem to haunt humankind, and the hauntings find expression through artistic presentations. The theorisation of speculative times has encouraged critical engagements with the subjects of climate change, extinction, and time, leading to the production of literary works abounding with their respective authors' boundless imaginations. Such authorial journeys into the future have sparked critical debate, and the body of critical inquiry has opened theoretical perspectives in the context of fictions dealing with climate change and the hauntings of catastrophic endings. These fictions are clubbed under the following categories, sometimes used interchangeably – "Anthropocene Fiction," "Climate Change Fictions" (or Climate Fictions), "Speculative Fictions"[2] and "Apocalyptic Fictions." Adam Trexler has coined the term "Anthropocene Fictions" to designate those literary works exhibiting consciousness about the Anthropocene. Trexler, in *Anthropocene Fictions* (2015), analyses the interaction of the Anthropocene with literature, focusing on ecocriticism and scientific studies of the environment, and little on climatology. Trexler relates his understanding

of fictions about climate change to the Anthropocene, which he argues, is already a reality and not a prognostic situation. Trexler is critical of treating the Anthropocene and climate change as speculative subjects that may evoke climate change denial and result in delayed actions. While Trexler's analysis is based on scientific findings and the practical effects of the Anthropocene as manifested through climate change, Antonia Mehnert, in *Climate Change Fictions: Representation of Global Warming in American Fictions* (2016), urges readers to look beyond the scientific objective description of climate change and emphasises the importance of understanding climate change as a subjective socio-political construction.

Jemma Deer in "Quenched: Five Fires for Thinking Extinction," (2019) assumes a critical tone about the excessive and overwhelming speculations about the future, resonating with Trexler's criticism of the same. She interrogates, "How soon is soon? On which time scale are we to read this line? Would it be too hot in a matter of hours, weeks, years, or centuries?" (Deer 2). Such speculative questions instill fear about the irreversibility of extinction amid the ongoing 'climate chaos.' Referring to J.G. Ballard's novel, *The Drowned World* (1962), Deer stirs the 'pre-human memories,' that provoke a fear for the unknown 'post-human' planet. This relates to Frederic Neyrat's claim in "Ghosts of Extinction: An Essay in Spectral Politics" (2019) that we are not only "threatened by the sixth mass extinction of plants and animals, by climate change, the impoverishment of the soil, global pollution, and other environmental disasters, but also haunted" (88) by them.

The engagement of literature with extinction continues to interest critical thinkers. *Fiction and the Sixth Mass Extinction* (2020) examines twentieth-century fiction through the lens of the sixth mass extinction. Jonathan Elmore edits the volume, focusing on the urgency of

telling stories during the sixth mass extinction. Like most, this volume too engages with future possibilities while insisting on the importance of stories in the present that point toward the future. The essays collected in the volume examine stories that talk about the objective reality of extinction as an event that causes the decline of nonhuman species and of humans as well. Again, the thinkers assembled here realise the call to act against extinction that leads to these interrogations: "What kinds of humanity caused this event and what kinds may live through it? What cultural assumptions and values led to this event and which ones could lead out of it? What relationships between human life and this planet allowed the sixth mass extinction, and what alternative relationships could be possible" (6-7)?

The exploration of extinction stories extends in Sarah E. McFarland's *Ecocollapse Fiction and Cultures of Human Extinction* (2021). However, she is unwilling to consider any sort of positivity associated with climate change and extinction, as she labels those Climate Change Fictions depicting human survival as 'unrealistic,' which advocate human exceptionalism. McFarland prefers using "Ecocollapse Fiction" instead of 'Climate Change Fictions,' insisting that "Ecocollapse Fiction" is 'realistic' in presenting the collapse of the ecosystem, considering human-nonhuman and nature-culture entanglements. She analyses those twenty-first century novels that speculate on human extinction "without interventions of as-yet uninvented technology, interplanetary travel, alien invasion, or other science fiction elements that leave hope for rescue or long-term survival. They build ecocollapsed earth worlds that are scientifically probable in the Anthropocene" (8). Therefore, McFarland is in favour of a realistic depiction of the future, which for her is apocalyptic in nature and only conjures images of eco-collapse. In this way, she seeks to dismantle "human superiority" to demonstrate "how individuals exist as parts of landscapes of coevolutionary processes" and are part of

political and cultural interchanges (113). McFarland sees human extinction as an objective reality with finality and no possible alternatives.

Thus, all the works acknowledge the Anthropocene as a major historical and temporal change in the history of the Earth and humankind. Extinction, by now, is assumed to be the reality of the Anthropocene and is considered anthropogenic in nature. It is anthropogenic in two ways: the extinction this time is human-driven, and simultaneously, it encapsulates the threat of the annihilation of humans. There is a consensus on accepting the sixth mass extinction as an impending threat to all kinds of species, including humans. The common adjectives qualifying extinction are catastrophic, apocalyptic, disastrous, declining, radical. Therefore, extinction is commonly viewed as a catastrophic event that will occur at some point in history—a futuristic history, causing a radical decline in the habitat of species. Also, extinction is said to bring about "the end of the world" and "the end of time." Such phrases conceive and denote extinction as a final event, probably hinting at having nothing "after extinction." Again, on the contrary, there is a lot of speculations about and graphic representations of the Earth after the sixth mass extinction, sometime in an extended future. The focus therefore, is seemingly more on the post-extinction conditions, and less on the timeline in which the extinction may occur. The time recording extinction is incomprehensible, unknown, and lies in the deep future, only subjected to disparate speculations and conjectures. The existing body of works seems to ask the following questions, but obviously with no gratifying answers – When will the future begin? Are we already a part of the contested future? Are we really going to die? What ways can we avert extinction? How urgent is it to act? Such questions reflect the ambivalent reactions that the subject of extinction stimulates. Such queries embed the dichotomous tendency of human

beings to view the future spread over multiple timescales, while garnering an urgency to suggest a condensed lifespan for humankind.

1.6 Theorising Extinction and Survival

Using these perspectives as a starting point, this work examines the likely thinking that underpins the trend of speculating about climate change and extinction. There is too much discussion on and around the subject of extinction in relation to climate change. The prognosis of a climate catastrophe has fuelled researchers' and authors' imaginations of desolate and alienated landscapes devoid of human species. The knowledge of five mass extinctions and the impending sixth generates innumerable possibilities for the post-extinction phase of the Earth. Climate change is hastening the degeneration of species' habitats, resulting in a climate catastrophe. This rapid and radical decline in biodiversity and the resultant extinction of certain species have evoked fear and anxiety among us, suggesting that human species are as vulnerable as the rest, given their 'entanglement' with nonhuman beings and their environment. This elicits a dread of non-existence, a fear for the absolute absence of humans on a speculative timescale. The anxiety for a hypothetical inhuman or human-free future intensifies the human urge to live, as Claire Colebrook says, "I face extinction, therefore I must continue to be" ("Fragility" n.p.)[3]. It hints at human resistance to extinction and the urge to extend human life in the face of extinction. The fear of possible human erasure has resulted in ambivalent responses to extinction that are largely technologically driven. The programming of 'superintelligence'[4] and robots, the development of artificial intelligence (AI), projects of brain emulation[5] and mind uploading on computational platforms, bioengineering, terraforming[6], and methods of de-extinction through an advanced use of synthetic biology all indicate the continuation of life

evading extinction. The possibility of human extinction makes humans aware of their frailty, but life extension efforts challenge that frailty, inducing the imagination of a speculative future of transformed humans and life forms. Humans are thus bound by the dichotomous tendency of leaping beyond human limits while remaining bound to the lived (Colebrook, *Death* 45). On one level, this encourages thinking about excessively expanded timescales, while on another level, it constantly urges human beings to view across multiple timescales, which can seem like an improbable task. The thinking of multiple timescales breeds varied images related to a far-fetched and over stretched future. Also, the beginning of such a future is unknown, and the timeline is largely variable and incomprehensible. In this context, these questions — Why do we think so much about non-existent and unknown tomorrow? Why are there excessive speculations and hypotheses on climate change and extinction without a definite knowledge about the timescale? Why is there such a great deal of anxiety and fear about extinction, if it is recognised as a natural process? — gain relevance. These questions seem to contribute to humans' survival politics, as they concern about the future of humans and the possibility of their survival in times to come. The questions imply the anxiety involving the speculations about human survival, which seems majorly concerning the persistence of human agency in times unknown and unseen. This thesis thus argues that the excessive speculations about extinction and post-extinction scenarios result from human beings' innate urge to survive amid the thoughts of ecological catastrophes that may challenge their survival skills and threaten their habitation on the planet. It intends to examine extinction not as a nihilistic concept, but as one that inextricably carries the seeds of survival along with death. This work will view extinction as a threshold concept, implying living on the edge.

The examination of extinction as a threshold concept—a life-in-death condition—is informed by the "ecological awareness,"[7] (Morton 88) concerned with understanding the human-nonhuman interrelationship and the volatile environment. The anxiety about the extinction of nonhuman species arises from the cognizance of the human-nonhuman interdependence. This awareness has intensified the consciousness among biologists and environmentalists about conservation and the protection of endangered species by removing them from their natural habitat. As a result, those animals are forced to adapt to a human-made environment. So, conservation acts only reaffirm the towering presence of human beings over nonhuman beings, bringing conservation endeavours under the critical radar of anthropocentrism. Usually, humans' exploitation of nonhumans faces scathing cultural criticism for the obvious marginalisation of nonhumans. But conservation endeavours are conventional representations of humans' heroic acts, devoted to the cause of saving the dwindling species on the Earth. Thus, humans in the Anthropocene are either represented as villainous destroying agents on the planet, or as heroic restoring beings, protecting our planet to ensure the continuation of life on it. Humans displacing nonhuman species to push them to the periphery constitutes the survival politics of humans. At the same time, restorative measures like the conservation of endangered species, sustainable use of natural resources, controlling carbon emissions, and conserving marine life inform the survival politics of humans. In both cases, humans contest to remain the power wielding subjects to guarantee the predominance of their agency, either through their deliberate undermining of nonhuman lives or through their eco-conscious actions to hinder climate change for ensuring the sustenance of lives on the Earth. The exaggerated speculation on extinction and the human tendency to defy it are thus, components of human survival politics. By speculating about futuristic scenarios, human beings

aim to foster a collective consciousness about extinction to address the pressing need to avert it. Then at this juncture, the questions that may be asked – Are we afraid of the end of the Anthropocene? Are we devising methods and figuring out ways for prolonging the Anthropocene? Is the Post-Anthropocene viable when viewed from the present point of time? Is the end of humans a near possibility, despite their constant thinking of continuing their lives on the Earth? The subsequent chapters of the thesis will argue that human beings' concern about extinction primarily pertains to the survival of their own kind. The speculations are largely about humans' renewed survival strategies in futuristic and imaginary altered climatic conditions. No matter how many critical arguments are posed to decentralise human agency, there is hardly any moment when humans do not tend to make their mark, either firmly or subtly. The anxiety stems from the loss of humans as a species instead of other species' loss. The thesis seeks to contest that human beings through their imaginary ramifications, intend to leave human remnants in the future as well, thereby extending the Anthropocene in time and thinking.

1.7 Anthropocene, Extinction, and Climate Change Fictions

Anthropocene thinking which is intensified by the threat of extinction in the current era finds expression in quite a few twenty-first century fictions. The literary engagement with Anthropocene thinking is crucial to the investigation of climate crisis, its consequences and the ways survival strategies can be devised. However, several nature writers and environmentalists have complained about the tepid literary responses to climate change in the early half of the twenty-first century. Bill McKibben, in his essay titled "What the Warming World Needs Now is Art, Sweet Art," pointed out the absence of the issue of climate change in literary

representations, highlighting the problem such a lacuna breeds: "When people someday look back on our moment, the single most significant item will doubtless be the sudden spiking temperature. But they'll have a hell of a time figuring out what it meant to us" (n.p.). Robert Macfarlane too argues in favour of the crucial role literary writers play in helping us "imagine the impact of climate change" (n.p.) in "The Burning Question." A decade later, in *The Great Derangement: Climate Change and the Unthinkable*, Amitav Ghosh implores us to tell stories about climate change, which he believes are lacking in "serious fictions" (16). Ghosh emphasises the cultural importance of climate change, as we are living in an era of change, and a lacuna in the cultural representations of climate change means there will remain no cultural archives preserving the traces of the current times for future references in an altered world (17). Ghosh is probably urging for a serious and realist approach to the vital issue of climate change in the current times instead of just passing it under the categories of "fantasy," "horror" or "science fiction," which are hardly considered probable. Ghosh demands that the present literary representations of climate change instead of being trapped in the improbability of an outlandish imagination, must be based on the present objective realities of climate change. The last decade however, has seen a proliferation of fictions concerning climate change and the probable threats associated with it. The realisation of the importance of narrating future events about possible climatological changes has led to such rapid growth in Climate Change Fictions (also sometimes referred to as Cli-fi), today recognised as a literary genre, a source of climatological imaginations for assessing the impacts in the future. Climate Change Fictions aim to educate readers about the socio-cultural implications of climate change and extinction, while also conveying a cautionary message. Also, "Fictions allow us to hold ideas in our heads about time and space and causality and connection that are difficult to articulate," says author,

James Bradley in his interview to Casper Henderson in 2019 (n.p.). Climate Change Fictions while dealing with climate change as their central subjects aid their readers to formulate a composite understanding of climate change, spread over time and space, otherwise difficult to comprehend. These authors of these fictions ground their understanding of climate change in the scientific reports regarding the climate crisis and their other day-to-day experiences pertaining to their environments.

The Intergovernmental Panel(s) on Climate Change (IPCC) has produced reports on the unprecedented climate change and rapid biodiversity loss. The reports represent the collective efforts of climate scientists from around the world who have made efforts to report from the front lines of the crisis and from areas of the planet that are experiencing extreme climate precarity. The emphasis has remained on the planet's vulnerability to anthropogenic activities, which are causing imbalance in the Earth system and, as a result, threatening human existence. The Paris Climate Accord of 2015 was an agreement reached between political nations to limit global temperature rise over the next fifty years by limiting carbon emissions. Otherwise, the consequences are supposedly grave, causing a rise in sea level, drowning major coastal cities and islands across the planet. Such kinds of scientific predictions and reports over the last decade have affected many, increasing the predilections for cultural representations and mediations of climate change along with its dire consequences. With the scientists now hinting toward the sixth mass extinction, which is why this age is often referred to as the "era of extinction," the Climate Change Fictions are now increasingly interested in the subject. These fictions project extinction from varied perspectives, which the thesis intends to observe and examine.

The novels have alluded to climate change issues in a broader sense to include the impacts of climate change on culture, politics, socio-economics, and human behavioural patterns. The representations of global warming and the graphic depictions of futuristic disasters in popular films and Climate Change Fictions have generated a great deal of paranoia, anxiety, and fear towards the environment and call for immediate action for survival. The existing critical works on Climate Change Fiction tend to emphasise the disaster and the fear of irreversible catastrophe. The fear of an impending eco-disaster is heightened by demeaning anthropogenic forces causing the disaster and mass extinction. But the fictions centering on climate change have also shown the human urge to survive in the face of extinction across timescales and have highlighted the adaptable qualities of humans in a world, considered to be uninhabitable at present. Through their presentations of futuristic climatic conditions, the authors seem to propose newer ways to survive, suggesting that human conditions may worsen, but they may continue to survive fighting those adverse conditions. Through an extensive analysis of selected twenty-first century Climate Change Fictions I strive to examine extinction and the implications of survival beyond the finitude of recorded time. I intend to argue that this expanded view of extinction goes beyond the conventional perception of extinction as a catastrophic event. For an extensive and contextualised examination of extinction, I have chosen four twenty-first century novels – Jeanette Winterson's *The Stone Gods* (2007), Kim Stanley Robinson's *New York 2140* (2017), Claire Holroyde's *The Effort* (2021), and Jeff VanderMeer's *Hummingbird Salamander* (2021). These novels concern extinction from varied perspectives, but are bound by their commonality of future speculation. The novels are recent and discuss the existing climate crisis embedded in cultural responses and anthropogenic practices in the techno-capitalist era. They capture the pulse of the age, delving deep into

ambitious human projects and endeavours aimed at transforming and transgressing life as we know it. Recognising the potential of the selected novels focused on an all-encompassing idea of climate in exploring the possibility of human life through transformation and transcendence across time and space, I seek to theoretically intervene in these fictions from the critical vantage point of extinction and survival.

The focus of the thesis is on extinction from varied perspectives, and each chapter that follows critically intervenes in one work of twenty-first century fiction. Additionally, it highlights how recent Climate Change Fictions engage with climate urgency and the threat of extinction. The centrality of the argument in each chapter pertains to the understanding of extinction in relation to the probability of survival, despite innumerable assumptions regarding the wiping out of human species from the surface of the Earth. The speculative images of the planet in an expanded timescale play in every fiction, selected for theoretical analysis, therefore, making it an important ground for discussions and contestations. I attempt to look to the future with the authors of the selected fictions, not to reinstate the sense of finality associated with extinction, but to rethink extinction as a phenomenon beyond the striations of finitude, unfolding into multiple possibilities toward survival. Also, I argue that the paranoia around human extinction only reflects that human beings are essentially anthropocentric, despite exhibiting their apparent will to look beyond their species and to move toward an anti-anthropocentric or a post-anthropocentric worldview.

1.8 Outline of the Succeeding Chapters

The introductory chapter provides the theoretical outline for the thesis, based on which I will scaffold the succeeding chapters. Herein, I have arranged the following chapters focusing on

the thematic and theoretical treatment of the selected novels instead of arranging them based on the chronological order of those novels' years of publication.

The second chapter, "*The Stone Gods*: Speculating Extinction in Diverse Timescales," concentrates on Jeanette Winterson's *The Stone Gods* (2007), which is designed as a cautionary tale to alert its readers about the impending anthropogenic disasters. Winterson's novel, divided into four parts, spans extended timescales, with each section emphasising the repeated human errors that are to blame for ecological disintegration. In each part, she intends to frame a mnemonic history of humankind, ultimately declining into a degenerative state. Billie Crusoe and Robo *sapiens* Spike are the central figures who forge connections between the four parts, which are otherwise disconnected with each other in time and space. I situate the text within the discourses of the Anthropocene, which is not only a timescale but also a way of thinking about human existence in the present. Keeping in view the speculative nature of the novel, I extensively examine the author's employment of expanded timescales to assess the impacts of climate change beyond the visible human experience. I argue that the author is explicitly aware of the deterioration of human civilisation on all timescales, and she condenses time and brings speculated timescales within the Anthropocene paradigm through her deliberate flexing with time. Winterson looks back at the past with her consciousness of the present, and her imaginary future bears the remnants of the present. Therefore, I argue that her thinking converges on her concern about the critical conditions of human beings across multiple timescales, insisting that her thoughts are perhaps essentially anthropocentric.

The third chapter, "*The Effort*: Trauma and the Anticipation of Extinction in an Apocalyptic Timescale," deals with Claire Holryde's *The Effort* (2021) which depicts a

speculative situation of the Earth under the threat of mass extinction from a comet rushing towards the planet. The threat of mass extinction within a short and visible time frame traumatises human beings across the world, causing a mass psychological breakdown. The situation of mental breakdown disrupts the livelihood of human beings and causes an absolute disarray in human behaviour, robbing them of their civilised qualities. The impending disaster and the dread of death instigate human effort around the globe to save human civilization by averting the path of the meteorite with the help of a payload. The fear of losing human agency directs the global human civilisation to combat the meteorite impact on the Earth in order to ensure survival. In the chapter, I will outline the urgency behind controlling the comet impact, which is a practical problem, in contrast to the lackadaisical attitude toward controlling the ongoing climate change impacts, which seem to be distant and unfathomable realities. I view the comet as a haunting spectre in an ephemeral state between real and unreal, threatening human lives immediately, while the climate change process is like "slow violence" that "occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space […]" (Nixon, *Slow Violence* 2). Also, I seek to examine the psychological breakdown of an entire civilisation and the trauma bred from acute anxiety and fear of the haunting spectre of extinction under the dreadful impact of a celestial body. I argue that human civilisation disintegrates under the threat of the anticipated extinction before it has occurred. I argue that the anticipation of extinction instigates "pretrauma" (Kaplan xix), causing distress and paranoia among humans. In addition, I refer to the trauma related to extinction as "extinction trauma," which we are enduring at the present at some level owing to the overblown speculations about the catastrophe at an unknown temporal point in the future. I view the "extinction trauma" as a part of present-day human existence, triggered by the imaginations about a disaster. The

troubled human conscience also seeks ways to survive the disaster, thereby reemphasising the Anthropocene thinking for the continuance of human existence.

The fourth chapter, "*Hummingbird Salamander*: Awareness of Species Extinction and the Role of De-extinction in Species Revival," investigates the awareness of extinction of species and its impact on human survival, contextualised in a critical study of Jeff VanderMeer's novel, *Hummingbird Salamander* (2021). The novel delves deep into the murky realms of animal trafficking, the capitalist commodification of animals, and ecoterrorism. The chapter explores the envisioned eco-future through the lenses of the "multispecies knots of ethical time" (Rose 125), which expose human-nonhuman relationship within the paradigm of "ethical time." "Ethical time" affirms "connections between generations of living beings, and relationships among currently living beings" (Rose 128). Moreover, I argue that anthropogenic mass extinction may "murder the ethical time," (Rose 128) causing disconnections between species spread over time and space and hence hindering the evolution of ecology. Furthermore, I examine the ethical grounds of taxidermy and the radical methods of de-extinction to conserve the biodiversity on the planet. Biomimicry, which is used as a medium to exhibit an ultra-affinity toward extinct animals like that of the hummingbird and the salamander, is a point of my critical examination in the chapter. Ultimately, I argue that consciousness about the extinction of species is the result of the recognition of the interspecies relationship, which augments the fear of human extinction and the eventual loss of human agency. Thereby, the emphasis is on the necessity to "change the world" (VanderMeer 347) in order to ensure the sustenance of life.

The fifth chapter, "*New York 2140*: Foreseeing a Rise in Sea Level and Fostering Climate Positivity in the Era of Extinction," focuses on Kim Stanley Robinson's *New York 2140* (2017), which is situated a century into the future from the present. The novel speculates on an inundated New York in the twenty-second century and, accordingly, envisions the struggles and ecological hazards of people in the city under such a hostile condition. Robinson, known for fostering climate positivity in the face of a climate emergency and probable extinction, adheres to his positivity in this novel as well. Robinson speculates on the dire state of the planet, submerged in sea water, a situation most climate scientists speculate on due to the probable rise in sea level in the future. I view the novel's physical and temporal situation from the present and draw references to the IPCC Assessment Report(s) and the Paris Agreement (2015) that have agreed to arrest the global temperature by 2050 in view of unprecedented climate change and sea level rise. Additionally, I critique the capitalist system, which undermines the ecological balance by favouring human endeavours over nonhuman existence. The Anthropocene discourse already holds industrial carbon emission responsible for climate change, which is why this epoch is sometimes referred to as the "Capitalocene," (Malm 417) specifying that this is the age of capitalists, not humans — a homogenised group. Finally, I contend that by adopting the critical tropes and popular embodiments of climate change—the rising sea level and declining habitat of polar bears — the author initiates a thought about extinction of species (including humans), while also depicting these tropes of climate change in instrumenting socioeconomic and political changes. Therefore, it hints at the continuation of life in the face of extinction, while inspiring climate positivity[8].

Ultimately, the concluding chapter, titled "Conclusion: Extinction: Thinking and Beyond," will sum up the findings the thesis aims to reach through the critical readings of the

selected twenty-first century fictions on climate change and extinction. In the concluding chapter, I seek to formulate "extinction thinking" in connection to the "Anthropocene thinking." Through the term "extinction thinking," which I will elaborate in the concluding chapter, I intend to explicate that human conscience is fixed on extinction and this fixation is more with extinction of human species and less with extinction of nonhuman species.

Therefore, I seek to examine extinction from varied perspectives, while thinking of the survival of species. The second chapter deals with extinction through the analysis of diverse and speculative timescales; the third chapter explores the psychological impact the constant threat of extinction may have on us, causing more harm to the world collectively, even before extinction has occurred; the fourth chapter penetrates the grim world of eco-terrorism and animal trafficking, (re)explores the human-nonhuman interrelationship, and interrogates the radical conservation endeavours and de-extinction methods to control the biodiversity loss; and the fifth chapter while highlighting the most anticipated issue of sea level rise as an image for climate change, outlines the importance of fostering climate positivity in the face of such a dire climate crisis and under the threat of mass extinction. Ultimately, by viewing the subject of extinction through diverse theoretical lenses, I will argue that extinction is a concept that intrinsically harbours humans' urge to survive under threatening situations. This thesis is thus, my attempt to develop extinction as a concept beyond the conventional thought of a catastrophic event. While rethinking extinction I seek to argue that extinction may not simply indicate the end, but may be viewed as a beginning, defying the finitude of time and space.

Notes

1. The Anthropocene Working Group (AWG), an interdisciplinary research group, committed to the assessment of the Anthropocene as a geological epoch, was established in 2009 by the Subcommission on Quarternary Stratigraphy (SQS). It is a constituent body of the International Commission on Stratigraphy (ICS).

2. "Speculative Fiction" is broadly associated with those fictions which are based on speculative scenarios that do not exist. Such fictions produce alternate realities and narratives, encompassing genres like "Science fiction," "Climate fiction," "horror," "fantasy," dystopian fiction." Margaret Atwood's the *Maddaddam Trilogy* (2003, 2009, 2013) is famously associated with the genre of "Speculative Fiction."

3. Claire Colebrook discusses on the human perception of extinction and climate change in her lecture titled "Fragility, Globalism, and the End of the World" at Yale University on 6th November, 2017. While commenting on the human response to extinction, she borrows from the Cartesian thought of "I think, therefore I am" and says, "I face extinction, therefore I continue to be."

4. Nick Bostrom uses the term 'superintelligence' in his book *Superintelligence: Paths, Dangers, Strategies* (2014). to refer to "intellects that greatly outperform the best current human minds across many general cognitive domains" (71). The term is used to denote a higher sort of intelligence which can be attained through machine intelligence. According to Bostrom, such advanced intellect can be divided into three forms – first, "speed superintelligence," refers to its ability to perform all tasks like that of human intellect, but

at a faster rate; second, "collective superintelligence," implies that such an intellect can aggregate smaller intelligence while performing; third, "quality superintelligence" suggests that superintelligence can outperform human intelligence in quality and is smarter. This issue is elaborated in Chapter II.

5. Brain emulation is a process in which the whole brain of an individual is scanned in order to emulate the individual's mental state or mind on a digital platform. It is also referred to as mind uploading since the mind of an individual is uploaded on a digital platform. This is a strategy to artificially replicate the working of human brain in a software.

6. "Terraforming" combines Latin *terra* meaning earth or land with the word 'forming.' Therefore, "terraforming" refers to the process of modifying or transforming a planet in order to support life.

7. Timothy Morton in *Being Ecological* (2018) explains the phrase "ecological awareness." He says, "ecological awareness gives you a world in which everything is relevant to everything else, but is also really unique and vivid and distinct at the very same time" (88).

8. "Climate positivity" refers to sustainable development and a sustainable way of living by adopting carbon neutral policies and executing economic activities, aimed at zero carbon emission. By adopting such alternative technologies and methods that are clean and green, the Earth can possibly bounce back. This can hinder the rise in global temperature and consequently halt climate change. "Climate positivity" is extensively discussed in Chapter-V of the thesis.