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Title of the Thesis: "Sustainability of Ecological Pluriverse via CoFutures in Vandana Singh's Fiction"

Registration No: **759-FLL/MSENG/S23**

Accepted by the Department of English, Faculty of Languages & Literature, International Islamic University, Islamabad, in partial fulfillment of the requirements for the MS degree in English.

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF PHILOSOPHY IN ENGLISH

To

Department of English (F.C)
Faculty of Languages and Literature
INTERNATIONAL ISLAMIC UNIVERSITY ISLAMABAD

2025

Declaration of Authorship

I, Javeria Hafeez, under the registration number 759-FLL/MSENG/S23, hereby declare that this thesis is entirely my work and that all critical and other sources have been clearly and adequately acknowledged, as and when they occur in the body of my text.

Date: May, 14, 2025

Javeria Hafeez

Signature: 

DEDICATION

To my parents; for their endless love over the years

ACKNOWLEDGEMENTS

First and foremost, I would like to express my sincere gratitude to my research supervisor Dr. Sonia Irum for her support, timely feedback, and patience. I will always remember her conversations, kindness, and words of encouragement with fondness. It has been a delight to work with her.

I am also thankful to my professors at International Islamic University, Islamabad who have been a source of constant inspiration for me in my academic and professional endeavours. I have learnt so much from them over the years, and I will always be indebted to them. A special thanks to Dr. Neelam Jabeen for helping me out in configuring my research idea during coursework. Her insights have been truly valuable.

I would also like to thank my best friend Afifa Tahir for her lifelong friendship, love, and encouragement. She has always been there for me when the chips were down, and her presence has been a source of motivation and comfort for me. I would also like to give a shout out to my very special friends Hadia Waqar and Shamza Maryyam for their companionship and camaraderie. I am so grateful for all the memories we have made together.

Lastly, I would like to especially thank my parents and siblings for the endless and unconditional love they have showered upon me over the years. They have been extremely patient, and have provided me with the freedom and space I needed to complete this dissertation. Their love, and belief in my potential keeps me moving forward. I hope to make them proud one day.

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ABSTRACT

This study looks into the ways in which the selected science fictional stories imagine alternative futures for local people where they combine traditional ecological wisdom inspired by local cultures, ecological and architectural practice with modern scientific technologies. In so doing, it not only transcends the binary established between scientific technologies/local wisdom by Western science fiction narratives, but also helps to develop localized forms of livelihood practices and sustainable settlements. With the help of a textual analysis of four texts from Vandana Singh's oeuvre of fiction, i.e. *Indra's Web*, *Requiem*, *Entanglements*, and *Reunion*, this thesis argues that rooted in a distinct cultural and colonial past, these narratives undertake the task of articulating a more nuanced representation of climate change and environmental depredation by combining local wisdom about environment, land, architecture, and multispecies existence with scientific technologies. Therefore, the futures that emerge out of these imaginaries serve to delegitimize the Western appropriation of SF futures by bringing in alternative imaginaries that do not re-centre the Western gaze. Therefore, this thesis rejects the Western notion of a single, universal future by tweaking the idea of CoFutures put forth by Boddhistva Chattopadhay. By deploying the framework of CoFutures, Arturo Escobar's idea of "Pluriverse," and the idea of deep ecology extended by Bill Devall and George Sessions, this study argues for a relational and pluriversal approach to envision just, sustainable, inclusive, and participatory futures for indigenous communities grappling with climate change. This research showcases that solutions to climate crises must arrive locally and be suited to the local contexts; thereby creating avenues for inclusivity, ecological sustainability and community building.

Chapter 1: Introduction

Since times immemorial, humanity has been fascinated with the idea of imagining future societies. From Plato's *Republic*[1] to Thomas Moore's *Utopia*[2], the mythologies about imaginary utopias and dystopias have existed in various forms from literary texts to socio-political critiques and satires. However, the stories we envision about the future represent a far deeper connection – to the world, to ourselves, and to humanity. The genre of science fiction has been a kernel for such future imaginaries that function both as a mirror and window to the popular ambitions and desires. However, the act of imagining and speculating different kinds of future societies is a "creative endeavour" as well as a "political and philosophical one" (Kamal 17). It entails that the project of imagining the future is always at risk of "coloniz[ing] the future" according to the dominant perspectives and privileges of the time in which such a future is described (Jameson 228). Therefore, early science fiction from the Global North has frequently been recognized as affiliating with imperialist ideology, which discredits non-European traditional sciences. By relegating local knowledges and local wisdom to the periphery, these narratives depict a uniformed and universalized account of reality by superimposing Western scientific and technological advancement; without taking into account the cultural and historical specificity. In this way, it creates a divide between scientific technology and local wisdom and depicts them as incompatible with each other.

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[1] Written around 375 BC, Plato's magnum opus *Republic* is a Socratic dialogue which mainly concerns the 'imagination' of an ideal city-state ruled by a just, philosopher king; with other defining tenets such as justice, harmony, the ideal city etc.

[2] Published in 1516, Thomas More's *Utopia* is a socio-political satire and a philosophical work that envisions an imaginary but ideal society i.e. utopia; also elaborating its social, political, and economic structures.

However, speculative fiction emerging from non-Western imaginaries such as South Asia envisions futures for the local communities that draw on indigenous histories and cultures without necessarily centring the Western gaze (Kamal 19). With its polyphonic coexistence of diverse indigenous epistemic traditions, it counters the monolithic rhetoric of the Western techno-scientific approach (Karmakar and Ghosh 9), and therefore imagines sustainable futures by showing that the local communities are using scientific apparatuses combined with local wisdom to fight the environmental crises at hand. In this research, I analyse Vandana Singh[3]'s selected works of fiction i.e. *Indra's Web, Requiem, Entanglement, and Reunion*, to argue that Singh is employing the genre as a means of cultural decolonization by reconciling scientific technologies and local knowledge, thus transcending the binary of scientific knowledge/local wisdom propagated by the West to create an ecologically sustainable modern world. Rooted in a distinct cultural and colonial past, these narratives aim to articulate a more nuanced representation of climate change and environmental depredation by combining local wisdom about environment, land, architecture, and multispecies existence with scientific technologies.

I read Singh's fiction to explore the ways in which existing storytelling traditions from South Asia open up a pluriverse of possibilities for sustainable and equitable futures beyond Western forms of knowledge. Therefore, to "recenter" SF away from Western, Anglo sources to reclaim speculative literature from its entanglements in colonial, problematically techno-optimistic history, advocating for attention to futures emerging from the rest of the world (Chattopadhyay 2014). Consequently, this proliferation of futures does not result in a singular definitive

[3] Vandana Singh is an emerging Indian science fiction writer who has also a PhD degree in Theoretical Physics.

article—"the future." Rather, they affirm the possibility of what Chattopadhyay describes as CoFutures (no hyphen). CoFutures are complex, coeval—they arise separately from different sources, and com-possible—they are possible together, requiring "solidarity" in "recognition of difference" (Chattopadhyay 2020, 2021). While they might bear similarities to SF, these global futures do not rest upon the same epistemological foundations as they develop from marginalized worldviews, suggesting more just and sustainable relationships between human communities and with the more-than-human world. CoFutures is a move towards a better world for all and promises "democratic, pluralistic, diverse, cacophonous, multicultural futures" (Chattopadhyay 21). Through this research, I maintain that the selected futures envision pluriversal and relational CoFutures which do not re-centre the Western epistemological frameworks, and present alternative, nuanced, and embodied future imaginations.

I connect the idea of CoFutures with the conceptualization of "Pluriverse" and "Deep Ecology" and foreground localized forms of existence to argue that to seek out other futures, we need to seek out other worlds in the present (Letkemann 207) as anthropologist Arturo Escobar (2018) reminds us, we already inhabit a pluriverse. Escobar explains the concept of "the Pluriverse" as "a world where many worlds fit" —and foregrounds the slogan that "another world is possible" (9). But today's "heteropatriarchal capitalist modern/colonial world system" (xii) wants us to believe that there are no alternatives. However, in a world facing complex challenges, or, as Escobar puts it, "a civilizational crisis" (xxxii), we need alternatives: alternative realities, alternative possibilities, and alternative futures. Escobar explains in the book's preface that modernist politics heavily relies on ontological dualisms, such as the east/west, nature/culture, object/subject, fact/value and reason/emotion divide. On

the other hand, ontological or pluralistic politics draw on the concept of radical relationality: "all entities that make up the world are so deeply interrelated that they have no intrinsic, separate existence by themselves" (xiii). He emphasizes that the struggles related to autonomy, territory and communality "require an explicit ontological framing that advances the principles of interdependence and relationality" (xix). By using this framework, I aim to show that traditional knowledge and science are compatible in a number of ways. And by transcending this binary between them, this holistic approach will not only dismantle the hierarchical binary thought but also create avenues for a relational worldview.

Supporting my pluriversal and relational worldview is the principle of Deep Ecology first put forth by Arne Næss[4]. In this thesis, however, I use Devall and Sessions theorization of deep ecology to establish that the major principles of deep ecology resonate highly with the values of indigenous approaches and traditions rooted in local cultures. Singh reflects all the ideals of deep ecology in her futuristic works selected for this research, which depict the harmonious co-existence of nature and technology as potent tools to revive an ecologically conscious way of being in the modern world. Through a comprehensive analysis of the selected texts, I argue that deep ecological reading of these texts can help us in transcending the binaries between human/nonhuman, western science/non-western tradition (Devall and Sessions 65), thereby cultivating a non-dominant ecological consciousness (Luke 180). By bringing in indigenous practices that are not ecologically exploitative, speculations about alternate methods of scientific knowledge production cast some doubt on the European

[4] Arne Naess was a Norwegian philosopher who coined the term 'deep ecology" in his article "The Shallow and the Deep, Long-Range Ecology Movement" published in 1973. Deep ecology as a concept asserts the interconnectedness and equality of all life forms on Earth.

conception of modernity and promote "alternative modernities" (Dirlik 8). In a world where environmental crises impact marginalized nations and communities inequitably, envisioning the potential future through science fiction turns out to be an act of resistance for postcolonial green writers. It imagines ecologically sustainable futures by showing that the local communities are using scientific apparatuses combined with local wisdom to fight the environmental crisis. In this way, the futures that emerge out of non-Western imaginaries are pluriversal, complex, relational, and ecologically sustainable – presenting an alternative worldview where different approaches can not only co-exist but complement each other.

1.1 Statement of the Problem

Western futurist fiction is increasingly becoming an instrument in marginalizing non-Western cultures from the future. By superimposing Western scientific and technological progress, it relegates local knowledge to the periphery and imagines a universal, techno-orientalist[5] vision of the future for all humanity. Through this research, I reject the notion of a single, universal future as proposed by the West. I argue that the imagined futures in the selected Indian fiction do not rest upon the Western epistemological foundations and open possibilities for South Asia to imagine its own futures. These futures or CoFutures are developed from marginalized worldviews. Therefore, they suggest more just and sustainable relationships between human communities and the more-than-human world. This research advocates for a

[5]David S. Roh in his book states that techno-Orientalism investigates the representation of Asia and Asians through the lens of technology in literary, cinematic, and new media contexts. This concept critically analyzes the stereotype that depicts Asians as either excessively advanced or intellectually underdeveloped, implying a necessity for Western enlightenment and intervention. (Roh, David S. *Techno-Orientalism: Imagining Asia in Speculative Fiction, History, and Media*. Rutgers University Press. 2015)

relational and pluriversal approach by examining Indian ecotopic[6] SF stories that envision the futures where local characters blend traditional ecological wisdom inspired by local cultures, histories, and folklore with modern science to create sustainable lifestyles. My research helps dismantle the binary established by the West between scientific technologies and local knowledge and suggests that they can be used together, as solutions to climate crises must arrive locally and be suited to the local contexts.

1.2 Research Objectives

1. To explore the role of postcolonial ecotopic SF in dismantling the binary between scientific knowledge and local wisdom.
2. To examine the ways in which the selected ecotopic SF offers a pluriversal framework to envision alternative futures.

1.3 Research Questions

1. How do the characters in the selected postcolonial ecotopic SF blend local ecological wisdom, indigenous knowledge, and folklore with scientific technologies?

2. In what ways does a relational and pluriversal approach imagine sustainable and inclusive futures in the selected postcolonial ecotopic SF?

[6] relating to or involving adaptation to specific local environment conditions.

1.4 Methodology

I have conducted a qualitative research through a close textual analysis of selected texts i.e. *Entanglement*, *Requiem*, *Reunion*, and *Indra's Web* by an Indian science fiction writer Vandana Singh. I support my argument using Arturo Escobar idea of "Pluriverse" from the book *Pluriversal Politics: The Real and the Possible,* and the idea of CoFutures explained in the book *The Routledge Handbook of CoFuturism* edited by Taryne Jade Taylor, Isiah Lavender Ill, Grace L. Dillon, and Bodhisattva Chattopdhyay. I also draw upon the principles of "Deep Ecology" put forth by Bill Devall and George Sessions in *Deep Ecology.*

I use Escobar's idea of a "Pluriverse" to argue that indigenous knowledge about climate, ecology, and architecture can be used alongside modern technological advancements to envision futures for local communities that do not necessarily follow or re-centre the Western gaze. This holistic approach not only dismantles the hierarchical binary thought but also creates avenues for a relational worldview. I will support this by using Devall's and Sessions' principles of deep ecology to argue that indigenous ecological practices follow the ideals of deep ecology as the transformative environmentalism of deep ecology essentially advocates reducing human impact on Earth, preserving biodiversity, residing in small, self-reliant communities, and substituting sustainable modes of economic and energy production. Such futures or "CoFutures" imagined by postcolonial writers such as Singh enable pluralistic, just, and sustainable relationships between human communities and the more-than-human world.

1.5 Significance of the Study

By challenging the uni-directional techno-orientalist approach of Western science fictional narratives, my research contributes to identify the ways in which South Asian fiction can provide alternate ways to engage with global climate change discourse. My analysis of the representations of South Asian futures by combining local ecological knowledge and scientific technologies highlights that South Asian narratives have the potential to reclaim the futures by telling their futures in their own ways, suitable to the local contexts. My research paves the way for a pluralistic and relational outlook on finding solutions amidst the impending climate crisis.

1.6 Chapter Division

My dissertation consists of five chapters. Chapter 1 presents a comprehensive overview of the study, encompassing the problem statement, research objectives and questions, research methodology, and its significance. Chapter 2 deals with the literature review and help formulate an analytical framework for research. Chapter 3, titled "Beyond the Dichotomies: Transcending the Binary of Scientific Knowledge and Local Wisdom" deals with the analysis of the selected texts to explore the ways in which the characters in the selected fiction combine scientific prowess with local knowledge about by ecology, climate, architecture to develop context-based approaches to fight climate change. Chapter 4, titled "Imagining Alternative Futures: Inclusivity, Ecological Sustainability, and Community Building" explores how the alternative futures or CoFutures envisioned in the selected texts develop localized forms of community building and solidarity, particularly among small communities, and how a sustainable community can develop new infrastructures for collaboration, sharing, communication by leveraging technology for a community's benefit. Chapter

5 outlines the outcomes of the research and provide recommendations for future researchers.

Chapter 2. Literature Review

This Literature Review seeks to trace out the relationship between the origin of science fiction as a genre and the Euro-American imperial projects of colonial expansion to highlight how SF as a genre has a long-standing association with the Empire. Having said that, however, my study also explores the ways in which the tools in SF can be re-appropriated by the non-Western and indigenous people to decolonize the colonial motifs in the genre by drawing upon local episteme(s) and knowledge systems.

2.1 Science Fiction and Empire; Imperial Tendencies and Colonial Motifs in Western Science Fiction

Known for its speculative potential and imaginative prowess, the genre of science fiction has predominantly served as a mirror reflecting the popular ambitions of the societies in which it emerges. Historically, SF has been appraised as a genre of the fantastic; a mode of writing that falls outside the canon of literary fiction, and which blurs the boundaries and connections with reality or common sense (Kerslake 1). However, underneath an apparently a superficial and cosmetic appeal, SF as a genre is credited for opening a number of debates with reference to many strategic cultural discourses. As a result of these cultural rhetoric(s), we are able to decipher the significant power and potential of a genre that tends to broaden the knowledge of people about the important issues concerning humanity (1). However, in order to discover the foundations of SF as a genre, it is paramount to examine the conditions that are responsible for its development; the role and manipulation of political powers i.e. the Empire and its imperial projects and colonial abuses within the genre. In this part of my literature review, I tend to explore how the genre of SF is founded upon a colonial base.

With reference to the political context surrounding the origin of the genre, a number of connections have been made by different scholars between colonialism and the emergence of SF. For example, as a period of vast colonial expansion, the late 19th century had seen a surge in science fictional narratives, predominantly in the developed countries involved in imperialist projects (Simoneti 186). A number of studies have been done in this regard, for example, one of the principal studies in of Istvan Csicsery-Ronay, who in his essay "Science Fiction and Empire" problematizes "science fiction as an expression of the political-cultural transformation that originated in European imperialism and was inspired by the ideal of a single global technological regime" (231). He further explains that the majority of the countries which produced science fictional narratives are those who, in some way, were involved in expanding their national borders via colonial projects: Britain, France, Germany, Soviet Russia, Japan, and the US (231). Similarly, John Rieder in his book *Colonialism and the Emergence of Science Fiction* (2008) also points out that the origins of science fiction must be framed in the context of imperial culture; starting in the early British and French ambitions of the global conquest in the late 19th century, and then materializing in the emerging imperialist prospects of other developed nations such as Germany, Russia, United States and Japan in the 20th century. Reider begins his book with an axiom that "colonialism is a significant historical context for science fiction" (2); noticing that SF emerged in the late 19th century during the most belligerent phase of Western imperial expansion. He further asserts forcefully that "no informed reader can doubt that allusions to colonial history and situations are ubiquitous features of early science fiction motifs and plots. It is not a matter of asking whether but determining precisely how and to what extent the stories engage colonialism" (3). According to Reider's argument, both colonialism and science fiction are the by-

products of the ideology of modernization; as they are concerned with a manifestation of a progressive (utopian?) future (Flannery 182); therefore making it a complicated debate in terms of the ways these agendas are exercised.

For example, in his review of Reider's book *Colonialism and the Emergence of Science Fiction,* Eoin Flannery contextualizes Reider's argument that the congruence of colonialism and science fiction in terms of their ideology cannot be limited to only abstract and philosophical lexicon; rather science fiction itself functions an intermediary in colonialism's materialist agendas (182). As a result, in most of the SF narratives, the idioms and metaphors related to scientific discoveries, refined as a result of imperial exercise, became canonical characteristics in the genre of science fiction—the lexicon and other metaphorical devices used in science fiction are taken as the signs of racial and anthropological difference in terms of superiority versus inferiority, us versus them etc; a phenomenon usually referred to as 'Othering' explained in detail by Edward W. Said[7].

In his work *Orientalism: Western Conceptions of the Orient* (1978), Said first articulated the postcolonial notion of an "other." He argued that in order to come up with a conception of an 'us', there must be someone who is 'not-us,' an "other;" since both the subjects make sense of themselves through a relation to each other via a mutual process of exclusion (Said). This conception can be found in the majority of SF narratives, especially pertinent in those texts that evoke visions about colonization (Kerslake 8). For example, one of the most popular tropes in science fiction are of a

[7] A Palestinian-American literary scholar, Edward W. Said is known for his abundant contribution to the field of Postcolonial Studies. His seminal word *Orientalism* (1978) is believed to be the cornerstone in literary critical studies concerning anti-Empire narratives.

stranger/alien/other (i.e. extra-terrestrial, technological, or the human-hybrid); and a Strange-land (a faraway planet or a distant part of our own, waiting to be conquered); and both these myths serve the basic pillars of Western colonial project (Kamal 18). As a result, plots and motifs about the exploration and contact with unknown peoples in the strange, faraway lands were principally inspired by the narratives of colonial encounters, with racial stereotypes serving as a backdrop. Therefore, several postcolonial debates about race, epistemic erasure, and colonization are incorporated in order to better understand SF's dealings with empire; therefore building a relationship between the imperial project from the past with the potential neo-colonial empires of the future.

Walter D. Mignolo in his book *The Darker Side of Western Modernity: Global Futures, Decolonial Options* argues that the process of colonization works via 'coloniality of knowledge' which is characterized by "the colonial matrix of power" (16), implying that Western knowledge production is central to the working of modernity. Mignolo further argues that the colonial matrix is founded upon a number of "heterogenous historico-structural nodes, bounded by the "/" that divides and unites modernity/coloniality, imperial laws/colonial rules, center/peripheries" which arise as a result of universal thinking in the development of a modern/colonial world (16-17). They also replicate into a variety of other racist and gendered parameters for example Western political and social ideology is marked by an absolutely exclusive idea of what constitutes an ideal human being i.e. white, European, heterosexual, male as a standard and transcendental category of 'the human'. Having in mind this standard and universal blueprint, the modern, white, male figure is placed at the top of the hierarchy with other gendered and racialized subjects as inferiors or others. As a result,

these differences have been used historically to legitimize and justify the political pursuits and other forms of colonial violence.

In addition, this Eurocentric us/them binary continues to structure the modern world; with Europe presenting itself as the ultimate paradigm of knowledge making, scientific innovation, and modernity; while the racialized others are relegated to the periphery as uncivilized, regressive, and primitive. A Chinese American digital artist Dawn Chan argues that the practices of othering are an ongoing manifestation of the 'oriental gaze' where non-Western bodies are racially segregated and appropriated to protect the white imagination (105). For example in the popular movie *Blade Runner*, Asian bodies and cultures are white-coated and reduced to interchangeable technologies deployed for white sexual and other forms of gratification (Mitchell and Chaudhury 323). Similarly, there are a number of other texts, movies and popular culture phenomenon where non-white bodies, places, and traditions are viewed as exotic, and are thus sexualized for the purpose of white entertainment such as *Star Trek, Star Wars, Indiana Jones movies, Dune* etc.

Moreover, in addition to the postcolonial debates surrounding SF, the influence of empire in SF has also been analysed vis-à-vis the techno-scientific empire and scientific/technological revolution of the 21st century. By tracing the genealogy of the genre from its origin in imperial ambitions to the contemporary neo-colonial enterprise, we see the genre at "he interface between the pressures of global capitalist evolution and national techno-culture" (Ronay 236). Ronay emphasizes that as empires serve to establish a single, global, political power, located not only in a recognizable territory, but in terms of a phenomenon and a world order enforced by

“technologies of control;” as its characteristic space is “horizontal, expansive, and limitless; it exhausts and suspends historical time, pragmatically taking up typological justifications from the past and the future as the occasion demands” (237). To make it clear, the force and power of the empire transcends spatiality and temporality. It is everywhere and everywhen, in the day to day workings of people, institutions, technologies, and the state.

Therefore, it is important to study the role of technology in advancing the imperialist projects. From the beginning, a variety of Western SF narratives have largely fantasized technological progress in the form of terrestrial invasions; space explorations; and encounters with extra-terrestrial beings. However, there are numerous implications embedded within these narratives related to Western superiority in terms of technological prowess, and the subsequent relegation of native cultures to the periphery, categorizing them as primitive or exotic other. Consequently, science fiction is believed to function as historically conformist in idolizing colonial epistemologies where science and technology is established as a marker to measure progress. Therefore, technological development is believed to be not only a prerequisite for the physical expansion of the empire, rather it functioned as a vital driving force (Adas 145). As a result, SF a genre that largely problematizes the role of technology as a source of power in the Empire, emerged largely in those societies where technology had been enforced as a system for domination. As imperialist states were at the forefront of technological development, their ambitions had what Thomas P. Hughes calls "technological momentum" (111). As a result, 19th century science fiction also largely focuses on the stories of Western exceptionalism grounded in technological progress.

For example, in her essay "A Technological View of Nineteenth Century and Globalization in Science Fiction and Global History," Sobia Kiran traces out the connections between technology and 19th century science fiction. She points out that majority of the historical as well as literary narratives coming from 19th and 20th century can be read as "manifestations of techno-mania, as they place technology at the centre of their plot" (Kiran 25). Moreover, according to Bruce Franklin, the term science fiction was first coined by William Wilson in *A Little Earnest Book upon a Great Old Subject* in 1851, and he defines it as a tale that tells scientific truth (Franklin 24). Franklin takes the emergence of science fiction as a historical phenomenon, and correlates it to the rapid scientific progress that provides "literary space to visualize our future, racial history, and our place in the cosmos" (23). For instance, several studies read the early SF works of writers such as Jules Verne and H.G Wells in terms of them using technology and science in pursuit of their imperial ambitions and their execution. Novels such as *From Earth to the Moon (1866)* and *Around the Moon* (1870) by Verne, and *The First Men in the Moon* (1901) by Wells have been analysed in terms of the pursuits of colonial expansion of the two empires Britain and the U.S as the employ science and technology to meet their ends (Kiran 36). Therefore, with its emphasis on science and technology, Western SF narratives predominantly work to conjure up the role of West as technologically advanced and superior, thereby rendering non-Western cultures inferior and primitive. By constructing the stories of Western dominance and exceptionalism, Western SF partakes in the rhetoric of the binary between West/East, Us/Them; by using the same technological devices which governed the processes of colonization and imperialism (Kiran 44). To explain it further, this literature review further analyses how imperial tendencies are reflected in terms of the imagination of futures in Western SF narratives.

2.2 Colonizing the Future; Imperial Tendencies in Western Futurist Fiction

In his analysis of the evolution of future studies, Ziauddin Sardar in his article "Colonizing the future: the 'other' dimension of future studies" argues that future studies has become a discipline in its own right over the last century. Since its emergence in the 1960s, it has evolved as a discrete scholarly and intellectual activity (179). After World War II[8], a well-curated pattern can be traced out in futures studies in Western SF where the main question lies in understanding how futures studies has functioned as an instrument for the marginalization of non-Western cultures from the future (179). However, it is during the 1980s when future studies is believed to have become complacent with Western ambitions and desires. As a result, it evidently solidified the frameworks and mechanisms through which a new breed of technology came into existence; which was mainly concerned with the issues of domination, control, human relationships, communication and scientific technologies, cyber worlds and artificial intelligence, environmental change etc. (181). However, what caught the attention of Sardar is the underlying purpose behind strategically developing and leveraging technology; which he believes is to develop a future landscape where it can be deployed to enhance the strategies in order to ensure that the status quo is maintained; whereby not only Western control but the domination of non-Western cultures continues unabated.

In brief, what Sardar is suggesting is the axiom that the future is well and truly colonized (181). He terms this technocratic and business-dominated dimension of

[8] Ziauddin Sardar in his article "Colonizing the future: the 'other' dimension of future studies" states that in the post-war era, the US was gradually attaining its status as the global superpower; and the major source of its power was the military and technological expansion. He implies it to be the reason of a common motif found in the futurist studies till 1960s: the technological expansion in the West, and the relegation of the non-West cultures to the periphery (1993: 100).

futures studies 'the Columbus affliction' which implies that just as Columbus was driven by a crisis within Europe to sought new worlds and to exploit and colonize them[9], a large segment of futures studies also seeks new arenas to conquer (181). However, not all future studies are concerned with a Westernized, technological vision of the future. Sardar offers that the Columbus affliction in future studies is counter-balanced by what he calls a 'More syndrome.' Sir Thomas More, popular name in English literary canon, discovered the cure to Europe's miseries by drawing on an idealized picture of non-European people that Columbus discovered in America. His *Utopia* is a classic literary example which represents the idealized vision of 'the native' and non-Western cultures for the first time in English Literature; which later became the central feature in a variety of Western discourses. The embodied and lived realities of the unknown lands, where people had different worldviews and different models of knowing and being, were ignored by the West for their projection of entirely European ideas and epistemologies. On similar lines, the 'More syndrome' in futures studies replicates this tradition. Like the traditional utopias such as More's, many contemporary SF writers appropriate the ideas, realities, and experiences of non-Western societies and project them as visions of Western, secularized future (Sardar 181). However, in so doing, they produce a grotesque parody of non-Western thought, philosophy, and epistemology, completely overshadowing and eliminating the authentic versions of the future of the native people. The expansive cosmology of non-secular, non-Western, and local traditions is totally evaporated. In most cases, non-

[9] David E. Stannard in the book *American Holocaust: Coloumbus and the Conquest of the New World* argues that the Columbus's discovery of a "new world" and the subsequent European exploitation of the native Americans was the most massive act of genocide in the history of the world. He begins his book with an exploration of the enormous diversity and rich history of the life in the Americas before the arrival of Columbus in 1492; and the subsequent marginalization, exploitation, and colonization of the native people, resulting in the annihilation of almost 95% of the native population (Stannard 1993).

Western are first borrowed from the original sources and then repackaged within the frameworks of Western humanism, in order to be re-sold to the native people (182); which is precisely what colonization of knowledge is about.

Consequently, it can be established that despite the claims made by Western futurist SF about depicting the universal future for all humanity, majority of the futurist discourses coming from White imaginary are precisely concerned with safeguarding the future of "*whiteness"* (Mitchell and Chaudhury 310). Here, whiteness is not merely a marker of color, race, or genetics. Rather it comprises of a specific set of historical, socio-political, cultural, and economic frameworks hinged upon Eurocentric episteme, and spread via global phenomenon such as colonization, globalization, and capitalism (311). For example, these habits of racism, segregation, and marginalization are apparent in the way contemporary SF works i.e. the ways in which protagonists are often framed in the contemporary 'end of the world' SF narratives as capable of 'saving' the world in the face of any natural disaster, alien invasion, or a supernatural threat. Most of these protagonists or scientists are represented as white, male thinkers; whereas the non-White people are always 'saved' by the white heroes. By bracketing the indigenous knowledge as ways of living, and by superimposing the Western technological and scientific prowess, a single and universal future for all humanity is envisioned; thereby limiting the number of varied and multifarious discourses.

In addition, many SF narratives also ignore the unequal distribution of environmental risks, a phenomenon widely studied under environmental racism (Mitchell and Chaudhury 313). For example, in the article titled "Wordling beyond the 'end' of 'the world': White apocalyptic visions and BIPOC futurisms," Audra

Mitchell and Aadita Chaudhury point out that by rendering important issues in futurist SF such as climate change, environmental harm etc. as global problems, and invoking narratives about common human good and 'all lives matter' irrespective of color and race. Western SF and academic scholarship ignores the frameworks of unequal distributions of harm, threat, and environmental risks; which are pertinent problem in reference to capitalism and globalization (313-314). As a result, a universal future for all humanity is envisioned and the responsibility for ecological threats is attributed to 'humans' in general (314); a phenomenon that is often rejected by the postcolonial ecocritics as unequal distribution of environmental risks, ecological imperialism, and ecological racism are very pertinent issues in the context of Postcolonial Ecocriticism[10].

As a result, Western SF is characterized by a number of limitations when seen in the context of postcolonial cultures. As the West sees itself to be the harbinger of scientific age, and relegates the non-West to be in the theological era of the pre-capitalist time, it undermines the potential of the non-West cultures to offer broader or progressive visions for the future. Therefore, it is important to look at the postcolonial turn in SF, particularly from the South Asian context, to contextualize how non-Western SF imaginary has the potential to contribute in the broader SF framework.

[10] Graham Huggan and Helen Tiffin define Postcolonial Ecocriticism in their book *Postcolonial Ecocriticism: Literature, Animals, Environment* as a burgeoning alliance between postcolonial and environmental studies which highlights the how processes of colonization have affected and impacted the environment of the colonies as they trace out their reverberations and continued results in the postcolonial countries. A major idea in postcolonial ecocriticism is environmental justice, with a special focus on land, animals, plants, and economic and political control of the environment.

2.3 The Postcolonial Turn; The 'other' side of Science Fiction

Recent academic scholarship in the field of SF studies suggests genre's complicity in the imperial and colonial projects of the Empire. In the previous two sections of the literature review, I focused on how this complicity is projected in the imagination of futures in contemporary SF. The imperial turn in SF has been analysed from the perspective of Csicsery-Ronay, Reider, Kerslake, and others. However, science fiction exists in a space where it can promote negative ideas of colonialism and racism but also critiques them. Many academic studies in the recent years have led to the emergence of postcolonial approaches in SF. For example, the exploration of otherness and marginality, and its potential for imagining more equitable futures, lends itself well to a postcolonial ethos – a potential which many science fiction writers from colonized and formerly colonized places have embraced, and which has led to a hybrid kind of science fiction known as 'postcolonial science fiction.' It can be defined as a particular kind of science fiction that acknowledges and then subverts, in different ways, the genre's genealogical and ideological debt to colonialism (Kamal 18). Moreover, Jessica Langer in her book *Postcolonialism and Science Fiction* also suggests that a postcolonial approach to science fiction must be skeptical of the origin of the genre; however, it must not resort to total rejection of the genre itself. Instead, she believes that science fiction can play a crucial role in the conceptualization of a postcolonial identity (8); suggesting that SF as a genre is useful to develop a more nuanced and contemporary idea of what it means to be a postcolonial in the age of climate change, science, technology and artificial intelligence; the issue usually discussed in SF.

As a result, Postcolonial SF is an important intermediary in this process of not only developing a modern postcolonial identity, but also in decolonizing the future which is set against the Western paradigms. For example, Langer further suggests the ways in which postcolonial SF has appropriated the similar conventions of the genre of SF in different ways; in order to explore the mechanisms through which Western SF discourse has interacted with colonialism and the cultural production of colonized peoples. It also foregrounds the concept that indigenous systems of knowledge production are scientifically valid as the Western knowledge systems (Langer 8). Just as Walter Mignolo suggests that "there is no modernity without coloniality" (155), Langer implies that there can be no science-fictionality without coloniality as well. Therefore, the adjective "postcolonial" serves to intermediate in the conflict between the two polar thoughts: SF as a genre complicit in imperial projects on one hand, and SF as offering critical resistance on the other hand; debating that the adjective postcolonial sets it apart precisely from the Western SF. Moreover, in Ericka Hoagland and Reema Sarawl's view, postcolonial SF is a "middle ground" or "hybrid genre" that documents the "intriguing affinities between two genres [postcolonial writing, and sf] whose own parameters continue to be vigorously contested" (5); thereby making it a solid ground for submission as well as resistance.

Similarly, In *The Routledge Companion to Science Fiction,* Michelle Reid states that postcolonialism looks into the complicated relationship of Self/Other created as a result of the colonial encounter. He explains that SF fantasize encounters with the Other such as aliens; predominantly from the perspective where the Self is dominant (Reid 257). However, what strikes Reid and several other postcolonial SF scholars are the similarities in descriptions of the "other" in these stories, and the

minorities where the aliens are deployed as substitutes for those the marginalized race. Reid further states that "the European colonial project was an ideological 'fantasy' that enabled colonizers to justify their subjugation of colonized people by denying that they were fully human or civilized" (257-258); therefore implying that alien races depicted in the SF narratives are not as appealing for the indigenous people as they are for the Western audience.

However, just as the genre of science fiction has been predominantly used as a vehicle to explore and exacerbate imperial fantasies, it has also the generic tools through which critiques of colonialism and racism can be enacted. It can be deployed as a means through which non-white people can tell their own stories, drawing on their own cultural heritage in different forms. To mention a few perspectives when it comes of non-White SF imaginaries, Islamic futures, Japanese utopias, African models, Indian visions, Arab SF and others come to notice. As Sohail Inayatullah, in response to Sardar's colonising the future, states in his article "Colluding and colliding with the orientals" states that non-Western nations can learn from the idea of alternative futures instead of constantly parroting the one future, one leader, one text vision of the God and the nation-state (192). Inayatullah echoes Sardar's claims in which he points out that futures studies has increasingly become a West-dominated terrain in which the West's basis and foundation of superiority rests in its relation to the Other/non-West. Therefore, Non-Western are deployed only if they serve the Western ideology whether in opposition or agreement (190). However, what Inayatullah offers is a way to imagine alternative futures, outside the Eurocentric paradigms of universality, by bringing in the personalized idiom.

2.4 Decolonizing the Futures; Linking Afrofuturisms, Indigenous Futurisms, and South Asian Futures

As I have elaborated previously, the genre of SF functions as a contested entity which offers resistance as well as submission. For non-Western authors, therefore, it provides a space to re-assert agency and envision alternative imaginaries of futures, which do not re-centre the colonial gaze. However, as the genre of SF is apparently considered popular fiction and a form of low brow literature which you can pick up on airports to read solely for escapism and entertainment; but is never considered worthy of an intense academic analysis. However, over the last few studies, studies about popular genre have brought to the fore vigorous tools which suggest that popular genres such as fantasy, science fiction, horror, crime fiction etc. can serve a political, ethical, and social purpose. For example, academic and writer Daniek Heath Justice suggests that "Fantasy, science fiction, and horror merit consideration as serious literature with ethical import, deserving of critical and pedagogical regard. It is time for a reappraisal of the relationship between realism and the fantastic, especially when considering the work that marginalized writers are doing to challenge oppressive lived realities through the intentional employment of the fantastic to imagine otherwise" (142-143); therefore suggesting that popular genre can help indigenous writers to envision an alternative perception of reality.

For example, borrowing from the traditional SF conventions but modifying them in order to suit their cultural and social context, many Indigenous writers have created within SF their own personalized genre known as Indigenous Futurisms. This term is coined by the writer Grace Dillon and she believes that authors of indigenous futurisms not only deliberately experiment with or intentionally break away from, but sometimes appropriate, accompany, and change the conventions of traditional SF. As

a result, they feel liberated from the conventional constraints of the genre, and have a room to play with context, setting, characters, and form of the novel (Dillon 3); suggesting that indigenous futurisms offer the native writers a space to experiment with the genre to delineate and express their own idiom.

For example, Dillon in her article "Indigenous Scientific Literacies in Nalo Hopkinson's Ceremonial Worlds" discusses the various strands of indigenous futures by arguing that all varieties of Indigenous futurisms can be called as "narratives of *biskaabiiyang"* which is an Anishinaabemowin word and connotes the process of "returning to ourselves," which involves discovering how personally one is affected by colonization, discarding the emotional and psychological baggage carried from its impact, and recovering ancestral traditions in order to adapt in our post-Native Apocalypse world. This process is often called "decolonization" and it requires *changing* rather than *imitating* Eurowestem concepts (Dillon 10). She analyses Hopkinson's SF texts in which he envisions ceremonial worlds which move away from the Euro-American paradigm of techno-science, and create indigenous third and fourth world future-worlds, that draw upon the native history and cosmology. In this way, these narrative attempt to go back to past traditions, co-opt and learn from them, and then use it to move forward as mine the imagination by constructing an alternative image of technology that is in a dialogue with indigenous traditions and practices (Dillon 25). In this way, Dillon attempts to show how indigenous futurisms can lead a way to bring about an alternative imagination.

However, indigenous futurisms as a separated genre has been inspired by a much longer tradition of Afrofuturisms developed in United States as a result of

several Black cultural movements of the 1960s and 1970s[11]. Afrofuturisms as a perspective ensured a separate vision of a black future, distinct from a common white future imaginary (Anderson and Jones viii). Afrofuturisms as a term was first used by Mark Dery in 'Black to the Future: Interviews with Samuel R. Delany, Greg Tate, and Tricia Rose;' and he defined it as a type of speculative fiction which entertains the concerns of Black Americans by drawing upon their distinct cultural histories (Kamal 19). The word 'Black' in Dery's conceptualization thus refers to the previously racialized white future imagination. Therefore, Afrofuturism becomes a politically grounded imagination of possible futures that cater to the Black diaspora living in America; making a connection between the previous experiences of colonialism in Africa, slavery, and the continued discrimination and strategic marginalization they face because of their race and skin pigmentation (Eshun 28). Therefore, it can be said that imagining futures from any lens other than the Euro-American has found a large tendency in the 21st century. Although the word 'Afro' connotes a reference to Africa in general; the deployment in Afrofuturism does not necessarily hint at the racial configuration (Anderson and Jones ix). Rather it refers to a process of decolonization where the word black is used in opposition to white and whiteness as a colonial category i.e., if somebody is not socio-culturally white, they are black (Prashad Karma). As a result of the inclusivity of blackness as a category, and its mobilization to link the past and present to the future; Afrofuturism tends to imagines a decolonised

[11] The Black-American civil rights movement is known as a massive protest lodged by the African-Americans in the 1950s and 1960s against the pronounced racial segregation, mass discrimination, and slavery; resulting in the constitutional amendments in the U.S. Constitution. This civil rights movement also inspired the Black Cultural Arts Movement, influencing the production of literature, music and other art forms in the U.S. by the Blacks. (Smethrust, James Edward. *Literary Nationalism in the 1960s and 1970s: The Black Arts Movement.* The University of North Carolina Press. 2005)

future for all people, irrespective of their race and color (Womack 29); as a result, Afrofuturism implies a decolonized and an anti-colonial version of the future.

Apart from Afrofuturisms, scholarship has also served to engage with a rich and varied tapestry of non-Western futures referred by the acronym BIPOC (Black, Indigenous, and People of Color) futurisms. These futurisms challenge the white-coated perception that there is no alternative futures but only a universal, apocalyptic futures imagined by white scholars (Mitchell and Chaudhury 310). These alternative imaginaries of future strive to imagine plural worlds that move away from the white, Euro-American version of an apocalyptic and dystopian future; thereby embodying multifarious, diverse, and socially and culturally contexts (Mitchell and Chaudhury 310). As a result, these futures aim to reject the homogenizing tendencies of white futures by focusing on plural perspective.

However, in South Asian context, the term postcolonial science fiction is used widely in order to depict the futurist tendencies in South Asian SF. Here, the term Afrofuturisms is also used as a reference or starting point in order to tease out the nuances of what the term South Asian futurisms stands for. Like the ways in which African futurisms imagine sustainable and egalitarian futures by drawing upon the local context, culture, and history; South Asian speculative fiction also envisions futures for South Asia that draw on our own histories and cultures without re-centring the imperial and colonial narratives. South Asian futurisms as a separate genre can be conceived as a genre of SF which appropriates the hard core SF ideas and mixes them in indigenous philosophical and intellectual thought, scientific knowledge, and cultural mythology; thereby rejecting the Western understanding of South Asia

(Kamal 19); in order to establish that South Asian writers have the potential to imagine their futures in their own ways — in turn also making it a decolonial endeavour.

South Asian futurisms assert the importance of the rich tradition of speculative stories that have been a part of the wider cultural landscape of local languages, cultures, mythologies, and folklore. For example, India's rich speculative tradition does not begin with Jules Verne, H.G Wells, or Mary Shelley, but with Ramayana and Mahabharata[12] or the likes of Satyajit Ray[13]; implying that there are many alternative histories of science fiction, and all are equally valid (Gordon 433). For example, Bodhisattva Chattopadhyay uses the Bengali term 'kalpavigyan' for this alternative history of Indian SF as he terms it as "one of the most beautiful words for narrative fiction dealing with science in any language" (437). In tracing the Sanskrit root for the word, Chattopadhyay argues that it comes from two words: "vigyan" refers to the knowledge of the material world as a part of "gyan" which means "all-encompassing knowledge" (436) that is not limited to laboratory based techno-science. Moreover, the first part "kalpana" refers to imagination that enables the escape of an individual from the structures and conventions of law or "vigyan" (437). In part, Chattopadhyay's ideas imply that the indigenous scientific elements present in the local mythologies do not just talk about science in terms of innovation, it refers to a more spiritual and deep connection with reality. It also supports the inclusion of alternative scientific

[12] Ramayana and Mahabharata are considered the two biggest mythological epics in Hinduism, taken from the Hindu religious scripture Bhagwad Gita, and form a rich and organic landscape of Indian culture and civilization. Compared with Homer's *Iliad* and *Odyssey*, these fictional epics serve as a symbol of a long-standing history of speculative writing that dates back to centuries.

[13] A Bengali-Indian film writer and director, Satyajit Ray is known for his unconventional and ahead-of-the-time film direction and writing prowess. Although not popularly known for his science fictional writings, he was nonetheless a SF enthusiast and frequently wrote stories that had science fictional elements in them.

imaginations in the wider SF imaginary, indicating that there are many local, native, and non-Western sources of SF as well.

Similarly, in the South Asian context, the association of Pakistan with speculative/science fiction dates back to centuries old history of dastan genre and Urdu fantasy tradition. A survey by Asma Mansoor and Aroosa Kanwal titled "Pakistani Speculative Fiction: Origins, Contestations, Horizons" provides a glimpse of the evolution of Pakistani science fiction, and traces its origin to the indigenous literary landscape. For example, works such as *Alif Layla* (*The Thousand and One Nights), Dastan e Amir Hamza*, *Tilism e Hoshruba*, *Imran Series* and other popular works have not only functioned as an inspiration for a number of contemporary SF writers, but also point out to the rich history of speculative imaginaries in the local folklore and mythology (Kanwal and Mansoor 244). They also suggest that contemporary writers are re-appropriating the tropes and motifs found in the local dastaan genre and Urdu SF and fantasy tradition to "not only provide a political and social criticism but also weave new worlds of indigenous cultures which are firmly fixed in both myth and alternative futures" (245); suggesting that South Asian and especially Pakistan SF can draw upon its own cultural cosmologies and histories to envision alternative and decolonial visions of the futures. They also mention a number of contemporary Pakistani writers who are doing so such as Osama Siddique, Usman T. Malik, Sadia Khatri, Shazaf Fatima Haider, Bina Shah, Maha Khan Philips, Sidra F. Sheikh and many others.

However, in addition to South Asian futurisms, there are many other terms that are used to refer to the same idea. For instance, Ryan A. D'Souza introduces a concept which he terms as 'desi-futurism' in his article "Imagining a desi future." He argues that he prefers the term desi-futurism over South Asian futurism as he associates the

word ‘desi’ with a collective and local identity market. The work desi derives from the root word ‘des’ (meaning a country); which implies the connotations of an imagined collective homeland as it does not exist anymore. Since South Asia comprises of a number of countries, but not all people who identify with the word desi trace their homeland(s) to South Asia. Therefore, by pointing out to a homeland that does not exist, but by actively imagining the place through association with one another gives the word desi a connotation of an identification and belonging, regardless of the borders and waters (D’Souza 48). For D’Souza, desi in general is a brown category, which therefore can include Arabs, and the Latinx community (48). He tends to articulate a concept of community, where the defining category is desi, which connects the local people with each other but is also global in its scope as he explains that this concept ‘refers to country but does not specify any [particular] country… They [desis] are home wherever they are located’ (48). Therefore, he aims to include the vast South Asian diaspora linked through the concept of des i.e. shared community; thereby denoting its formation to multiple temporalities and spatialities, including homelands and ancestral places wiped out by colonial violence or capitalist interventions; giving a sense of shared belonging, nostalgia, and connection.

In a way, D’Souza’s articulation of the varied desi worlds symbolizes the notion of fluid borders. Furthermore, he dismantles the Western tendency to categorize people into races and nations; and offers a way to move forward with the complexities and impossibilities of identifications that trouble colonial instincts (Rodriguez 5). Some may criticize that in this way, the concept of desi-futurism may become liberal and sectarian in nature. However, it must be noted that the starting point of desi-futurisms was the inspiration from Afrofuturist narratives. Therefore, the desi-

futurism tangent touches on the same issues as Afrofuturism with the same goals in sight, but begins with different reference points (D'Souza 48); implying that the crux remains the same. It can be taken as a critical perspective that dismantles whitewashed imaginations of a technologized future with the experiences of the past-present to write desi versions of the past, present, and future (48); as a result, envisioning alternative categories of future imagination.

Similarly, Chattopadhyay, who is my main theorist for this research, also puts forth the idea of decolonial or anti-colonial futures in his article ""Manifestos of Futurisms." In his manifestos, he talks about confronting the challenges in articulating the idea of the future as a historical artefact, legacy of colonialism, and as an aesthetic marker of generic differentiation. He talks about the politics of 'futurisms' and the meta-theoretical methods employed to shape those futurisms (8). As a result, he defines three different markers: complexity, coevalness, and compossibility (which make the basis for his theorization of CoFutures) to examine how to play with these markers in order to dislodge coloniality from the theorization of futures, and to restructure the aesthetics and politics of futures. He further explains that the positions articulated in these manifestos complement the political praxes of supporting diverse communities, especially the minority ones, within and outside the communities of creators of futurisms (8). These manifestos, therefore, do not serve to decolonize SF: they decolonize the singularity of the future. The colonial foundations and imagery of SF are indirectly decolonized as part of that process. As a result, the world becomes a richer and more complex cultural space (13).

Chattopadhyay further outlines that in the twenty-first century, these manifestos show that we need to move beyond the concise mantras that futures are

unequally distributed; rather he contends that futures and pasts belong everywhere and everywhen (14). It implies that we must search for alternative imaginaries of futures that draw upon diverse communities and ways of living and being in the world. In this way, he attempts to "relocate futures temporally, spatially, epistemically, and in terms of genre" (16). And these relocations are not only build on each other, but are irretrievably interwoven and linked. For instance, temporally, these futures draw upon the deeper historical and cultural pasts which integrates indigenous cosmologies and socio-cultural roots in order to harness alternative pasts for alternative possible futures (16). Therefore, in order to imagine alternative futures, we need to excavate alternative pasts as well.

This research delves into Chattopadhyay's manifestos of futurisms which he terms as CoFutures; representing complexity, coevalness and compossibility. I use the idea of CoFutures along with Escobar's theorization of "Pluriverse" and Devall's and Session's "deep ecology" to argue that the selected stories offer us ways to look beyond the notion of a White, supremacist future where indigenous people and systems of knowledge are at the receiving end only. Conversely, these fictional accounts offer us to look into the ways in which indigenous knowledge about climate, ecology, and architecture can be used alongside modern technological advancements to envision futures for local communities that do not necessarily follow or re-centre the Western gaze. As a result, as a form of indigenous futurisms, such futures or "CoFutures" are viewed as pluralistic, just, and sustainable

Chapter 3. Beyond the Dichotomies: Transcending the Binary of Scientific Knowledge and Local Wisdom

In this chapter, I attempt to answer my first research question: the need to transcend the binary of scientific knowledge/indigenous wisdom propagated by the West, in order to develop a more nuanced and context-based approach to tackle the issue of climate change. I analyse Singh's selected science fictional texts *Reunion, Indra's Web, Entanglement, and Requiem* that envision the futures where local characters blend traditional ecological wisdom about architectural practices and multispecies existence with modern scientific knowledge to develop sustainable approaches amidst the impending climatic and ecological changes. I draw upon Escobar's idea of a "pluriverse" and Devall and Sessions theorization of "deep ecology" to establish that the ecologically sustainable infrastructure and context-based/situation-specific livelihood practices developed in the selected stories by combining indigenous knowledge about environment and scientific technology may help to dismantle the idea of a single world appropriated in Western philosophical discourses; which relegate local wisdom to the periphery and regard modern science as providing the only reliable situation to deal with the problems of the modern world.

The selected stories, however, present a relational and pluriversal world where along with Western sciences and technology, natural and indigenous ways of living are also considered important. My research helps dismantle the binary established by the West between scientific technologies and local knowledge, and suggests that they can be used together, as solutions to climate crises must arrive locally and be suited to the local contexts. Through the textual analysis of the selected texts, I argue that by combining the traditional knowledge about settlements, ecological compatibility, and inter-species existence with scientific technology, Singh depicts an ecologically

sustainable way of living by fostering community building and harmonious relations among human beings and the more-than-human world.

3.1 Indigenous Ecotopia(s) and Sustainable Architectural Practices

The tradition of binary or dichotomous thinking of framing issues in terms of opposites such as reason/passion, male/female etc. forms a foundation for the many varieties of structuralism in Western philosophical thought. Science performs a foundational function in the conceptualization of modern Western political thought; which thereby plays a role in the hegemony of Western knowledge while pushing back other forms of [non-Western] knowledges (Escobar 88); as a result hinting at the interconnection beteeen [hegemonic] scientific practices erasure of local epistemologies via the process of colonization. By articulating a superiority of Western science, Western philosophical endeavours have consciously relegated local knowledge(s) as inadequate, irrational, illogical and unscientific. As a result, "colonialism created an amnesia towards local forms of intellection" (Menon 1) and nurtured the binary thinking i.e. making distinctions between 'western' and 'eastern' ideas (1). Bruno Latour suggests that these binaries serve as building blocks of modernity, and several other ecocritical and feminist scholars also delineate that dichotomous thinking such as in terms of mind/body, culture/nature, masculine/feminine etc. function as a building block of "patriarchal hegemony; reductionist modes of scientific knowledge; disembodied and exclusive ways of existence; and today's ecological crisis" (Escobar 94). Therefore, these pervasive binary divides have resulted in the minimization of intricacy and egalitarianism in our conceptions of the world.

As a result, today's "heteropatriarchal capitalist modern/colonial world system" (Escobar xii) tends to legitimize that there are no alternatives ways of being

in the world. For example, a number of indigenous social movements such as Zapatistas[14] have highlighted the Western assumption of a "One World of a universe with one truth as the basis of neoliberal globalization" (Escobar 86) against which they foreground the idea of a world in which "many worlds fit in" (86). By imposing a One-World World (oww) weltanschauung[15], this Euro-American metaphysics tends to evaporate multifarious embodied realities through its exercise of power and control. However, there are a number of ways to counterpose this universal framing of human reality by bringing to the fore the ways in which multiple ways of being and realities are "patched together into discrete out-therenesses" (Escobar 86). In this way, we can hope to replace the ontological politics of the oww with the one which operates on the grounds of "ontological difference and pluriversality" (Escobar 2014). Escobar introduces the concept of "the Pluriverse" as "a world where many worlds fit" —and foregrounds the slogan that "another world is possible" (9). This idea can serve as a useful tool in bringing about constructive alternative worldviews in a world marked by complex ecological, cultural and political challenges or "a civilizational crisis" (Escobar xxxii), as we need "alternatives: alternative realities, alternative possibilities, and alternative futures;" (xxxii) against Western forms of a single universalized belief in the superiority of science. Therefore, against the backdrop of the current Western civilizational crisis, the struggles to envision new modes of resistance have given rise to a number of alternative worldviews and ways of being, that move away from a

[14] The term Zapatistas broadly refers to the group of people in Chiapas and New Mexico who have been taking part in the anti-globalization struggle for democracy and land reforms under the banner of EZLN (Zapatista National Liberation Front). With the help of their involvement with the indigenous people, this social movement was successful in mounting a rebellion against the unjust and discriminatory politics of the state, and they demand an emancipatory re-articulation of policies related to food, housing, healthcare, education, democracy, justice, and peace (Hamilton, Caitlin. "Brief Historical Background to the Zapatista Movement." *Hemispheric Institute of Performance and Politics*. 2025)

[15] A comprehensive worldview.

universalized belief in Western colonial modernity towards pluriversal and relational ways of being.

My focus in this thesis is specifically on the binary established in Western science fictional narratives between scientific knowledge and local wisdom. As highlighted in detail in the literature review, the genre of SF shares an affinity with the imperialist ideology, which discredits non-European traditional modes of living as antithetical to progress and sustainability. As a result, in the early SF, a legitimacy of the Western sciences and techno-culture was established by representing indigenous cultures and knowledges as technologically inferior, consequently establishing a binary between scientific prowess and local knowledge. However, as a move away from the dichotomous worldviews, this thesis attempts to transcend the binary established between scientific knowledge and local wisdom by Western political thought by depicting how they can be used together to develop context-based livelihood practices. The selected stories help in dismantling the colonial foundation of a 'single world' propagated by the West through the characters who co-opt scientific prowess with local ecological wisdom to develop energy sufficient and sustainable habitats for people devastated by climate crisis. In this way, pluriversal and relational ways of being come to the fore; highlighting an alternative to the uni-dimensional, one-world worldview propagated in a number of Western narratives.

For instance, *Indra's Web* and *Reunion* depict a dystopian future, at the end of 21st century, where GaiaCrop, a ruthless multinational corporation that already rules parts of the world, has won the bidding war to run the subcontinent's government. There is mass-scale destruction wrought by climate change with a grotesque divide between rich and the poor. The cities are ravaged by heat waves, famines and violence.

However, Singh's narrative offers a way out of the dystopia, where Mahua, an Adivasi woman and a scientist, envisions an ecotopian habitat called Ashapur (City of Hope), located at the edge of Delhi; by coming up with an idea of zero-carbon, interconnected bastis. Her Adivasi[16] heritage and her grandmother's indigenous knowledge inspires and assists her in the process, and she reconciles her modern educational knowledge in chemical engineering with the indigenous and deep ecological roots of her Adivasi heritage.

Mahua attempts to redesign the city, and comes up with a design of zero-carbon, interconnected bastis. She questions the mechanical and urbanized framework of cityscapes; the way cities are designed where "people don't have time for anything but work? There's constant stress, people don't know each other, and don't care either" (Singh 13). Therefore, instead of isolated and mechanized city spaces; she deploys relational accounts of being in the world where there is a move away from "disconnection and isolation (as propagated by the Western capitalist discourse) to reconnection" – with fellow human beings, with the nonhuman forms of life, the stream of life (Macy 2007). For example, in many indigenous cultures, there exists a continuation instead of separation between biophysical, human, and supernatural domains; therefore underlying "ontologically vibrant relational worlds" (Escobar 102). This idea is also aligned with the principles of deep ecology which underscore the "cultivation of ecological consciousness, and the insight that everything is connected" (Devall and Sessions 7-8). Deep ecologists cite 'minority tradition' as their

[16] Adivasi literally means 'indigenous people' or 'original inhabitants' and they are a part of 'Scheduled Tribes" of India, which is an administrative term used in the Indian constitution for the purpose of specification. In the Indian caste system, they are regarded as unclean and largely face the same stereotypes experienced by Dalits. Therefore, they are socially distanced, but their origin dates back to the Hindu epics like Ramayana and Mahabharata; making them an interesting subject of study in terms of indigenous practices (Bijoy, C.R. "The Adivasis of India – A History of Discrimination, Conflict and Resistance." *Indigenous Affairs.* ResearchGate).

primary impetus; and they believe that its essence is a "self-regulating community where the authority is centralized and distributed, nor hierarchical or dominant" (19); for example Mahua's transformation of the city underlies the same assumption as she aims to offer small-scale connectivity in the city spaces via the Ashapur project.

Mahua's aim to transform the megapolis[17], which she believes is beyond the scale of human social adaptation (Singh 13); by going back to her ancestral knowledge about creating small, communal living spaces that offer connectivity; can be read as a relational and deep ecological account. For example, many studies of indigenous communities such as Stanley Diamond's analysis of the dilemma of the modern world as opposed to the intricate balance of primal societies highlights that "small-scale, local communities provide both for the vital needs of the individual, and the vital need to sustain the community of humans in nature" (Devall and Sessions 20). In the similar lines, Mahua's plan of re-thinking and re-designing the city can also be seen as inspired by deep ecological insights where she not only re-imagines, but re-creates a megapolis through a number of small, inter-connected bastis that develop microclimates and help shift the climatic pattern of the whole region in the right direction. For example, Singh's narrative rejects the idea of urban centres being the sole site of change. As Raghu says, "Positive social change always comes from the margins, but islets of resistance in the mainstream are also important" (Singh13); therefore, instead of replicating the climate models introduced by the mainstream capitalist systems where "the modeller is always on the outside, looking in" (Sinha 9), Mahua and Raghu both decide to come up with an idea of having "smaller bastis like Ashapur, maybe a thousand of them in a cluster, but connected through the Sensornet

[17] The Cambridge Dictionary defines megapolis or metropolis as an extremely large city or urban area where a lot of people live.

[suntowers as a source of solar energy system] as well as a physical network of roads and green corridors" (13). So they both worked together to design and embed sensors in the walls and windows, trees and byways. In this way, they co-opt western technology and science with indigenous knowledge(s) about nature to bring about a change in the climate of the newly formed settlements.

Moreover, the settlements described in the story *Reunion* reflect a very harmonious chemistry of indigenous practices and modern methods. As deep ecologists cite "the minority tradition" as their inspiration to comb through the cultural traditions of pre-capitalist, non-urban, pre-industrial primal peoples; seeking "a basis for philosophy, religion, cosmology, and conservation practices that can be applied to our own society" (Devall and Sessions 96); Mahua's work can be read as a complex interaction between her engineering and design knowledge with her Adivasi heritage, the history of their marginalization and their community's specific way of connecting with nature. For example, the house in which Mahua lives is "a dome, a green mound, its roof and walls almost entirely covered with the broad leaves of three different kinds of gourds" (Singh 2-3), where the boundary linw between house and garden is not clearly visible. Here, the dome-shape is important as "to reduce the impact of the storms" (3) with "thick walls of clay, straw, and recycled brick, covered with greenery" (3) representing the architecture as perfect marriage of the ancient and the new modern ways of design. Moreover, the roads are also designed in a way to follow the natural contours of the land with vegetables cascading off the walls on vines, and all over the hill (3). Singh describes the newly formed bastis as "the abstract landscape of the new science," the "new knowledge" Mahua has helped develop, and the author crowns her as the "heroine of the Great Turning, the Maha-Parivartan" (Singh 1). A number of these innovative ideas of merging the modern with the traditional ways of

designing houses and cities are also deployed in a number of contemporary designs labelled as permaculture[18] for example using traditional clay building techniques to the re-discovery of similar other indigenous practices.

Here, Australian design theorist Tony Fry's idea of "defuturing effects of modern design" can also be taken into account. He argues that unsustainable architectural design can pave the way for the conditions of structured unsustainability, which thereby reduce the possibility of envisioning sustainable futures. Therefore, in order to retrieve the future-imagining capacity of design, he offers a shift in thinking from Enlightenment to a new perspective "Sustainment," which guarantees innovative ideas to nurture "relational ways of being-in-the-world capable of countering the ontology of defuturing" (Escobar 16-17). For example, the story can be read as an attempt to counter the principle of 'defuturing.' Singh describes Mahua's attempt of rebuilding the city as an ecological revolution that would bring hope to a world devastated by the climate crisis as she describes Ashapur as a beautiful "marriage of ancient and modern" (16), with its buildings "rounded, thick-walled, made from mud, straw, and rice husk" (16). Likewise, she also gives attention to the well-defined contours of the roads of Ashapur where inner ones are reserved for people and bicycles, and the outer ones are for the movement of buses and connection with the city. Moreover, she also describes the interplay and harmony of nature with people as there is "room for groves of jamun and neem trees, for gardens on the building walls and roofs" (16), portraying Ashapur as an ecologically diverse habitat. Furthermore, the societies in Ashapur are small, communal, and self-reliant where "each domicile

[18] The Cambridge Dictionary defines permaculture as system of agriculture or growing crops etc. which causes a little damage and exploitation of the land and environment, and as a result can be continued for a longer period of time.

held families related by blood and by choice, up to fifty people under one roof, cooking together in large common kitchens" (16). This depiction of the small-scale bastis is rightfully inspired by deep ecological thought, and its basic insight i.e. intermingling and inter-relatedness; of both living things and non-living things, of ecosystems and environments (Devall and Sessions 48), therefore, offering sustainable and ecological futuring practices.

Similarly, in *Indra's Web*, Mahua develops an energy grid Suryanet to counter the problem of energy crisis in the newly formed bastis by observing the "fungal network, a myconet, a secret connection between the plants of the forest" (Singh 124). She believes that there is a complex and intricate fungal network or myconet (a secret connection) between the plants [acacia, shisham, and the gulmohar] of the forest (124) which indicates that they communicate and talk to each other in a "chemical tongue" (124). She further explains that this communication is possible through "the flow of biomolecules via fungal hyphae" (124) as large, old trees are believed to share nutrients with the small saplings of the same species. By taking inspiration from this, Mahua and her team endeavour to trace this chemical language of plants. They plant sensors in the soil to catch some of the chemical exchanges between plants. The signals are fed back into the interpreter and then analysed (124-125). Taking cue from this fungal network in the forest, Mahua develops an energy grid called "Sensornet" or "Suryanet."

Taking inspiration from the fungal network and its expansive distribution in the forest ecosystem, Mahua develops an energy grid for Ashapur called Sensorset and implants suntowers to absorb as much sunlight as they can. Singh offers a charming interplay of techno-science and local lifestyle for example suntowers have been

implanted above the beautiful and natural vista to absorb as much sunlight as they can; which will later be used by Suryanet, the energy grid, to produce the required energy for the use of the residents. The tops of the suntowers are "capped by sun tracking petals of biomimetic material containing tiny, environmentally benign artificial cells, the suryons that drank up photons" (126). The structure of the energy grid is also represented as having a very playful chemistry of indigenous practices and modern technology. For example, "the Energy Central, the building below Suntower 1" had a very cool and pleasant atmosphere because "the thick mud-based walls ensured that" (127). The beautiful contrast of "The Energy Central" and "thick mud-based walls" implies the idea that scientific methods and indigenous knowledge(s) are being used together for community's benefit.

The story shows a beautiful enmeshment of relational, pluriversal, and deep ecological approaches to sustainable living and solution-based research. For example, Singh paints the fictional city of Ashapur as deeply ecological yet technologically advanced as an "uneven carpet of green and silver- roof top gardens broken by the gleam of solar panels, and corridors of native trees, neem, khejri, gulmohar, running down the hills from her forest like green arteries through the settlement" (10). Similarly, the roads across Ashapur followed a technically enhanced version of the age-old slum pattern. "The narrow roads were not built on a rectangular pattern but instead were curving, moving obligingly around an ancient peepul tree or dwelling" (126). This pattern of roads moving along trees not only allowed room for people to gather over discussions but also provided shade for wandering animals, like cows and dogs, to rest. The city roads simultaneously sanctioned space for technological advancements in the form of internet cafes and agricultural research centres (126). These descriptions support relational and pluriversal ways of living, and debunk the

idea of dominance and hierarchies propagated by the Western cultures i.e. masculine/feminine, West/non-West, human/non-human and others. On the other hand, it serves to cultivate "a non-dominant, deep ecological consciousness which allows us to see through the dominant erroneous and dangerous illusions" (Devall and Sessions 66); the binaries and dichotomies. Singh's narrative serves to articulate the idea of an indigenous, egalitarian and distributive city (where the architecture is dependent on local knowledge about land and regional climate); previously which had been washed away by the anthropogenic nature of colonial modernity. These stories tend to explore the futuristic potential of indigenous epistemological systems and destabilizes the binary of modern Western sciences and traditional knowledge(s).

For instance, Singh's narrative also energizes deep ecology's notion of ecological equilibrium, which encompasses a harmonic balance of human and non-human nature (Otto 58–59), just like the indigenized architecture of Ashapur had:

> large, coarse, fewer pathways for cars; smaller, more dense ones for people. And for other animals as well as people, the green corridors that branched into the city, maintaining biodiversity and the psychological benefits of closeness to nature, while providing Ashapur with cooler summers, seasonal supplies of fruit and nuts, and raw material for a new cottage industry in crafts (Singh 10–11).

Singh also shows that the hutments of cardboard and tin had been replaced by houses built mostly by the residents themselves with traditional materials: "a hard mixture of mud, straw, rice husk, surfaced with a lime-based plaster in use for thousands of years, then forgotten" (Singh 125-126), and the material is believed to survive almost a decade of baking heat and monsoon rains (125-126). This also points out to Escobar's

pluriversal world attuned with the relational ways of being in the world for example the use of indigenous and sustainable material, and their role as "dwelling topographies" (Escobar 38) which hints towards the deep affinity to the specifity of place and attention to "communal logics and interrelations with the environment" (38). For instance, the use of local and indigenous material points out to the fact that ecological design must involve a careful combination of human and natural systems and processes, and "reinventing technology in order to deal with contemporary situations" (Escobar 44), which is precisely what Mahua aims to achieve through the Ashapur project.

Similarly, in *Entanglement*, Singh also shows a beautiful interplay of scientific technologies and local ecological wisdom to develop context-based approaches in order to tackle climate change. For example, one of the stories in the novella is about Fernanda, a researcher, who travels to the Amazon forest for a research project. Fernanda's mission is to explore a small city in the midst of the Amazon forest known as Manaus. The story shows Amazon in a very severe draught, and the people of the city are completely oblivious of the "dire warnings the biosphere was giving them" as the "humans swelter in their concrete and wooden coops" (Singh 485). As she laments the loss of such a diverse ecosystem on the entire planet, Fernanda also foresees the consequences of "human foolishness" that has caused a drought in the Amazon; "the green lung of Earth had lung cancer" (489). The heat wave continued without respite. Deeply moved by the decaying conditions of her city and the forest, Fernanda sets out on a mission to repair the damaged ecosystem of the rainforest through an experiment that requires her to merge traditional and local knowledge of the habitat with modern scientific equipment.

However, she is aware of the magnanimity of the task ahead as she knows that it is practically impossible to recreate the natural biodiversity that happened over the course of thousands of years. Therefore, she comes to the conclusion that the only way through this project of rehabilitating the rainforest can be partially successful is to involve the local communities in it. As a result, she and her research team propose green-roofing as an experiment, and their aim is to persuade enough people and institutions to install green roofs (Sigh 486) on their homes. Their design of green-roofing involved choosing "native plants, chosen for their high rates of evapotranspiration, mimicking the radiative properties of the rain forest canopies" (487). They do so by utilizing the indigenous ecological wisdom that has been circulating for the thousands of years about the cultural and historical specifity and utility of indigenous herbs and plants. However, by combining it with proper scientific equipment in order to make green roofs gives it a modern and technological taste, enhancing its application. They initiate the project with a green rooftop garden as they plant small trees in pots and shrubs in raised beds, with an "exuberance of native creepers that cascaded lushly over the walls" (487). It was inspired from the same model that the restoration team has used in the portions of the Atlantica forest where they have planted "organically grown native forest species with room for small vegetable gardens and cacao, rubber, and papaya trees, inspired by the cabruca movement: small-scale agriculture that fed families and preserved the rain forest" (487). However, Fernanda innovates the method by deploying scientific technological equipment to make the experiment more technologically advanced; but at the same time, it must be rooted in local ecological knowledge of native plants and ecosystems. For example, they installed "a misting sprayer, and a concealed array of instruments on poles which recorded temperature, humidity, and radiative data" (487). In this way,

they make use of both traditional ecological knowledge and scientific methods. As a result, her first experimental endeavour of green-roofing has turned out to be a success, and "suddenly everyone was talking about green-roofs" (491). She then persuaded everyone to go ahead and plant roof-top gardens which will get down their air-conditioning bills because they will not be needing air-conditioners to cool down their rooms; that work will be done by the roof-top gardens.

This context based approach is aligned with the idea which Escobar remarks as "solutions grow from place" as he argues that fostering "design intelligence" is a useful strategy in order to materialize localized and solution-oriented approaches to design and architecture. The integration of "ecology and locality" (45) has been proven fruitful historically as well for example in the practices associated with bioregionalism.[19] However, it can also be enacted in design and architecture; whereby people are able to personalize and re-localize the practices that are best suited to their local context (45), and make it more efficient by integrating it with modern technologies. Therefore, Mahua's successful invention of energy grid and eco-bastis in the City of Hope Ashapur and Fernanda's green-roofing experiment with the help of using natural and local wisdom combined with scientific technologies rejects the One-World World (oww) view propagated by Euro-American metaphysics which serves to diminish embodied realities and multiple ways of being in the world. Due to architectural design's "instrumentalization and aestheticization, without deep roots in our existential experience" (Escobar 97), there is a growing disconnect between design

[19] Doug Aberley in "Interpreting bioregionalism: A story from many voices" interprets bioregionalism as body of knowledge, thought, and praxis which aims at reconnecting socially-just human cultures in a sustainable way to the region-scale-ecosystems in which they are embedded; thereby advocating a socially, culturally, and politically contextualized praxis for developing local and sustainable communities (Aberley, Doug. "Interpreting bioregionalism: A story from many voices." *Bioregionalism*. Edited by Michael Vincent McGinnis. Routledge. 1999).

and the context. However, by analysing how specific context-based solutions to climate change can be explored by taking into account the multiple dynamics of different communities, one can come up with the idea of alternative realities and alternative possibilities as the stories contrast with our growing inability to imagine alternative worlds.

Escobar defines building as a 'tectonic language' because we interact with it actively with our entire body and senses. He deploys it more in the sense of a verb than a noun (to inhabit, to dwell), "every meaningful building is at the same time about the world, about life, and about the very discipline of architecture" (98), which is clearly representative in the context-based, locally suited design experiments mentioned above. Through the imagination of alternative ways of being by combining local and the modern, Singh's stories are a compelling tale of what modern design can do to battle the effects of climate change as Singh exclaims in *Reunion* how she loves "this marriage of the traditional and the new, the forest and the city, this great experiment, this marvel that is Ashapur, City of Hope" (Singh 13); thus foregrounding the resilience of local and embodied practices and their integration with modern technology.

3.2 Multispecies Connectivity and Context-based Practices

Like *Reunion* and *Indra's Web*, Singh's selected novellas *Entanglement* and *Requiem* are also concerned primarily with scientific accuracy or technological extrapolation. However, they are more inclined towards the "provisionality of scientific knowledge" (Kurtz 534), which implies that scientific knowledge is an important form of contemporary world-making, but it is just one of the ways of being in the world. It is culturally, socially, and historically embedded in the embodied realities of specific

communities, hinting at the ways in which "our cultures, natural environments, and scientific explanations are deeply intertwined" (Kurtz 534). Therefore, Singh perfectly blends scientific technological prowess and ecological embeddedness of local communities in the stories; as the characters find a way out of the crises by interweaving scientific knowledge with local wisdom to develop locally induced methods to grapple climate change.

Both the narratives examine the collision of sustainable and traditional ways of living with that of modern scientific technology. By placing her tale among the indigenous community of Inupiat and Inuit in the North Arctic region, Singh explores the complex web of relationships, collaborative reciprocity, and intimacy the indigenous people share with cetaceans like beluga and bowhead whales. Set in the fictional near future where an organization called GaiaCorp has taken over the political power all over the world, Singh explores the impact of climate change on the ordinary, day-to-day life activities of the indigenous communities of the North people.

The indigenous communities of North Pole like Inuit in *Entanglement* and Inupiat[20] in *Requiem* have strong inter-species connection and intimacy with belugas and bowhead whales. They are considered sacred organisms in the native cultures. Bowheads are believed to be the oldest-living animals in the world; they live for over two hundred years (Singh 228). Therefore, the stories narrate how some of the local scientists attempt to save this sacred species from becoming extinct; as it is believed that they have changed their migration routes and habitats due to the increased

[20] Inuit and Inupiat refer to the communities of indigenous people living in the Arctic and subarctic regions of North America i.e. Alaska, Canada, and Greenland. They are known to have a deep connection with connection with the land and Arctic environment; and are deeply embedded in their indigenous cultures and ways of life.

contamination of marine waters as a result of climate change. The local characters' and their communities' personal connection with the beluga whales inspires the protagonists of both stories i.e. Irene in *Entanglement* and Rima in *Requiem* to come up with locally suited methods to try and save the endangered species.

For example, in *Entanglement,* Irene and her team develop a system of brollies, in the form of a family unit, to tackle the problem of melting permafrost which catalyses the release of methane gas, therefore effects the marine organisms especially beluga whales. However, her mechanism to develop the system of brolly is heavily inspired by her Inuit community's relational and deep ecological practices especially in relation to the beluga whales. The story, therefore, implies that native knowledge about multispecies existence and connectivity can be used together with scientific methods to develop situation-specific livelihood approaches.

Singh's poignant narrative provides the readers the historical undertones and embodied experiences of Irene in the intricate web of traditional ways of Inuit communities and their connection with the natural and non-human world. For instance, as she sets her shore on the Arctic after more than fifteen years being away from home, "a sudden memory came to her: going out into the ocean north of Baffin Island with her grandfather in his boat. He was teaching her to use traditional tools to fish in an icy inlet" (Singh 472). She was very small back then, and while they were on the way back to home, they saw a pod of beluga whales surfacing near their boat. They gathered around the boat, "popping their heads out of the water, looking at the humans with curious, intelligent eyes" (473). When one large female came close to the boat, her grandfather said gently, "Qilalugaq," as though in greeting (Qilalugaq is an Inuit word literally translated to "beluga whale"). The Inuit, her grandfather told her, would

not exist without the belugas, the caribou, and the seals (473). Her grandfather speaking to the beluga whale in their local tongue shows how familiar indigenous people of the Arctic are with the whales, implying that they treat the non-human beings as living and breathing entities, capable of making connections.

Similarly, ecological consciousness about the inter-species bonding and harmony can also be explained via the example of the sacredness bowhead whale is attributed with in traditional Inupiat culture, as explained vividly in *Requiem*. It is also a staple part of their local diet because "in the dead of winter, in a place still mostly accessible by small aircraft, the sole source of fresh food is meat," (Singh 248) and this is the reason the whale is considered sacred, "it is never sold, only shared" (248). Further reinforcing the connection of local people with their environment, Singh represents through her characters how whales and even ice is an inherent and significant part of local Eskimo[21] identity. For example, Vincent, a native scientist explains that "it means a lot to us, the whale, it's a part of Eskimo identity, a sacred beast that makes us who we are" (258), therefore "at each harvest [they] thank the whale for its sacrifice. Its meat is never sold, only shared" (258). Moreover, he also tells Varsha how his grandfather wanted him to learn to hunt seal and polar bear and whale according to their local traditions, but before he could grow up, the biodiversity of the region had long gone as the bowheads and other species were moving away from their ancient habitats. Their migration was largely a result of melting ice, as it has become so thin that it was not safe to walk on it. He also tells Varsha that when the multi-year ice melted, "[his] uncle wept" (259) who was an indigenous whale

[21] The term Eskimo has been used historically to refer to the native people of the Arctic region, but is now fading gradually, and is replaced by a more commonly used term Inuit.

hunter, indicating the amount of sacredness and homeliness they associate not only with whales but also ice.

This example also suggests the interconnectivity and relationship native people have with the environment and they treat it as if it is a living, breathing entity, the part and parcel of their livelihood and well-being. Their connection with the environment is so deep seated and intimate that Vincent tells Varsha that "when the ice goes, so does the way of our people" (Singh 259), hinting at the common misconception where people assume that if the cold and ice evaporate, they would be happy. However, it is not the case for them as he exclaims "we are who we are because of the ice" (259); implying the inborn, innate, and deep connection of the indigenous people with their environment. Moreover, this narrative also offers to make sense of the interconnectivity and enmeshment of human activity and existence with the environment. As whales constitute the significant feature of Arctic life, the change in their migration patterns due to the melting of ice implies less whale hunts (259), and therefore less sources of livelihood for the native people. These changes in the native ecological system depict a much deeper change; loss of a whole belief system, way of living and knowledge system.

Partly, this relationship of indigenous people with the non-human components of their environment also provides a deep ecological undertone which inspires a mechanism to inculcate balance and cooperation between individuals, communities, and the environment they inhabit. Deep ecology defines it as a "playful intercourse with the rhythms of our bodies, the rhythms of flowing water, changes in the weather and seasons, and the overall processes of life on Earth" (Devall and Sessions 7-8). The Inuit's and Inupiat's intimate relationship with non-humans and environment can be

called a “play intercourse” (65) which results from a “more sensitive openness to ourselves and nonhuman life around us” (65). Deep ecology is a shift away from the “limited and shallow approach to environmental problems” (65), and endeavours to articulate a more profound and philosophical worldview which comprises ecological consciousness, indicating a more personal and profound connection with the environment and nonhuman life. This theory of being interconnected and intermingled with nature also serves as a road to decipher the ecological consciousness which is in sharp contrast with the dominant worldview of “technocratic-industrial societies which regards humans as isolated and fundamentally separate from the rest of nature, as superior to, and in charge of, the rest of creation” (65), which is in-fact not true because every human and non-human life, the environment, and everything that exists in the universe in enmeshed.

This profundity of ecological consciousness and interconnectivity can be observed in *Requiem* where Singh manages to give a very pressing message that we cannot solve every complex problem with only machines. For instance, the way “GaiaCorp has invested so much in its intelligent geoengineering systems” (Singh 255) but it is not possible for AI robots and other robotic devices to make sense of the profound connection indigenous people share with the whales. As Rima, of the characters in Singh’s story, offers a very articulate explanation that we cannot think of Earth like a machine or engine which can be fixed by “putting living creatures into rigid categories of structure and behaviour, motivated by simplistic evolutionary imperatives” (Singh 245). On the other hand, the indigenous association to whale is not something one can understand while doing a PhD in a university, because it demands living and “traveling with the whale through its great migrations around the North Pole, being part of its way of being” (56) without any preconceived biases and

notions; implying a sense of insight and knowledge which deep ecology tends to give: living with and understanding the environment by making a personal association.

Therefore, in order to help the native people to battle with the aftermath of climate change, Singh's narratives represent a number of ways in which the local scientists develop several technological equipment inspired by the local people's connection with the environment; thereby proving relational and pluriversal approach to problem solving. For example, the story *Requiem* revolves around a young Indian girl called Varsha who sets out to explore the North pole after her aunt Rima goes missing while she was on a scientific expedition in the Arctic. Varsha learns that her aunt Rima's mission was to develop several technological equipment inspired by bio-mimicry[22], in order to assist the local communities in their struggle against climate change; by keeping in mind their close relations with the environment. Rima and her research plan to do it by merging the local knowledge(s) of indigenous communities about inter-species harmony, interconnectedness of all life-forms on Earth, and ecological sustainability that they have been using over millennia. In this way, this story also dismantles the uni-directional approach propagated by the Western futurist science fictional narratives that regard science and technology as the sole drivers to combat climate change.

Considering the importance of whales in their local community, Rima and her research team aim to decode the language of whales which they use to communicate with their own cohorts and other species, in order to decipher their migration patterns, as whales are believed to have "a sophisticated and complex communication system"

[22] The science of emulating designs or frameworks found in living organisms to make materials, machines, tools, instruments, and other devices for their application in engineering, medicine, architecture, and technology.

(Singh 245). To observe this, they plant an underwater robot in the ocean with a hydrophone. As it moves with the wales in the ocean, a visual representation of the conversations (complex sounds of whales) can be seen on the screen of the laptop (Singh 228). However, in addition to the spectral analysis which is used as a language-recognition software, the scientists also make use the natural pattern-recognition device i.e. the brain. Jimmy, a research team member, explains to his cohort that the local people have always used their brain and common sense in order to pay attention to their environment, sometimes making "the most observant scientists among us seem oblivious, blind, bumbling" (Singh 229) in front of them. This anecdote hints at the environmental consciousness and interconnectedness the indigenous people have celebrated over the years with their environment. For instance, at another point, Jimmy tells Rima that "the tundra is not silent. Did you know, ice can speak? It squeaks and grunts, makes little slithering, sliding noises, and great explosive, cracking sounds too" (229), and when Rima asks him how did he know, he proclaims through "paying attention" (230) which he had learned from his father and grandfather. He had developed a sixth sense through experience while he used to go to hunting with them which manifests itself in the form of "sensitivity to the slightest change in wind direction, the tiniest syllable spoken by the ice" (230), hinting at their ability to speak with the physical environment.

This idea also attempts to highlight the importance of feeling and connecting with the environment, which deep ecology also advocates as going beyond the "factual level to the level of self and earth wisdom; a post-anthropocentric "biospherical egalitarianism" to create "an awareness of the equal right (of all things) to live and blossom" (Naess 100). Deep ecologists aim to work out "an eco-sophical approach" (100), a philosophy which foregrounds "ecological harmony or equilibrium; a kind of

sofia wisdom" (100) which not only includes scientific precision but wisdom and awareness. The foundation of deep ecology gives rise to "ecological consciousness" (Devall and Sessions 100) about environment and non-human lives which is embedded in the socio-cultural beliefs and matrix of the society.

Consequently, the insight from Singh's narrative about the indigenous Inupiat people gives us a clear picture of the way native people communicate with the environment and non-humans since time immemorial by paying attention to the slightest rhythms and movements. So Rima and Jimmy's method of spectral and video analysis with the help of a robot, in order to communicate with and trace the whales' path, shows that their method is highly inspired, and built upon the native knowledge of Inupiat people. In this way, Singh also puts a strong emphasis on acknowledging the complexity and diversity of indigenous cultures; and underscores the importance of paying attention to the indigenous ways of existence because of their ability to live with the non-humans without destroying it. Therefore, it requires an ability to "think and live complexly" (Singh's Interview by Baishya 11) as we are a part of a complex network of interconnected relationships with multiple species and the land itself. Singh narrative offers a beautiful interplay of multispecies harmony and connectivity, and how it can be co-opted with modern scientific technologies for a solution oriented research.

Similarly, in *Entanglement*, Irene's scientific experiment of developing a brolly to save the marine organisms can be read as a part of her having being deeply inspired and moved by her community's intimate connection with the beluga whales. She grew up in the traditional Inuit household and this ideology may had been inculcated in her mind unconsciously that all the species living on the Earth are a part

of a large, interconnected web of life; where one human activity or a natural disaster has the power to influence or inspire a number of reactions, whether chemical, physical, psychological, economic, or social. As Tim Ingold, an anthropologist, states that the world is anything but static inanimate, inert container. It is rather a meshwork made up of interwoven threads or lines, always in movement. As much as any other living being, humans are immersed in this meshwork" (68). So he arrives at the idea of a sentient universe, which most of the indigenous people all over the world believe in, before Western science made us believe otherwise.

For example, Irene reminisces about the small house in Iqaluit where she grew up with her family. Her grandfather had been an immensely practical man, but he had also taught her to pay attention to intangible things, things you are unable to number like the love you could feel for a person, or the land, or the whale (Singh 481). She also reminisces herself when she was a small child as she watched her mother "weaving a pattern on the community loom: the sound, the rhythm, the colors, her mother's hands" (482) indicating that the world she inhabits is weaving itself into being through "complex, dynamic webs of interaction" (482). Therefore, Irene's experimental knowledge largely draws upon her native knowledge and indigenous Inuit roots which sees the world as a part of a large web of interaction where different human and non-human agencies cooperate and intermingle.

For example, inventing scientific equipment mimicking or inspired by local cultural phenomenon is a kind of relational and non-dualist thinking, which defies the Western binary and hierarchical approach that always sees science as antithetical to indigenous knowledge(s). Irene and her research team's most important contribution

to tackle the issue of melting permafrost[23] is the construction of a brolly which is "a human-built machine intelligence; small, cylindrical body, with its flanges and long snout, which looks like a fish on an alien planet" (Singh 474). Its function is to inject "a rich goo of nutrients (which is also her very own recipe) for methane-eating bacteria in the deep waters" (474). Methane is a much more potent greenhouse gas than CO2 as it excites a "positive feedback loop" where more methane leads to more warming and therefore more thawing of permafrost (475). However, methanotrophs (methane-eating bacteria) are incredibly efficient at metabolizing methane. However, like most living beings, methanotrophs also cannot exist in isolation, but in assemblages (474-475). As brollies provide them the required nutrients, their communities of cooperative organisms help in minimizing the release of methane.

However, the important point to note here is that the brollies are devised as "learning intelligences, intimately connected to their environment and to one another" (Singh 479); by observing the surrounding environment, they get an idea when to eject the methanotroph consortia their extra nutrients, and when to stop. Her idea of linking artificial intelligence with information feedback loops is inspired by natural systems like ecosystems and endocrine systems (479) depicting how biomimicry can be used as a potent tool to come up with a context-oriented approach. However, the important thing to note here is that the conclusion which modern scientists have drawn after years of battling with climate change is the idea that everything is connected in this intricate web of life has been known by indigenous people for centuries (480). Therefore, if used together, modern science and indigenous knowledge can allow us

[23] Permafrost refers to the permanently frozen layer that rests below the surface of the Earth. It is usually seen in the areas where the temperature rarely rises above the freezing point. However, due the rapid increase in the temperature of the Earth as a result of climate change, scientists have shared a warning that permafrost is rapidly thawing, causing the water levels to rise in the oceans and other consequences.

to develop more nuanced approaches to tackle the problems arising as a result of climate change.

Consequently, in order to reorient the rationalistic tradition and to foster embodied, situated forms of reflection, we must imagine "non-dualist forms of rationality" (Escobar 99) that allow us to reimagine human life with respect to ecological understanding, thereby arriving at "decolonial and genuinely intercultural modes of knowledge production" (99). For example, the methods of the principal characters in the stories such as Rima and Irene also show a non-hierarchical approach which delineate that the sustainability of environment is proportional to the health of larger ecosphere. Therefore, by fostering deep ecological consciousness and by enacting and following a worldview that goes beyond the hierarchical dualisms, we can come up with a holistic approach to world-making.

Moreover, these non-hierarchical and context-based approaches such as Irene's invention of a brolly and Rima's instruments inspired by biomimicry ultimately support the idea propounded by Dhruv Raina that by establishing "a dialogue initiated between traditional knowledge and modern science (by Indian cultural amphibians), the import of modern science as a cultural form was neutralised, and in the process scientific activity was legitimised as morally worthwhile and economically beneficial" (6). The result of mixing the native and the modern is a beautiful intermingling where context-based and situation-specific methods are applied to tackle the struggles brought in by climate change.

Chapter 4. Imagining Alternative Futures: Inclusivity, Ecological Sustainability, and Community Building

In the previous, I have delineated the ways through which scientific technologies and local ecological wisdom can be interweaved together to envision context-based and situation-specific livelihood practices. In this chapter, I address my second research question in which I delineate the framework and mechanism through which a relational and pluriversal approach [as outlined in the previous chapter] can help imagine sustainable and inclusive futures in the selected narratives. I expand my argument to establish that the futures envisioned by South Asian writers such as Singh, where the characters blend indigenous ways of living with modern scientific knowledge and technologies, are inclusive and participatory as the local characters develop new infrastructures for ecological sustainability, collaboration, sharing, and community building by leveraging technology for the benefit on a larger scale. Instead of a single and universal future depicted in most of the Western science fiction narratives, the futures depicted in the selected narratives are complex and multifarious. I draw upon Chattopadhyay's idea of CoFutures, which points out that futures emerging from the rest of the world (apart from the Euro-American center) are complex, relational, lived, and embodied as they develop from marginalized and multiple worldviews. Hence, they are not exclusionary but are participatory and, therefore, can help envision ecological sustainability in a relational pluriverse.

Situating my argument in Singh's selected texts *Reunion, Indra's Web, Requiem, and Entanglement,* I analyse how she envisions relational, pluriversal, and sustainable futures for the local communities that draw upon their histories and cultures without necessarily centering the Western gaze (Kamal 19). For example, the

futures envisioned in the selected texts can be read as inclusive and relational as they do not rest upon the science vs. local knowledge dichotomy in most Western science fictional works. Instead, they focus on participation, relationality, ecological sustainability, and communal bonding. The futures also suggest a more just and relational relationship with the non-human world as the characters draw inspiration from socially and culturally embedded practices. These futures are developed from marginalized worldviews and, therefore, reject the notion of a single, universal future for all humanity found in most techno-scientific Western science fiction. In this chapter, I tweak the idea of CoFutures in three ways: a) inclusivity of marginalized communities and non-humans in the imagination of future(s); b) communal bonding via leveraging technology for community's benefit; and c) ecological sustainability in the relational pluriverse.

4.1 Inclusivity, Ecological Sustainability, and Community Building via CoFutures

Most science fiction narratives emerging from the Euro-American *fantastika* are concerned with depicting a monolithic future for all humankind, where differences in temporality, spatiality, and sociocultural dynamics are ignored. Relegating the multiple and varied aspects of non-white cultures and their participation in the imagination of the future into the periphery, the discourses emerging from the White science fiction imagination are more specifically concerned about "protecting the future of *whiteness" (*Mitchel and Chaudhry 310; original italics). However, over the last few years, the futures emerging from the rest of the world have offered the spaces to envision more plural worlds that do not re-center the white-washed versions of the apocalypse. They tend to embody diverse and transformative concepts "beyond the universal notions about humanity, nature, and planet" (310). In this chapter, I

dismantle the Euro-centric notion of a single future for all humanity and tweak the concept of CoFutures put forth by Chattopadhyay to foreground plural and inclusive futures emerging from non-white imaginaries. I argue that these CoFutures offer inclusivity in place of exclusion, participation and community building in place of isolation, and ecological sustainability in place of apocalypse and hopelessness. I relate the idea of CoFutures with Escobar's idea of pluriverse to establish that future imaginaries coming from the non-white narratives offer us a way to look beyond the notion of a single, universal, techno-scientific future for all humanity, which thereby helps in establishing a pluriverse where multifarious and alternate ways of life can co-exist together.

In his book *The Routledge Companion to CoFuturisms*, Chattopadhyay explicates that the common aspect all CoFuturisms emerging from different parts of the world share is the "offering of a vision beyond the white supremacist future that permeates our collective Global North visions of the future" (1); which tends to limit or homogenize the notion of a future. CoFutures, however, uses science fictional thinking to build just and inclusive futures, offering hope for escaping humankind from the "ominous future prospects we are confronting as a human species" (Chattopadhyay 1). Moreover, as these fictional narratives are centered on marginalized communities for whom "the dystopia is an everyday reality" (1), the futures they imagine through science fictional thinking do not involve cyclicality; instead, they offer visions of alternative futures. Consequently, these futurisms tend to find antidotes to dystopia by depicting culturally embedded histories and embodied realities of the people. In this way, these futures enable the characters to make bonds of solidarity amidst crises and to "find meaning in survival within cultures of protest and resistance" (1). The CoFutures offer us hope and a way out of the dystopia,

implying that their critical negotiation offers multifarious and varied versions of futures beyond the singular white vision of the future.

For instance, firstly, the future(s) envisioned in Singh's selected texts do not rest upon the anthropocentric distinction between humans and non-humans. InsteadThey offers multispecies connectivity by depicting non-human actors as active participants in the saga of human life. Moreover, these futures are developed from marginalized worldviews where marginalized groups come together to not only resist but change the dominant political order, and develop scientifically oriented but ecologically and culturally embedded livelihood practices. In this way, these futures enable us to reorient the rationalistic tradition from Cartesian[24] dominance to fostering inclusivity; imagining non-dualist, embodied and situated forms of life in order to "resituate humans with an ecological understanding of life, and thereby arriving at a decolonial and intercultural modes of living" (Escobar 99). Therefore, these futures can be termed inclusive, as the futures that Singh imagines in the selected texts are about understanding human relationships with one another, with marginalized people, and with a marginalized non-human world.

For example, we have seen in the previous chapter that in *Reunion* and *Indra's Web*, to enable local communities to adapt to the changed climatic conditions, Mahua introduces new models for architecture, energy conservation, and urban infrastructure in the form of the Ashapur project, i.e., the development of an open data infrastructure for a connected city called "Sensornet" and the establishment of "eco-bastis." The

[24] Propagated in the philosophy of a French philosopher Rene Descartes (1596-1650), the Cartesian system is a species of rationalism which holds that knowledge can be derived from reason via innate ideas, and it adopts an ontological dualism of two finite substances (mind and matter); giving rise to the concept of binary opposites.

"embedded intelligence agents" she develops are founded upon her "desire to be companionably present with the non-human and the inanimate" (Singh). Her open data infrastructure is not about the efficient transfer of goods and capital but of a “sensitive relation to the more-than-human ecologies” (Singh 352-354). Therefore, it can be argued that her project is about cultivating a relationship with technology that serves communities of humans and non-humans alike instead of only serving the capital.

As a result, Mahua devotes considerable attention to the organization of the settlements in Ashapur that are well-suited for both humans and non-humans: "inner roads for people and bicycles, the outer ones for buses that connect them to the greater city. There was room for groves of jamun and neem trees, for gardens on the building walls and roofs” (Singh 358). Instead of creating an anthropocentric model of a city that caters to the needs of human beings only, Mahua is interested in developing ways for people to sense the information flows around them—between matter and matter, inanimate and otherwise. Eventually, she succeeds in developing embedded intelligence agents in the inanimate world, creating “a modern, sensate city” (Singh 6). This interconnectivity between the human and non-human world implies that creating better futures must be a mindful, active practice, implying a kind of adaptive relationality that ensures that by making connections with each other and other entities, people can also change and grow along with them, fostering nonhuman and environmental consciousness.

Moreover, non-humans serve as principal characters in Singh’s stories, inspiring Mahua in her scientific work. For example, the idea for the model of an energy grid called Suryanet developed in *Indra’s Web* has been taken from a corporal fungal network found in the forests called myconet. Mahua believes that the plants in

the forest communicate through a chemical tongue; therefore, she sets out to assess the relationship between nature and humans. At the beginning of the story, Mahua is seen running through the forest to relieve her stress regarding her grandmother's stroke and malfunctions in the Suryanet. She seeks inspiration from the forest as "forest was where she got her best ideas," and that is why "her work was getting recognition across the world" (Singh 142). In turn, the forest also treats her as one of its own; "here she [is] just another animal: breath and flow, a kite on the wing, a deer running" (142). These post-human connotations imply that humans are physically, chemically, and biologically enmeshed with the environment. It is further enforced in the story when Singh narrates that at the age of thirteen, Mahua had fallen sick and self-diagnosed herself with a malady she called 'acute apophenia' which is explained as a tendency to see patterns and connections in everything she sees around her. For this reason, Mahua could form a kinship with the environment and decipher connections between nature and humans. Ashapur is the by-product of the same instinct. She employs technology following bio-mimicry principles to create a complex web-like energy grid: Suryanet. Hence, the human and nonhuman actors of Ashapur produce change and affect each other's behaviours in different ways and to varying degrees.

Similarly, in the other two stories, *Entanglement* and *Requiem*, Singh shows the indigenous people of the Arctic have complex relationships with non-humans, especially beluga whales. By moving away from the anthropocentric approach where human beings are considered the center of the universe, Singh acknowledges the complexity and diversity of Indigenous cultures, i.e., their ability to live with non-humans without harming/destroying them. It needs an understanding to contemplate and live complexly because "we are immersed in a network of dynamic relationships

with multiple species and the land itself" (Singh quoted in Baishya 11). In both stories, whales serve as principal figures as they are considered an important part of the Arctic life. The importance of what geographer Chie Sakakibara (2020) calls 'cetaceousness[25]' can be inferred from the stories of the Indigenous communities of the North Pole, like the Inuit in *Entanglement* and Inupiat in *Requiem* consider whales as sacred species, and not only their livelihood but their belief system and existence is dependent on them. .

For example, the indigenous people are believed to have a strong inter-specie connection and intimacy with belugas and bowhead whales. They are considered a sacred specie in the native cultures, a staple part of their local diet because 'in the dead of winter, in a place still mostly accessible by small aircraft, the sole source of fresh food is meat," (Singh 248) and this is the reason the whale is considered sacred, and its meat is "never sold, only shared" (248). Moreover, the whale hunt is also considered a sacred and communal ritual in indigenous culture and once a whale is captured, people gather around it and say their prayers, instead of "trapping animals into constant, unrelieved suffering in their thousands in factory farms" (248). This intimate and sacred connection between different species shows that we are indeed "not apart, but a part" (Singh) of each other, of this beautiful, rich Earth; as we are made of all the things we eat, and live with like Varsha claims that she is "made of many things—mother's milk, fruit of guava and mango trees, rice of the Indian Gangetic Plain, vegetables of splendid variety, meat of many creatures, and now—

[25] Chie Sakakibara coined the term 'cetaceousness,' a hybrid of cetaceous and consciousness which links human awareness with cetaceans or whales; referring to human-whale interactions at a number of levels. He refers to this term in the context of the emotional and social connection the Inupiat people of Alaska share with the bowhead and beluga whales for the purpose of communication (Sakakibara, Chie. "Kiavallakkikput agviq (into the whaling cycle): Cetaceousness and climate change among Inupiat of Arctic Alaska." *Annals of the Association of American Geographers*. vol. 100, no. 4. 2010).

bowhead whale!" (248). Further reinforcing local people's connection with their environment, Singh represents through her characters how whales and even ice are an inherent and significant part of local Eskimo identity. For example, Vincent, a native scientist, explains to Varsha how ice serves as a vital part of the local Eskimo identity and makes [them] who [they] are (258). Therefore, they pay gratitude to the whale for its sacrifice at every harvest. It connotes whales' cultural, religious, and symbolic significance for the native people.

Moreover, the stories depict whales as sentient beings who have a strong communication system and can communicate with other species' members. They are depicted as actors, speakers, and players who are as responsive and wise as human beings. For example, in *Requiem,* Varsha narrates the story of her trip to California to see the Californian gray whales in the ocean. As she was standing on the railing, she observed "an ancient eye" (Singh 242) looking at her, and "in that one glance, that tenuous, temporal bridge between being and being" (242), she instantly knew her life would change; she exclaims "at that moment I existed in a way I hadn't before—in the eye of a Californian gray whale" (242). She then narrates the incident to Jimmy, and he explains that as the whales have a very long life span spanning decades, they may have acquired what we term as wisdom, but we only associate it with humans. However, it is a misconception because "why should humans be the only ones with a sense of agency, a desire to make things better for themselves? We already know that whales have culture—different pods of the same species have different habits and tastes in food" (243), dismantling the anthropocentric belief that only humans have the privilege to communicate with each other. Varsha also excitedly says that "this is why I could believe the old stories as a child, in which animals are speakers and

players" (244) indicating the importance of the contribution of nonhuman actors in weaving the reality.

The story also symbolizes the indigenous belief of inter-species harmony and communication, as it is not in the "white man's way of thinking, to think that there are other species than him, who might want to talk to each other" (Singh 266). In the Indigenous stories, however, "polar bears and whales and all the other creatures talk to each other as well as to people" (266), but the white man considers it just a "kid's stuff or mythology" (266). Singh's narrative, thus, dismantles the anthropocentric binary between humans and nonhumans by shedding light on the significance of Indigenous beliefs and ways of living that not only signify the agency of non-human actors but are deeply embedded in the relationality between humans, nonhumans, and the environment.

Similarly, in *Entanglement*, Irene is saved by a whale as she goes underwater to observe the experiment they have been doing. While inside the ocean, she could feel a leak or tear in her suit, through which cold was coming in (Singh 476). His legs were cramping, and as she looked up, "the surface seemed impossibly far away, and the cold was filling her body, making her chest contract with pain" (476). She was sensing her death before her with astonishing clarity, but suddenly, she felt something lift her bodily; an enormous white shadow loomed—a whale. She could feel the solid body of the whale below her as "it was pushing her up with both balance and strength until she broke the water's surface near the boat" (477). She tumbled on the boat and collapsed on the deck, pulled off her mask, sobbing, breathing huge gulps of cold air (477). This incident provides the basis for understanding Indigenous people's

relational and reciprocal relationship with the beluga whales, where whales are seen as sentient and wise beings.

Consequently, it can be observed that in Singh's future imaginaries, human/non-human interactions, relationships, and connections are derived from Indigenous cosmology, beliefs, and embodied ways of living, thereby promising a non-dominant political ecology. This aspect of CoFutures can be further explained by the help of Dillon's theorization, which defines CoFuturisms as "narratives of biskaabiiyang[26]," which entails a returning to the self through decolonization by recovering ancestral traditions to adapt in our post-Native apocalypse world" (Dillon 10). The process involves reshaping and/or rejecting colonial beliefs and concepts, such as the divide between us vs them, human vs non-humans, etc, by employing indigenous scientific knowledge and cosmologies contradicting the dominant assumptions of many Western worldviews. Therefore, CoFutures often portray a worldview in which "human beings, animals, plants, spirits, even weather patterns possess agency and function as active characters, thereby preserving Indigenous scientific wisdom and spirituality in particular" (Dillon 3). In this way, it also gives deep ecological undertones that work by transcending the binaries between human/nonhuman, western science/non-western tradition (Devall and Sessions 65), thereby cultivating "a non-dominant ecological consciousness" (Luke 180). The ecotopias imagined by Singh "avow both the intrinsic value of non-human nature—its value apart from its utility for humans—and the importance for humans to act within,

[26] Bisakaabiiyang (returning to ourselves) is an Anishinaabeg word meaning the enactment of 'returning to ourselves' via the regeneration of Indigenous ways of knowledge. It explores the processes of decolonization through Indigenous Futurisms, ancestral and historical knowledge by challenging the colonial hangover.

not outside of, natural dictates" (Otto 48); reinforcing the holistic and egalitarian ways of living.

In addition to being inclusive to non-humans, the futures envisioned by Singh do not follow the end of the world narrative strategy found in most of the Western science fiction fantasies, where the world is 'saved' by a male, white superhero. These stories offer us a vision beyond the white, hetero-patriarchal version of the future; where local female characters bring about a constructive change. In this way, these futures not only provide hope amidst the lingering devastation, but also dismantle the Euro-centric and patriarchal vision by representing strong and powerful female protagonists. For example, all of the selected stories of Singh are led by female protagonists such as Mahua, Rima, Irene, and Fernanda. As female characters are often not involved in the imagination of futures; or if there, they are usually represented as an aide to a stronger male characters, Singh's stories as an expression of CoFutures allow us to offer support to "a diverse network of political actors, predominantly minority ones" (Chattopadhyay 8); thereby making space for many marginalized groups such as women to play their role in the imagination of futures. As a result, CoFutures are "more realistic in being grounded in different people's experiences and more extravagant in the possibilities they offer beyond the singularities of generic prisons" (13). Therefore, CoFutures are defined as being complex and coeval as they allow us the possibility of an alternate and a more hopeful, beyond the dominant consolidates of power and narratives of hopelessness, panic, and apocalypse.

In their imagination of hope, CoFutures can be termed as an extension of an "anti-anti-utopia[27]," a term used by Philip M. Crosby in his article "Towards an Anti-Antiutopia: Solarpunk Cities and the Precarity of our Urban Futures." He argues that the opposite of utopia is not dystopia as there can be a utopian impulse in dystopian narratives as well, with the help of which status quo can be criticized and dismantled. It is the concept of anti-utopia which extracts any hope of imagining alternative futures (81). As anti-utopias quench every hope of imagining alternative, sustainable, and better futures; they are a tool utilized by capitalist powers that revel in the misfortunes of fictional characters, offering no hope of resistance and redemption. Hence they become complacent with the imperial and capitalist ideologies; which propagate the belief that redemption can only come from the outside, and the local people are not equipped to bring about a transformation. However, over the last few years, a relatively new genre in SF has emerged as a response to anti-utopia called "solarpunk[28]"; which serves to embrace a rather hopeful approach, and offers promising roadmaps to envision anti-antiutopian futures (Crosby 81). Solarpunk futures offer hope, solidarity, and optimism in place of resistance (82); and the CoFutures depicted in Singh's selected stories can be analysed in terms of solarpunk futures which offer a harmonious co-existence of nature and technology.

[27] Kim Stanley Robinson in his essay "Dystopias Now" explores the concepts of utopia, dystopia, anti-utopia, and anti-anti-utopia. He argues dystopias are the "not-concept" of utopia where things get worse rather than better. Anti-utopias refer to the complete deconstruction of utopia, marking the impossibility of changing the situation for the better. However, anti-antiutopia means to be utopian which refers to the call that things can get better, but more importantly, to imagine how they might get better, which can be better understood via Romain Rolland's quote: pessimism of the intellect, optimism of the will (Reid, Alex. "anti-anti-utopian rhetoric." Profalexreid.com. 2019).

[28] Solarpunk is a sub-genre of speculative fiction/sci-fi which envisions a future depicting harmonious co-existence of nature and technology; visualizing communal and ecological utopia (ecotopia) offering sustainability and harmony.

For example, unlike the end of the world narratives depicted in most of the Western science fiction, where any hope of transformation is dismissed until a white, male superhero or a scientist comes as a saviour for all humanity; Singh's envisioned futures offer us a vision beyond West's hetero-patriarchal narratives, which not only offer hope, vision, and resistance; but show that positive social transformation can be brought about by the local female characters. Therefore, they enable us to contemplate future worlds beyond male, white-centric parameters while also dismantling the anti-utopian impulse of many Western SF narratives. For instance, in *Reunion* and *Indra's Web*, Mahua, an Adivasi woman and a scientist, envisions an Ashapur project where she comes up with an idea of zero-carbon eco-bastis and an energy grid called Sensornet to develop sustainable livelihood practices amidst the devastation caused by climate change. Similarly, in the other two stories *Requiem* and *Entanglement*, the principal characters are females i.e. Varsha, Rima, Irene, and Fernanda. Therefore, it can be argued that Singh's representation of women, particularly coming from indigenous backgrounds, has a subversive potential as it serves to debunk the normative hetero-patriarchal idea that only a white male superhero can be a saviour. These stories of women not only demonstrate the remarkable advancement of a local scientist and her indigenous and scientific technique, but also challenge the superiority of Western science fictional discourse which rests the future of all mankind in the hands of a male saviour.

Moreover, the futures envisioned in the selected stories offer us hope in a post-apocalyptic world which debunks the stereotypes often associated with indigenous cultures as them being primitive, not adept in technology; "making technologies and advanced political systems seem alien and otherworldly in their context" (Chatterjee 1997). However, the futures depicted in the selected stories reject this myth because

in spite of the devastation and apocalypse, Singh's narratives offer a way out of the dystopia. As Dillon expresses that the authors who experiment with Indigenous futurisms can create "ethnoscapes[29]" which refer to creating alternative worlds with the help of future imaginaries in which the authors are able to "foreground the intersection of race, technology and power" (24) with the help of co-opting history and mythology in the form of complex fictional narratives which may seem dystopic at first but "inevitably unfold junctures of hope" (24). As a result, these futures or CoFutures serve to decolonize the singularity of the future with respect to indigenous cultures; and the colonial foundations in SF imaginary are decolonized as "the world becomes a richer and more complex cultural space" (Chattopadyay 13). By rejecting the past/colonial frameworks of futures which draw upon racist, sexist and colonial ideologies; CoFuturisms present futures characterized by "openness and fragmentation" (13). Like solar punk futures, CoFutures serve to navigate the worlds that foreground community building rather than individual pursuits, ecological sustainability instead of environmental deterioration, and hope and optimism rather than nihilism.

For example, developed by and from marginalized worldviews, the futures presented in Singh's narratives offer ways of inclusivity, participation and community building by foregrounding the lived realities of diverse local communities. For example, in *Reunion* and *Indra's Web*, the zero-carbon, eco-bastis built by Mahua hold a symbolic value of a shared communal living setup, as the Hindi/Urdu word 'basti'

[29] Ethnoscape is a term coined by Arjun Appadurai in his essay "Disjuncture and Difference in the Global Cultural Economy" (1990) which refers to a "landscape of persons who constitute the shifting world in which we live: immigrants, tourists, refugees and other such moving groups" which hitherto affect the politics of nations to an unprecedented degree; characterizing the disjuncture of the global political economy (Chun, Allen. "Ethnoscapes." ResearchGate. 2012).

hints at a symbolic and connotative meaning. The word basti literally means dwelling, and refers to any place where people might dwell. However, symbolically, it suggests a home, a community, a living space where people live with each other concordantly; in a form of a shared brotherhood, and a shared and relational connection with non-humans as well. In the story, this sense is also re-appropriated in the new form of settlement. The original occupants of Singh's fictional basti are marginalized people – climatic refugees from Bangladesh who have been uprooted from their homelands because of the rising sea levels. In this sense, the basti is a site of "marginal resistance" (Singh 353) where different people come together to resist against the larger order (the government or the state which is not providing them relief) to form a communal and shared living space. This meaning is avidly encapsulated in the term basti, as Singh preferred it over a settlement or society. Therefore, Singh's vision of the CoFuture is about forming communal relationships; and in a way, it can serve as a critique of the way the modern urban spaces have become increasingly isolated and private. Singh's narrative, on the other hand, envisions collaborative and cooperative future where technology and social developments has been leveraged for the benefit of the community.

Chattopadhyay argues that the very nature of CoFuturisms is “interconnectedness and overlap” (1). The narratives involved in CoFutures tend to use science fictional thinking to envision a better tomorrow by rebuilding the societies in which we want to live in a more “collaborative and collective way” (2). He therefore suggests that CoFutures are complex, coeval, and most importantly, compossible. “Compossibility requires solidarity despite, and often because of, a recognition of difference” (339). It suggests that people, as a community, can work together to build a life they want for themselves by mutually recognizing the similarities, but also

respecting the differences. He suggests that CoFutures can only be realized via compossible futures based on solidarities; and science-fictional world-building based on possibility can exhibit such compossibility. Thinking in terms of compossibility or envisioning compossible futures thus requires practice (339); in this way, CoFutures can offer the spaces for community building and communal bonding instead of isolation, exclusion and individuality.

In the post-apocalyptic situation, the rebuilding and reimagining of inclusive futures requires collaboration and participation. However, this participation must not be restricted to human beings alone. It must be scattered and distributed among all life forms that exist on the planet as Escobar also reminds us in order to create a mode of living that is both relational and communal involves "equal relations among people, relations to the Earth and more-than-human world, economy, agricultural and food practices, nurturing plants and animals, and observing sustainable healing practices in design making" (173); which suggests that communal living includes a number of interdisciplinary livelihood practices from food production to architectural design and human/nonhuman connection. A number of these practices can be seen in the selected texts.

For example, the futures envisioned by Singh offer connectivity, community building and communal bonding i.e. the mechanism of developing the roads described in *Indra's Web* offers a glimpse of the communal life in Ashapur where "the narrow roads were not built on a rectangular pattern but instead curved, moving obligingly around an ancient peepul tree or dwelling" (Singh 126). This mechanism allowed room for people to congregate in front of this chai-house or in that niche, so that old women could gossip and mind the little ones, and the wandering cows and pariah dogs

had room to rest (126). This shows that unlike the mechanized and capitalist, urban cityscapes which are designed to foster competition and hyperactivity, and are also principally designed for a male body; Ashapur, with its unbiased and people-friendly mechanism of roads, interconnections and even architecture and design offers connectivity and relationality at all levels. Moreover, the optimal functioning of this newly formed city has been achieved as it offer connectivity on multiple levels for example in the form of:

> large, coarse, fewer pathways for cars; smaller, more dense ones for people. And for other animals as well as people, the green corridors that branched into the city, maintaining biodiversity and the psychological benefits of closeness to nature, while providing Ashapur with cooler summers, seasonal supplies of fruit and nuts, and raw material for a new cottage industry in crafts (Singh 127).

This connectivity between all life forms in Ashapur signifies its importance as it is considered a founding block in many indigenous cultures where there is a continuity instead of separation between what modernists categorize as "biophysical, human, and more-than-human domains which then give rise to local models offering ontologically vibrant relational worlds" (Escobar 102). In this way, it gives to a sense of locally and culturally foregrounded communal bonding.

Moreover, it can be observed that this optimal functioning of the city has been achieved not just by new technologies, but by envisioning new ways of embodied and communal living that are egalitarian, holistic, and pluriversal, where all forms of life

can proliferate. This approach reminds us of Escobar's idea of a "matriarchal design[30]" in which he envisions to extricate design from its embeddedness in modernist, patriarchal, unsustainable, defuturing practices; and redirect it towards relational, matriarchal, and ontological practices and performances. In this way, "design can become a part of a toolkit for the transition towards a pluriverse" (Escobar 16). He aims to do it by "recrafting communal forms of knowledge, being, and doing – a process of 'matriarchalization' of defending and re/creating relational and cooperative modes of living with humans and nature" (16). This enabling of communal, relational, and cooperative mode of living through design reminds us that "design against the status-quo" (Escobar 17) can act as a catalyst for collectively redefining our relationship to reality by imagining alternative ways of being (Dune and Raby 2) which fuels 'social dreaming' (169); resulting in the multiverse of worlds our world could be (160) – a pluriverse.

In this way, CoFutures is a move towards envisioning and creating ecologically sustainable futures in a pluriverse. The selected stories counter the unsustainable defuturing practices, and allow us to envision the approaches of design that offer "ontological futuring practices" (Escobar 119). According to Escobar, the futuring practices symbolize "Sustainment" which take us beyond the imaginations of colonial world-making through "re/makings that radically transforms human tendency towards

[30] Arturo Escobar in his essay "Feminism and Revolution" traces the differences between patriarchal and matriarchal cultures and states that both are different in terms of their living patterns, manners of emotioning and networks of communication, irrespective of gender. Patriarchal cultures value control, competition, hierarchies, power, domination, and violence. Conversely, matriarchal cultures are characterized by "the biology of love" highlighting inclusion, participation, co-existence, collaboration, respect and revival of life; which henceforth translates into all varieties of life such as family, relationships, design and architecture, agriculture, economic and politics etc. (Escobar, Arturo. "Feminism and Revolution: Looking Back, Looking Ahead." Great Transition Initiative: Towards a Transformative Vision and Praxis. 2018).

the unsustainable; rearticulating the relational assemblages of the biological, the sociocultural and the technical" (119). For example, in addition to community building and communal bonding, Singh's stories not only show technological stability and human/nonhuman interaction but they also reorient ecological sustainability in the pluriverse. In *Reunion* and *Indra's Web*, it is clearly mentioned that the collective governance of the newly formed bastis is substantially inspired by the Adivasi tribal people's way of governing through consensus, community, and in prioritizing "reverence for the web of life" (Singh 365). The basti, in turn, has been transformed as an ecologically sustainable community where eco-friendly practices are being observed by the inhabitants for example the building materials such as cardboard and tin have been replaced by settlements built mostly by "the residents themselves with traditional materials: a hard mixture of mud, straw, rice husk, surfaced with a lime-based plaster" (Singh 124-125). These practices have been in use for thousands of years, but have been forgotten over a period of time due to the domination of Western forms of knowledge. However, through incorporating these sustainable practices in Ashapur, it has been transformed into an ecologically sustainable settlement where "uneven carpet of green and silver —rooftop gardens broken by the gleam of solar panels, and corridors of native trees, neem, khejri, gulmohar run down the small settlements like green arteries" (125); presenting a perfect image of a communal and ecological sustainable design.

In addition to using eco-friendly and ecologically sustainable ways of living, Ashapur is nearly self-sufficient in food and energy. In Ashapur, for example, food, energy, and building materials are sourced locally, producing healthier indigenous systems. Practices like building houses by the dwellers themselves with the traditional material—"a hard mixture of mud, straw, rice husk, surfaced with a lime based

plaster" (Singh 10), which have made the city even more optimal for living. These environmentally sustainable houses in Ashapur "survived nearly ten years of baking heat and monsoon rains" (10). These indigenous practices can be viewed in terms of what Vandana Shiva, an ecologist and a feminist, explains as "postcarbon economies home" as she believes that the key transformation of the economy from 'oil to soil' (i.e. from a mechanical-industrial mode centred on globalized market to people-and-plant centred) can be possible through re-localization based on construction of decentralized, biodiversity driven organic food and energy systems operating through local economies; thereby preserving ecological integrity (Shiva 2005, 2008). These localized mechanisms are clearly visible in the selected stories that prove that local people are fully equipped to develop sustainable ecological practices for their survival.

For example, Mahua and her research team devise several mechanisms to save energy for future use; for example they install four solar plants making hydrogen from the breakdown of water through sewage-fed biogas plants. Energy is also saved with the help of building construction and layout. For example, none of the buildings need air conditioning because they have devised natural cooling processes. They have also installed solar panels on numerous rooftops for conserving solar energy. Moreover, the people are advised to live in several "micro-bastis in the form of clusters, throwing away nothing, re-using almost everything" (Singh 126). The indigenous dwellers of the bastis also made use of traditional ways for cooking through simmerpots. These pots are made of mud and straw rather like the walls of the dwellings but in different proportions—and it is another reason for low energy usage in Ashapur. These pots serve as good insulators and keep the cooking going for hours after a little simmer of two minutes on the stove. The traditional method is used for centuries by the local indigenous people, and it gets revived with Ashapur's transformation. Simmer-pots

bring down a considerable level of human energy consumption, making the city energy efficient (Singh 131). These local traditional practices can be read as what Dillon calls "Indigenous scientific literacies" (25) which refers to the techniques (from medicine and agriculture to design and farming) used by indigenous people in order to manoeuvre the natural environment to enhance the living patterns of the indigenous communities.

Singh's narratives clearly reflect on the potencies of forming local communities and bioregional autonomies where "an ecology of transformation" (Hathaway and Boff 2009) can be used as a road to minimize the aftermaths of capitalist infrastructure in order to envision sustainable communities marked by ecological justice, biological and cultural diversity, and bioregionalism (Escobar 142). Naess, the ecologist who coined the term deep ecology, also sponsors the idea of reinforcing bioregional sovereignty in the form of "local autonomy" and "decentralization" (153–4). Deep ecology, thus, encourages establishing self-governing democratic communities, harvesting local resources, and reforming local economies. This context based approach is also aligned with the idea which Escobar remarks as 'solutions grow from place' and cultivating design intelligence becomes a key aspect of democracy based on locality.

Moreover, the historical, cultural, and temporal specificity of these future imaginaries also echoes Chattopadhyay's belief that future is not an empty signal to the retro-futurist mode; rather futures are pluralized to signal a more accurate historical mode (16). These futures move the centre of production of the futurist imaginary both spatially and temporally by specifying time and history of the local context for which the future is imagined. As a result, these futures bring to the fore alternative

cosmologies and alternative ways of knowledge-making derived from local contexts and embodied histories of people. So in a way, they bring to the present coevalness (Chattopadhyay16), which according to Chattopadhyay is also a maker of CoFutures. It implies that while CoFutures create alternative ways of viewing the world, from a different angle, the process is not apart from the larger tradition of SF, but is a part of it. It only narrows down the temporal and historical specificity by infusing speculation with time and space. This is an intensely political act that recognizes that neither the past nor the future is simple. Rather it articulates that places and peoples are the product of the same time, and that origin stories as systems for maintaining hierarchies need to be discarded. In this way, a history of human futurisms, complex and coeval, replaces the history of SF (16), resulting in its proliferation and distribution to a variety of sources and paradigms.

The above discussion thus foregrounds the ways in which CoFutures serve to dismantle the single and monolithic conception of future in a variety of Western SF narratives. In contrast, the study delineates the ways in which futures are historically and culturally situated, giving rise to a more nuanced and localized version of future which is complex, embodied, relational, and pluriversal.

Chapter 5. Conclusion

I began my thesis with a critique of binary thinking or Cartesian dualisms which form the basis of the structuralist political thought in Western academic circles. My focus was specifically on the binary established in Western science fictional discourses between scientific knowledge and traditional/local wisdom. This tendency of framing things in terms of polar opposites is found in majority of the futurist science fictional narratives coming from the Global North imaginary. With its emphasis on science, it predominantly deems local knowledge as inadequate, irrational, illogical and unscientific. As a result, indigenous systems of knowledge are relegated to the periphery, and a superiority and hegemony of Western techno-scientific discourses is established. Therefore, most of the futures imagined in Western science fiction narratives envision a universal, techno-orientalist vision of the future for all humanity.

Through this research, I have rejected the notion of a single, universal future that is often projected in Western science fiction. With the help of the textual analysis of Singh's selected stories, I have shown that the futures imagined in the selected texts do not rest upon the Western epistemological foundations vis-à-vis the divide/binary established between scientific technology/local wisdom. Rather the characters in the selected stories co-opt scientific prowess with local ecological wisdom to come up with culturally and historically embedded praxis to fight climate change. As a result, the futures envisioned here do not necessarily follow the end of the world narratives propagated by Western science fiction, but are deeply interconnected with the lived and realities of the local people. By rejecting the West-centric vision of a monolithic future for all humanity, this research has attempted to offer alternative and pluriversal futures rooted in distinct cultural, historical and ecological contexts, which offer a

dialogue between scientific technological knowledge and local wisdom to come up with nuanced solutions to tackle the issue of climate change.

I have done so by tweaking the concept of CoFutures put forth by Chattopadhyay to claim that Singh has employed the genre as a means of cultural decolonization by reconciling scientific technologies and local knowledge, thus transcending the binary of scientific knowledge/local wisdom propagated by the West to imagine CoFutures which are marked by ecological sustainability, relationality, inclusivity, and community building. I have connected the idea of CoFutures with the theorization of "Pluriverse" by Escobar and "Deep Ecology" first put forth by Naess and further extended by Devall and Sessions to foreground localized forms of existence. For instance, in his theorization of a "Pluriverse," Escobar foregrounds the slogan that "another world is possible" (9); thereby offering ways to look beyond the Western forms of knowledge. Similarly, deep ecological approach is centred on developing ecological consciousness by bringing all life forms on earth in the ecological thought, and creating sustainable ecological practices. By using this framework, I have argued that indigenous knowledge about climate, ecology, and architecture can be used alongside modern technological advancements to envision futures for local communities that do not necessarily follow or re-centre the Western gaze, but can help in developing an egalitarian and holistic worldview by dismantling the hierarchical binary thought, and in turn creating avenues for a relational worldview.

In this concluding chapter, I provide an overview of my thesis and draw attention to the ways in which South Asian fiction is imagining alternative futures, as opposed to the mainstream SF. My analysis has been divided into two major sections.

In the first section titled "Beyond the Dichotomies: Transcending the Binary between Scientific Knowledge and Local Wisdom," I have attempted to answer my first research question: to delineate the ways in which characters in the selected texts blend local ecological wisdom and indigenous knowledge with scientific technologies. As a result, it enables to envision nuanced and context-based approach to tackle the issue of climate change. I have analysed Singh's selected science fictional texts that envision the futures where local characters blend traditional ecological wisdom about architectural practices and multispecies existence with modern scientific knowledge to develop sustainable approaches amidst the impending climatic and ecological changes.

Through the analysis of textual examples from the selected texts, I have explored the ways in which the selected stories help in dismantling the colonial foundation of a 'single world' propagated in the Western narratives as the characters co-opt scientific prowess with local ecological wisdom to develop energy sufficient and sustainable habitats for people devastated by climate crisis. In this way, pluriversal and relational ways of being come to the fore; highlighting an alternative to the uni-dimensional, one-world worldview propagated in a number of Western narratives. I have advocated for a relational and pluriversal world where along with Western sciences and technology, natural and indigenous ways of living are also considered important as solutions to the climate crises must arrive locally, and be suited to the local historical, cultural, and ecological context.

For example, *Reunion* and *Indra's Web* represent a perfect marriage of the local and modern ways of living in the form of Mahua's eco-bastis and energy grid, where she draws upon her Adivasi heritage and her education in chemical engineering

to develop sustainable lifestyle for local people. Both the projects draw upon the indigenous ways of living in small, self-reliant communities; and taking cue from natural phenomenon like the inherent connections between plants in a forest and the fungal network. Similarly, in *Entanglement* and *Requiem*, Singh also shows a beautiful interplay of scientific technologies and local ecological wisdom to develop context-based approaches in order to minimize the effects of climate change in the form of brollies, green-roofing, and other experimental ventures. My analysis of the selected stories has shown the relevance of indigenous ecological knowledge in tackling the problems arising as a result of climate change because it is needed for the rapid application of scientific knowledge. The application of outside knowledge requires an understanding of social context that only indigenous and local knowledge can address. Therefore, to fight the impending climate crisis, it can be established as the need of the hour to reconcile traditional practices with scientific knowledge to create a better and ecologically sustainable future. It is only through mutual reconciliation that we can envision this world to be pluriversal in the true sense.

In the second section of my analysis titled "Imagining Alternative Futures: Inclusivity, Ecological Sustainability, and Community Building," I have addressed my second research question in which I have delineated the mechanism through which a relational and pluriversal approach can help imagine sustainable and inclusive futures in the selected narratives. I have expanded my argument to establish that the futures envisioned by South Asian writers such as Singh, where the characters blend indigenous ways of living with modern scientific knowledge and technologies, are inclusive and participatory as the local characters develop new infrastructures for ecological sustainability, collaboration, sharing, and community building by leveraging technology for the benefit on a larger scale. Instead of a single and universal

future depicted in most of the Western science fiction narratives, the futures depicted in the selected narratives are complex and multifarious. I have drawn upon Chattopadhyay's idea of CoFutures, which foregrounds that the futures emerging from the rest of the world (apart from the Euro-American center) are complex, relational, lived, and embodied as they develop from marginalized and multiple worldviews. Hence, they are not exclusionary but participatory and can help envision ecological sustainability in a relational pluriverse.

In this section, I have tweaked the idea of CoFutures in three ways: a) inclusivity of marginalized communities and non-humans in the imagination of future(s); b) communal bonding via leveraging technology for community's benefit; and c) ecological sustainability in the relational pluriverse. I have related the idea of CoFutures with Escobar's idea of Pluriverse to establish that future imaginaries coming from the non-white SF narratives offer us a way to look beyond the notion of a single, universal, techno-scientific future for all humanity, which thereby helps in establishing a pluriverse where multifarious and alternate ways of life can co-exist together. For example, it can be observed that in Singh's future imaginaries, human/non-human interactions, relationships, and connections are derived from indigenous cosmology, beliefs, and embodied ways of living, thereby promising a non-dominant political ecology. Moreover, besides being inclusive to non-humans, the futures envisioned by Singh do not follow the end-of-the-world narrative strategy found in most Western science fiction fantasies, where the world is 'saved' by a male, white superhero. Instead, the stories offer a vision beyond the white, hetero-patriarchal version of the future, where local female characters bring about a constructive change.

5.1 Possibilities for Future Research: Recommendations

In brief, this research has presented alternative imaginaries of the future beyond Western epistemology by challenging the uni-directional techno-orientalist approach of Western science fictional narratives. My research identifies how future imaginaries from South Asia, such as the texts of Singh, can provide alternate ways to engage with global climate change discourse. As this research has dismantled the binary opposition often drawn between scientific knowledge and local wisdom, my research has paved the way for a pluralistic and relational outlook in finding solutions amidst the impending climate crisis. The selected texts offer an alternative conception of the future – that allows for a synthesis of scientific prowess and local ecological knowledge. In this way, it provides a more nuanced representation of problems related to climate change since it is rooted in local contexts.

Moreover, via advocating pluriversal and relational approach, this research suggests that neither science nor local knowledge can be deployed in its own right, or individually. Rather, it indicates the urgency of the dialogue between the two; both should actively engage with each other to envision sustainable futures. Therefore, this relationality offers a non-dominant account, offering the potential for just futures. As a result, this research provides many avenues for future research where the compatibility between scientific knowledge and local wisdom can be studied for a solution-centered approach. This research also paves the way for researchers to identify and explore the local and indigenous epistemologies in different cultural contexts and how they can be brought together with modern scientific knowledge. This will also help preserve the rich reservoir of indigenous knowledge eroded because of either colonial projects or capitalist gains.

Moreover, this research highlights the need to engage with popular fiction genres such as Sci-Fi, Cli-Fi[31], and solar punk, which can help create awareness about global and local issues. As this research is centered on an Indian SF writer, it shows how SF writers from South Asia, such as India, Pakistan, Bangladesh, and others, can contribute to the emerging scholarships regarding the concerns of local people concerning climate change. For instance, in the recent past, there has been a surge in academic scholarship in Pakistan regarding environmental thought in the Pakistani context. In addition to many postgraduate students, several critical scholars have come forth to underscore the need to discuss Pakistan concerning environmental concerns. Sonia Irum's recently published book *Environmental Thought in Contemporary Pakistani Fiction* is one such example that underscores the urgency of producing environmental scholarship in Pakistan to bring to the fore Indigenous tradition, which may help to create a counter-narrative in dealing with the effects of climate change. The study explores the novels of a Pakistani writer Uzma Aslam Khan from the perspective of the environment to highlight "what Pakistan is and not what it has been constructed" (Irum 4); making it one of the first comprehensive ecocritical academic contribution in Pakistan. .

Through this research, I propose the urgency and need to produce academic scholarship and literary narratives regarding ecocritical studies centered on climatic fiction, Indigenous people, and decolonization in Pakistan and other South Asian countries. I read Singh's SF writings as one such contribution to the global climate change discourse. Her narratives outline the importance of dealing with international

[31] Cli-Fi or climatic fiction refers to a genre of literature and film which explores the impact of climate change on societies, environment, and human/nonhuman life. It is often represented via sci-fi undertones.

issues, such as climate change, from a local context. While this research is limited to analyzing only Singh's selected fiction, the implications are far-reaching to the broader scope of futuristic studies and environmental humanities in the non-Western context. By advocating for pluriversal, relational, and just futures, this research has reminded us that the future is not a singular, monolithic, or universal construct, but a dynamic, dialogical and relational space. In the future, I aim to build upon this research foundation to explore climatic fiction narratives produced by other South Asian writers.

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