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**Genetic Engineering in the Age of Globalization: Echo of Humanistic Apocalypticism
in Margaret Atwood's *Oryx and Crake***

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Letter of Approval

This thesis entitled “Genetic Engineering in the Age of Globalization: Echo of Humanistic Apocalypticism in Margaret Atwood’s *Oryx and Crake*” submitted to the Central Department of English, Tribhuvan University by Khushbu Das has been approved by the undersigned members of the research committee.

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Abstract

This research analyzes the impact of genetic engineering to the ecosphere in Margaret Atwood's Oryx and Crake by applying ecocritical perspective. It focus on the issue of how genetic engineering in this age of globalization has been the causative factor in destroying the environment/ ecological balance. This research shows how the anthropocentric behaviours has destroyed the nature, ecology and brought mass devastation. The ecocritical insights envisioned by Lawrence Buell, Vandana Shiva and Jeffery M. Smith are used as theoretical parameters to analyze and interpret the primary texts. It also uses the environmental apocalyptic theory by Frederick Buell and Lawrence Buell as an explanatory framework or conceptual framework to explain how human centeredness or selfishness has caused environmental apocalypticism.

Key words: Genetic engineering, Humanistic apocalypticism, Eco-centrism, Anthropocentrism, Distopia.

Oryx and Crake strongly dramatize our collective anxiety that we are even non engaged in a process of irreparable violation. It shows devastative, destructive and worse condition of human beings, animals and nature in this post-apocalyptic fiction. It focus on the issue of how genetic engineering in this age of globalization has been the causative factor in destroying the environment, nature and human species from ecocritical perspective.

Much of the action in the novel takes place in the memory, through a series of flashback to Snowman's last life as Jimmy. In these memories Atwood also outlines the shape of her near future dystopia. Jimmy has grownup in a society of corporate control and grotesque simulacra. This future casts its marginalized masses out to the "pleeblands", spies on its workers, and executes those who betray its corporate ideological investments. And, like other repressive systems, the enforcement of increasingly totalitarian power in this future attracts its own opposition, in the form of ever-more-radical acts of bioterrorism. This is the background of Jimmy's recollections of his troubled family life, his friendship with the mysterious and brilliant Crake who in a supreme act of bioterrorism, will release the plague virus that destroys most of human and his obsession with the mysterious and exotic sex-worker Oryx, whom he may first have seen on a child-porn website when he was a boy.

Through Jimmy's memories Atwood dramatizes how weak the ties between present and past have become: he and others of his generation know little and care less about the old world that is rapidly disappearing under the detritus of lowest – common- denominator popular culture and the radical commodification of everything, not least the creative arts, but most especially the products of unthinking genetic experimentation. He recalls how he mocked his parents, nostalgia for a world that was cleaner and freer than the one they now inhabit: "everyone's parents moaned on

about...remember when you could drive anywhere? Remember hamburger chains, always real beef, remember hot dog stands? Remember before New York was New New York?...boohoo”(75). Jimmy’s memories of this period are redolent with the imagery of extinction (underlined by recurring references to “Extinctathon” one of the internet games that he and Crake plays as a boy) and the final Extinction is our own: “kingdom, phylum, class, order, family, genus, species. How many legs does it have? Homo sapiens, joining the polar bear, the beluga whale, the onager, the burrowing owl, the long, long list”(409).

He remembers the old world before entering corporate control "Pleeblands" where everything was real , no commodifications of things existed. Where no products of unwanted genetic experiments existed. It waste world where they could go anywhere, where real beef in hamburger was served in Hamburger chains. Again his past memory of old world is displaced by the memory of his life in Pleebland where he used to play games on intrnet with his friend Crake and finally his extinction from that world too.

Oryx and Crake is a story about evolution, but not natural. Rather it is a new and “unnatural” evolutionary process set in motion by our human “tampering” in biotechnology this has sometimes been referred to as “participatory evolution” by writers more optimistic than Atwood about our abilities to guide such a process. Atwood’s new world on the other side of techno scientific disaster, product of culture’s ultimate reconstruction of nature, has all too quickly arrived at the same “end of history” . Human civilization/human society is no more and the new earth is becoming polluted by bio- engineered plants and that are in the process of wiping out natural species. It will, perhaps, be repopulated by Atwood’s version of future Posthumans.

Atwood's Posthumans are the "Crakers" or "children of Crake", bio-engineered by Crake, Jimmy's best friend and the novel's very own mad scientist. They are all very beautiful, they are vegetarian, they are peaceful and non-territorial; but Crake has "edited out" (374) many "undesirable" human traits, so that the Crakers lack self-consciousness, humor, and irony as well as jealousy, aggression, and territoriality. Like Time Traveler, Jimmy/Snowman, survivor from the now-destroyed world of technology and commodities, is an anachronism among them: "I am your past", he thinks to himself. "I'm your ancestor, come from the land of the dead...I can't get back. I'm stranded here" (129). On the other side of the historical disaster, the Crakers personify the end of history with a vengeance. They live in a frozen and unchanging present moment, with no memory of a past and no anticipation of a future- "they don't count the days" (434). In any event, there is no longer anything like a future to anticipate.

Jimmy/Snowman looks to the stars for comfort, but he finds no comfort in the vast wheel of the Universe; "he lies on his back..gazing up at the stars through the gently moving leaves. They seem close, the stars, but they're far away. Their light is millions, billions of years out of date"(133). Atwood's environmental dystopia is full of genetically engineered hybrid creatures and the humans.

In this research, therefore, I argue that genetic engineering is dramatically reversing the ecology with the promotion of monoculture, in this age of globalization, identical species are displacing the global biodiversity. The extreme greed and profit making nature of global corporate culture has been primary factor in this change in ecology. I argue, corporate world is spreading GMOs easily throughout the globe in the disguise of free market.

The research questions the study attempts to answer are: (a) what ecological

future could be imagined in the age of genetic engineering? (b) How are genetic engineering and globalization interconnected, and are the causative factors in destroying the environment/ nature and human species of the world?

Correspondingly, the specific objectives of the study are to: (a) analyze the impacts of GE technology on the future of ecology; (b) examine the interconnectedness between genetic engineering and globalization to see how they are the primary factors in destroying the environment/ nature and human species.

This paper makes an attempt to explore the impact of genetic engineering on the ecosphere in Margaret Atwood's *Oryx and Crake* by applying ecocritical insights envisioned by Lawrence Buell and Vandana Shiva as theoretical parameters to analyze the primary text. The researcher claims that Genetic engineering has been the causative factor in destroying the environment, nature and human species.

Genetic engineering, from its very conceptualization, has been very controversial issue. Many speak for the promotion of genetic engineering technology for human benefits. They argue this technology has been very effective in curing fatal diseases, and enhancing the efficiency of agricultural products to feed the growing human population. On the other hand, others point out the development of “unnatural” organisms on the earth. They also speak against the technology by demonstrating harmful effects that GMOs (Genetically Modified Organisms) can bring on human health and biology. However, economic aspects deteriorating global ecological balance associated with genetic engineering is less discussed area in this context.

This paper aims to analyze how Margaret Atwood's *Oryx and Crake* shows the environmental Apocalypticism due to human beings encroachment upon the nature, which leads towards the destruction of the environment. Atwood shows very pathetic state of the environment through her novel. She creates the dystopian vision

which hints towards the end of the universe. The novel hovers around the issue of science and environment, and the future of the earth.

In short, this novel displays how technology can be harmful for nature and human species if it goes uncontrolled. Atwood shows that people are only concerned to earn the money, they never bother about the life of the other species. Corporation made the pills but it never helps to the human health, it's the only duty of scientist because pills are dangerous for human health. Scientists are busy to test DNA for the new invention but in the name of invention they are inviting many diseases which are really dangerous for human health as well as health of all species. It shows that human encroachment is responsible for the end for the earth.

Human behaviors are directly or indirectly responsible to the change of the ecology or eco-system. When modernism started in western countries, it brought many changes in science and technology, industrialization, medicine, astronomy and many more. Capitalism and industrialization started to create gap in the human mind regarding human being and nature. After the invention of science and technology man started to think that man has created nature and they are superior than the nature. The gap in the mind of human being regarding superiority between nature and man create great problem, when man thought themselves superior than the nature or everything it creates great problem which turned towards the destructive force of nature. In the name of the development or progress man has been forgetting their responsibility.

M. H. Abram, one of the prominent scholars in his book writes:

By the later part of the century there was a widespread realization that the earth was in an environmental crisis, brought one by the industrial and chemical pollution of the biosphere [...] the depletion forest and of natural resources, the relentless extinction of plant and animals species, and the

explosions of the human population beyond the capacity of the earth to sustain it. (72)

According to him, human beings are the main problem for the nature and environment because in the name of scientific discovery or experiment they enslave themselves beyond the nature which can create crisis in the nature; it means human activities can bring apocalypses in the nature. In the primitive time there is the harmony among nature and human beings but in the modern time people take nature as a means of production and consumption.

In the similar way, ethical lapses of the corporate world have been the major factor in deteriorating “ecocentric” values that are essential in preserving nature and environment.

Atwood’s *Oryx and Crake* depicts how nature and animals are misused for human purpose and how human activities are responsible for the degradation of environment/nature and human species; where human population on earth has been wiped out by a massive deadly plague, when all that apparently remains are the Crakes (a genetically manipulated group of beings who are similar to but not the same as humans and survive easily in this environment) and snowman, who watches over the Crakes and struggles himself to survive.

Anthropocentrism is the placing of Human at the Centre of everything, so that other forms of life will be regarded only as resources to be consumed by human beings. This novel deals with the destructive human psyche and powers of science or about dire consequences that humankind may face in future if they don’t keep harmony with nature. Never the less, it is clear from the complexities of the novel as a whole that Atwood’s task is not to illustrate some malevolence inherent to science or modern way of life, but to illustrate how human centered psyche and science is

working against the laws of nature and therefore modern science is paving a way for the doom of humanity. We find the same thing happening in *Oryx and Crake*. This research will demonstrate how human encroachments to become superior being are responsible for the destructive future of homo-sapiens and the world. In this way this paper also critique on the idea of Anthropocentrism. The concept of genetic engineering (hereafter GE) underlines the plot of this fiction.

In *Oryx and Crake*, Atwood presents the extreme world of genetic engineering. Animals like Pigoons- hybrid of pig and human Splices, raknuk- hybrid of raccoon and skunk, liobam- hybrid of lion and lamb dominate the animal world in the novel, snat- hybrid of snake and rat etc. the image of “ChickeNobs” presents the possible future of the genetic engineering. Chicken meat is farmed in the factory on stems and do not have faces of the chicken. Only body parts of chicken are produced with the taste of chicken: “...they grow just the muscle tissue, no brain, no pain...” (262). Moreover, the novel surprises the readers with the portrayals of future humans – the Crakers. On the other hand, the consequences of genetic engineering are revealed through Jimmy’s mother. She argues with Jimmy’s father that OrganInc Farm was not a good place to work, whatever they were doing was wrong and to respect the creation of the God and understand the value of interdependency between human and animals. Opposite to her thought OrganInc Farm controls the state mechanisms in fulfilling the interests of the corporate World.

This novel has adopted the rhetoric of “environmental apocalypticism” to depict the future of human and natural world exploited by genetic engineering. During the time of modernism many developments occur which creates environmental apocalypses because man started to destroy nature. Great World War happened and many bomb and missiles were dropped in the face of earth, which destroyed the real

beauty of the earth and it become unliveable place for every creature. Genocide and Holocaust killed the life of many human which can be taken as an apocalypticism. Man treated themselves as a superior than the earth and they started to control the nature which leads towards the end of the earth and apocalyptic of the environment. Nature is completely controlled by human beings or corporate industrial house, which leads towards the crisis. The role of human towards nature is completely harmful so it might be the one of the important cause of environmental apocalypses. It is believed that human beings are guided from materialistic ideology because of that they are not paying attention towards the preservation of nature. In a same way Baljeet Singh, research scholar from India also shows the relationship between ecology and human beings. He argues that “today ecology is defined as the way in which plants, animal and people are related to each other and to their environment. In this relationship they are so much interdependent on each other that any disturbance in one disturbs the other”(1).

Apocalypticism is an approach based on apocalypses, especially which believes in an end of the current world order. It is the belief which talks about the destruction of earth or doom of the earth.

Environmental problems are often associated with human actions and the use of technology. In short, ecological disaster constitutes the heart of the narration: survival of the humans has been challenging, GE- induced viruses have erupted in the whole societies endangering the lives. But, at the heart of this pandemic picture lies the profit- making interest of the corporations and human encroachment to become superior being to become god.

Lawrence Buell one of the great environmentalist, in his book *The Environmental Imagination: Thoreau Nature Writing and the Formation of American*

Culture says that “we are poisoning ourselves irretrievably; we are producing pesticide- resistance insects our poisons cannot control; we are all infected” (308). Here, he means to say that we are responsible for our bad health conditions. He further says that “apocalypse is the single most powerful master metaphor that the contemporary environmental imagination has at its disposal” (285). Bull ideas show the condition of environment if apocalypses happened in the earth. It is the master metaphor for the end of the earth because apocalypse is the stage where nothing will be left in the earth.

Likewise, an apocalypse is the most dangerous threat to the earth. It can be the ultimate end of the every species from the earth. Our ecosystem is in the stage of damage. In present time most of the species are disappearing from the world. The responsible factor of the apocalypticism is the human bad action, over population, scientific experiment, global warming etc. Because of the human greed and their materialistic psyche they forgot their duties and they work against the environment, which is the bad action of human beings. Overpopulation is the one of the cause of apocalypticism because it is the condition which creates many problems in the world, especially developing countries of the world. Overpopulation can cause food scarcity in the world and it can create great problem in the world.

Similarly, Edward O. Wilson in his essay “Apocalypses Now” writes, “The biology of extinction is not a pleasant subject. The death of a species is especially disheartening to the scientists who study endangered and newly extinct species. Together those vanishing remnants of Earth’s biodiversity test the reach and quality of human morality”(44). Because of the scientific knowledge we are going to lose everything forever from the earth. He further says;

When all species disappear at our hands, we throw away part of the history.

We erase twigs and eventually whole branches of life's family tree. Because each species is unique, we close the book on scientific knowledge that is important to an unknown degree but is now forever lost. (84)

Many critics describe apocalypses in their own way, some gives emphasis on human encroachment upon nature and some are on eschatology. Lilley and et al in their book *Catistrophism: The Apocalyptic Politics of Collapse and Rebirth*, comment on the anti-nature tradition or arrogance of human and present the environmental catastrophic “the ecological catastrophe is without doubt the greatest and most serious mass extension, ocean acidification, wide-spread and cataclysmic deforestation (...) number among many other horrors” (5). They describe the possible reason of the environmental Apocalypticism and the ecological catastrophe. Chairs H. Lewis brings the term ‘ecological apocalyptic’ to refer to those scientists and cultural critics who employ the threat of the death of nature or the extinction of humanity to support their calls for the immediate transformation of science and modern industrial civilization. Drawing on the Christian tradition of predicting an end to human history, activist scientists warn of the catastrophic collapse of modern industrial civilization if humanity doesn't end its “suicidal war” against the global environment” (4). In the same way Atwood talks about destruction of the environment in the name of scientific experiment and other work.

In establishing the argument raised, I have set some fundamental research questions to address the issue logically. Almost all environmental writers raise questions on the human inclination to materialistic achievement in putting risks to global ecology. The “anthropocentric” vision of the environmentalists is criticized by the “ecocentric” environmentalists like the advocates of “deep ecology”. In this age of high technology, genetic engineering has offered hope for some, but the ethical

questions associated with the issue have made it controversial. The intrusion of globalization into GE has also been a controversial issue for some. See the dangers of establishing one culture throughout the world putting risk to the global biodiversity. This intrusion also disturbs the ecological balance by the growth of genetic toxicity. The degradation of global ecology with the interconnectedness of genetic engineering and globalization has become problematic in today's world.

Keeping the research question in mind, I assume: with the sense of humanity at the center, genetic engineering has been hope for curing human diseases and ending hunger. This anthropocentric vision, however, might be seen faulty from ecological perspective. The combination of GE with globalization as a trans-border economic activity might put serious risk to the future of global ecology because of the corporate culture of making profit that is harmful to global biodiversity.

To address the research questions raised in this study, the general objective of this research is fixed to analyze Oryx and Crake , from ecocritical perspective. Hence, the specific objectives of the study are to: (a) analyze the impacts of GE technology on the future of ecology, (b) examine the interconnectedness between genetic engineering and globalization to see how they are the primary factor in destroying the global biodiversity.

For discussing on the arguments raised in this study, the theoretical tools of ecocriticism and environmental apocalypticism are applied for the textual analysis of the primary texts. With the objective of drawing authentic conclusions, only the issue of genetic engineering and globalization, and their impacts on ecology are studied with special focus on the insights developed by Lawerance Buell, Vandana Shiva and Jeffery M. Smith.

Literature discussing on the issue of genetic engineering has been usually

focused on the discussion of ethical issues related with it, and discusses on the “right” or “wrong” of the GE technology. However, economic aspects deteriorating ecological balance associated with genetic engineering has not been of much attraction among the critics. As this research study aims at exploring the effects of genetic engineering coupled with the mechanisms of globalization, it contributes in understanding interconnectedness of genetic engineering, globalization, and ecology.

Defining ecocriticism, Cheryll Glotfelty writes, “Ecocriticism is the study of the relationship between literature and physical environment” (“Introduction” xviii). The consequences of human activities on the nature have been primary concerns of the environmental writers, and ecocriticism is the lens through which such literature is analyzed to see how literature has represented this relationship. Because, literature cannot be separated from the society. A writer’s imagination and creativity foregrounds the experience he/she has had with the nature and the surrounding environment. So, ecocriticism “study how nature is represented in literature” (xxii).

We have encountered a number of environmental problems after the introduction of industry and technology. The drive of human to better materialistic life has been blamed for being the primary cause of such ecological risks. Advancement in technology has raised many environmental issues. Environmental writers attempt to correct this human course by creating literature portraying these scenarios, and the ecocritics analyze how literature reflects environmentalist’s concern. Various ecocritical perspectives/ principles/ theories have been introduced by the scholars. Few of them are discussed in the following paragraphs.

Arne Naess propounded the theory of “deep ecology”. He rejects the “anthropocentric” environmental thoughts that are focused on preserving human health only. Defining deep ecology, Greg Garrard writes: “The shift from a human-

centered to a nature- centered system of values is the core of radicalism attributed to deep ecology” (21). Deep ecology movement shifted ecocritics thought to ecological-centered perspectives. Deep ecology denies human/ nature Dualism, and raise voice for saving the “nature” of the nature unspoiled with human foolishness. Genetic engineering technology is the concern of all eco- centric environmentalists.

Genetic engineering has enabled the investors to possess the nature further with the help of IPRs. On the other words, treating the nature as commodity has been heightened after the introduction of GE technology. However, with the strong belief in correcting this human course, the environmental writers are creating discourses describing human and nature relationship, and the “fear” that they have about the future of the ecology.

Lawrence Buell in his seminal essay “Toxic Discourse” states: “The fear of a poisoned world” (639) gives birth to toxic discourse. Since the emergence of industrial development in the nineteenth century, humans have put pressure on the health of ecology. So, discourses with environmental thoughts and intent of raising environmental awareness have been created for the “Protection of the endangered natural world” (640). In doing so, the interdependence between natural and human world have been emphasized in environmental writings. However, growth of new technology, for example, genetic engineering, has endangered the natural world raising the humans in “creator’s position” (“Environmental Apocalypticism” 284). As a result, environmental discourses are created with the ethical motif in response to humankind’s negligence to natural world. The rhetoric of apocalypse has been the popular tool for environmental writers for it is the “most powerful master metaphor” (285) in bringing the risks associated with human’s irresponsible activities into light.

Environmentalism is best described in apocalypticism. Richard Alan Northover

interpret the meaning of “apocalypse” as “End Time” (81) associating the meaning with Biblical reference. Describing the power of apocalyptic metaphor, Buell further argues: the “rhetoric of apocalypticism implies that the fate of the world hinges on the arousal of the imagination to a sense of crisis” (285). Literature has been the effective medium in transferring such environmental concerns of the environmentalists for decades. Environmental writers express their hope of correcting human courses that have been endangering the ecological future by depicting the dystopian world. Northover explains: “while literature is one of the conditions of civilization that has made an environmental apocalypse possible, through imagining the apocalypse, literature may help to end the threat and, hopefully, forestall its unimaginable trauma” (94). Genetic engineering, for many, has troubled the future of ecology, and so, the rhetoric of apocalypse has been effective for them to depict the “fear” associated with it. This novel is concerned with ecology and genetic engineering, and emphasize on the consequences of modern technology that goes uncontrolled.

Genetic engineering has been very controversial issue since its inception. Scholars in support of GE have offered the possibilities of ending the hunger of the growing population of the world with the genetically modified hybrid seeds. Similarly, they demonstrate the abundant possibilities of saving the organisms in the verge of extinction, and even the revival of extinct animals and the plants. GMO supporters point out the troubles the future human generation has to face due to the lack of sufficient food in the world of changing environment.

In addition to these ecological issues, the economic threat of the genetically engineered food has been the major concerns for the critics like Vandana Shiva, Jeffrey M. Smith and Janet Hope.

Globalization, in general, refers to the activities which are expanded beyond

national boundary. Defining globalization, David Held et al. write: “Globalization can be taken to refer to those spatio - temporal process of change which underpin a transformation in the organization of human affairs by linking together and expanding human activity across regions and continents” (67). Globalization makes it possible for any social, economic, or political issues that go beyond frontiers, and make its position in the globe. As Shiva Claims, the interest of Corporation in Globalization, naturally, is to expand its business beyond the national boundary. Talking about the nature of globalization, Held et al. explain:

The concept of globalization implies, first and foremost, a stretching of social, political and economic activities across frontiers such that events, decisions and activities in one region of the world can come to have significance for individuals and communities in distant regions of the globe. In this sense, it embodies transregional interconnectedness the widening reach of networks of social activity and power, and the possibility of location at a distance. (67)

The exploitation of environment and biodiversity has been the major concern of the “ecocentric” environmentalists. The earlier environmental movements of 1960s have been blamed for being “anthropocentric”. And the question of “ethic” has been in the center of the nature versus human arguments. The anthropocentric environmentalists express their concerns for saving the “humanity” by ending world’s hunger, though it demands the exploitation of nature.

On the other hand, the ecocentric environmentalists see it as crime to exploit the nature only for the human. “if we try to save the nature, some persons will go hungry”(457), writes Holmes Rolston III in his article entitled “Feeding People Versus Saving Nature,” pointing out the ethical issue related to this debate. As Holton

shows, the issue of putting the world's hunger at end is just the "masks" of the richer countries because they spend much on military power and physical infrastructures without spending in poor countries to feed the hungry people.

Genetic engineering has been boon for the multinational corporations in expanding their business beyond the boundary of the country of origin. Not only the expansion of economic activities of corporations but also the displacement of ecological diversities is the issue not discussed in detail. The economic and ecological threat posed by the genetic engineering is focus of this study. In other words, the "fear" of genetic engineering are discussed by critically analyzing the text: *Oryx and Crake*.

Gregory R. Berry, in his review entitled *Oryx and Crake* by Margaret Atwood writes "Atwood strikes a note of warning as unambiguous as Shelley's in *Frankenstein* by calling attention to the surreal dangers of science and technology run amuck. This is not a novel exploring the theme of science out of control; instead, it is a story of science doing exactly what the men in white coats intend.

Berry further writes her scenario gains power and relevance from our current preoccupation with bioengineering, cloning, tissue regeneration, and agricultural hybrids and our social obsession with youth and the merchandising of beauty and health. Our faith in development, progress, and rationality to solve all of tomorrow's problems seems naïve in Atwood's view and will result in the dystopic vision presented here.

He explains that Atwood explores the triple whammy of runaway social inequality, genetic technology, and catastrophic climate change caused by environmental indifference. Most frighteningly, Atwood makes this all sound inevitable, and her art creates the realization that this vision is not farfetched. Atwood

presents an exquisitely designed horror show in which life is subtly changed from what we know to a dream version of what we do not...but many things seems so familiar. Mother Earth has been tortured and mocked but survives; humans may not.

Angela , in her review entitled a problem of the image in “Oryx and Crake” Writes “Crake used his position as a leading researcher for a top bio- tech company to imbed a deadly pathogen, known as the JUVE virus, into a pill intended to enhance sexual performance and prevent the spread of sexually transmitted diseases.

Simultaneously engaged in a second project to perfect genetic modification of humans, Crake used this project to design an entirely new kind of human, one capable of living in harmony with the natural world. Although Snowman remains unclear as to his friend’s exact motives even at the conclusion of the novel, Crake’s primary impetus seems to be his desire to affect lasting social change. Crake cannot see any other way of challenging the power of the multinational corporations, preventing the further destruction of the earth, and combating the tendency of human beings towards selfishness and greed.

Moreover, Crake has internalized the dehumanized worldview to which he has been constantly exposed since childhood and consequently takes the drastic action of attempting to start over. That he sees himself as a god figure is evident in his desire to recreate the Garden of Eden, a desire which requires the eradication of flawed human beings and the creation of a new type of human designed without the knowledge of good and evil. Yet, Crake refuses responsibility for the Children of Crake beyond their design, leaving only Snowman to protect them after he chooses death for himself and Oryx. In all of his actions, Crake embodies a suicidal- homicidal will that cannot be bargained with at any level. He never discusses his plan with any other person, and only Oryx seems to suspect his intentions. The scale of his actions only serves to

underline the absoluteness of his decision and his conviction that it is right.

Heather Duerre humann in his article Margaret Atwood: *Oryx and Crake* published by Johns Hopkins University Press writes “*Oryx and Crake*” as a cautionary tale about the potential ethical and environmental dangers of scientific experimentation and genetic manipulation. In “Moral/ Environmental Debt in *payback* and *Oryx and Crake*,” Shannon Hengen uses Atwood’s 2008 nonfiction book, *payback: Debt and the Shadow Side of Wealth* as a lens through which to view the environmental and moral dilemmas that play the characters represented and the society depicted in *Oryx and Crake*. Hengen points out that in order to have “a concept of moral and environmental debt, humankind must have a sense of... the interconnection of ourselves with nature” (129), and she then questions where such a discourse exists in contemporary society.

Like Hengen, Karen F. Stein discusses the ethical questions presented by Atwood. In her essay, “Problematic paradise in *Oryx and Crake*” Stein compares Atwood’s over-reached/ scientist Crake (and his misuse of science) to Mary Shelley’s *Victor Frankenstein*. Similarly, in “The Apocalyptic Imagination in *Oryx and Crake*,” Mark Bosco explores the moral and environmental issues that pervade the narrative. He notes that, through this narrative, Atwood “weds the real decadence of contemporary consumer and corporate culture to the unchecked advances in genetic engineering that frequent today’s headlines”(157).

N. Katherine Hayles has argued, “Visions of the future, especially in technologically advanced eras, can dramatically affect present “developments” (131). This novel is in its own way, a story about the problematic impact of the future – the future in/ as techno culture – on the present. Atwood’s *Oryx and Crake* (2003), a satire about the catastrophic potential of increasingly commodified techno science.

The novel by Atwood treats the future as a kind of impossibility. This novel is a retro disaster novel about out of control bioengineering and ecological collapse.

On the other hand, Gerry Canavan demonstrates that there is no future for consumer in the apocalyptic world of *Oryx and Crake*. He reads the novel as the picture of the “post- capitalist” future and the end of the history. Everything is commercialized: not only the GE food but the murderous game of painballers- blood thirsty group involved in killing- are telecasted for the capitalist’s benefit.

J. Brooks Bousan reads the novel as the projection of “deep ecology”. Deep ecologists raise the voice in the paradigm shift in environmental movement critiquing the earlier movement being “anthropocentric,” and call for treating nature having the same value as the human. They claim that it is not the right of human to exploit the nature and control the nature. Deep ecologists call for biocentric vision and ask to use nature for the minimal requirements for survival. By presenting the world of God’s Gardeners, Brooks says: “Atwood critiques so called shallow environmentalism and reflects in a sustained way on deep ecology and radical environmentalism” (342). Bouson seems to agree with Canavan in the interpretation of the *MadAddam* trilogy because he also reads the novels as the end of capitalism.

Atwood critiques our culture’s unsustainable, energy- intensive and consumption- driven life- styles, which keeps us dependent on and in thrall to energy companies, she also gives voice to a deep fear that has come to haunt environmentalists: that multinational capitalism’s plundering of natural resources and its accelerating use of green house- gas -emitting fossil fuels to meet the ever increasing material demands of a growing human population will lead humanity no to a progressive utopian future but instead to the dystopian horrors of a global eco- catastrophe and societal collapse.”(345)

Adami finds genetic engineering as the key concept in Atwood's dystopian novel. However, geneticist Anthony Griffiths criticizes Atwood's world of genetically engineered organisms. Griffiths thinks that "Atwood seems to have formed her views of genetics only from her reading of the popular media"(192), without having deep research on the genetics. Because, he argues, the nature of hybridity as she presents in reality, is not possible in science.

The survey of the literature makes it clear that critics have analyzed the rhetoric of apocalypse in the text. Genetic engineering dominates the plots of the novel. Critics, to some extent, have demonstrated the role of capitalism in the future of market. However, it is noticed that they have not discussed much on the influence of globalization shaping the mantras of capitalism in the modern world of the twenty-first century dominated by technology of genetic engineering. That is why, this research work attempts to fill this gap by analyzing this novel from ecocritical perspective to see how genetic engineering in the age of globalization may put risk on the future of ecology.

This research examines and analyses how genetic engineering has become the causative factor in expanding the empire of corporate culture over nature. The process of expanding the control of international corporations over global natural resources by means of genetic engineering technology is defined as "bioimperialism" by Shiva. She describes that "bioimperialism" the belief that only the knowledge and production of western corporations need protection"(81). Biotech companies are talking unethical advantage from genetic engineering technology.

Genetic engineering has presented serious threat to the future of biodiversity. The "fear" of genetic engineering is not only limited to the issue of "natural" or "unnatural" products. The fear is further heightened due to corporate interest of

controlling food market. Consumers are bound to consume only what these companies offer.

However, GMO promoters have destroyed biodiversity throughout the world. As critics argue, genetic engineering technology has elevated the humans in the position of creators (Buell, "Apocalypticism" 284; Shiva, *Stolen Harvest*, ch. 2).

Genetic scientists claim themselves as the God. Crake, the geneticist, claims: "we are God. We can erase unwanted features or add new features to human/animals/plants genetic. We are What we are, and the Worlds ours. We are its gods" (230). But, the genetic engineers, as Shiva in her book *Stolen Harvest* opines, do not "create" new variety, they just modify the seeds by adding or altering its genetic composition and preserve their "Creation" by means of IPRs(ch.1). Through the combinations of the genes, they just introduce "hybrid" plants or organisms. Shiva further claims:

"Although genetic engineering and biotechnology only relocate existing genes than create new ones, the ability to relocate and separate is translated into power and right to own"(53-54). However, Crake, a geneticist speaks for genetic engineering technology and claims: "through genetic engineering we can erase unwanted hairs from our face so that we do not have to shave it on regular basis"(241). The words of Crake highlights the claim of GMO supporters for the need of genetic engineering in the modern society. Nature, as they argue, has been modified by human for ages. So, the concept of pure nature is fake in their eyes. However, GMO supporters like Crake have overlooked the speed of natural destruction that is resulted by the alteration of natural evolution.

The greatest "fear" associated with GMOs is that it tampers the natural evolution of all species. Thus, genetic engineering alters the "natural" harmony of the ecological system.

Another "fear" associated with GMOs is the human health issue. Though the producers of GM foods are claiming that the GM foods are safe to consume, the process GM foods production that are in practice raise doubts about it being safe to consume. More than this, the question of humanity is muddled in the eyes of corporate culture. They even inject epidemic diseases in their products for the benefit of their corporations. Atwood in this novel informs us that the pharmaceuticals even implanted epidemics in the medicines. Crake is a geneticist who was working on producing the pills that make one immortal and the super sex pills known as "BlyssPluss" which gave you the best sex ever, but it had serious side effects, such as death...That`s how pandemic plague started"(395). The corporations are blinded with profit seeking mentality by hook or by crook. The production of "BlyssPluss" pills represents the nature of multinational biotech companies promoting GMOs.

For Supporting GMOs, corporations are producing discourse claiming its safety. Smith explains: "With less research money available from public sources, more and more scientists in the U.S. and Europe are dependent on corporate sponsors, and hence, corporate acceptance of their research and results"(39). Shiva elucidates, "The globalization of patent is an expansion of the economic paradigm that has caused ecological destruction and contributed to the disappearance of species"(78). With the introduction of genetic engineering, the corporate products are spread throughout the globe displacing the local biodiversity gradually.

Atwood adds "The CorpSeCorps.... started as a private security firm for the Corporations, but then they`d taken over when the local police forces collapsed for the lack of funding, and people liked that at first because the corporations paid, but now CorpSeCorps were sending their tentacles everywhere"(25). Shiva agrees with this scenario of corporate control: " As conditions of everyday life become increasingly

controlled by outside forces and systems of local governance decay"(103).

Atwood presents the vision of corporate controlled world blinded with profit seeking mentality that goes unchecked. Corporations not only attempt to destroy the local variety, but they have cut-throat competition among themselves. In the world where genetic scientists are valued, scientists are often kidnapped for corporate benefit. Jimmy`s mother , was kidnapped by the Corporations spy and security members and her assassination was aired on the dark web as she was knowing exactly what these corporations do in the name of genetic engineering and she was against of it. The Corporations didn`t wanted the outer world to know about its darker side so they killed those people who went against them or spoke against them....or they felt that certain people are emerging as a threat to them. However, the corporation, HealthWyzer, "had done a cost-benefit analysis...and they`d decided the disease germs and formulas were worth more to them"(293). HelthWyzer, in fact, was working on inserting "gene-spliced disease germ inside their supplements so they could make a lot of money on the treatments"(293). The corporate culture growing inside HelthWyzer presents an example of how corporations work to establish their monopoly in the market making maximum profit.

The extinction of various animals and plants reflects the "fear" of genetic engineering as discussed by Shiva in her book Biopiracy, and Smith in Seeds of Deception. Thus, the "fear" associated with GM technology is apocalyptic, that is "the end" of biodiversity. Genetic engineering has been more apocalyptic after the inception of globalization.

In the age of globalization, "free market" policy evaluates everything in monetary value. The humanitarian and ecological benefits that an ideal nation offers are overshadowed in such countries. The sense of ethics is almost dumped in the GE-

run corporate world. The corporate investors are so much blinded with the profit-making motif that they even use humans as "guinea pig" for the experiment of their products.

Atwood presents the possible "distance future" of genetic engineering in her novel. Sexual intercourse, the regenerative source of life, becomes just "incessant sexual twitching" for the people of the world of genetic engineering. Because life forms are produced in the science lab, not in the nature "naturally". Jimmy believes in that sex is, in fact, just the "generative act"(137), but in the corporate world of genetic engineering, even the sex has been commercialized. The genetic scientists were producing sex pills named "BlyssPluss" for "Hassle-free sex, total satisfaction, blow you right out of your skin, plus 100 percent protection"(130). Another example of corporate greed is "SecretBurgers", "The secret of the SecretBurgers was that no one knew what sort of animal protein was actually in them"(33). The CorpSeCorps men let the local Pleemobs run secret business of selling human organs, and that "During the glory days of SecretBurgers, there were few dead bodies found in the vacant lots"(33). Using humans as guinea pigs is less horrible than the secret of the SecretBurgers. Thus, everything in the corporate world of genetic engineering is evaluated in monetary value and profit where "ethics" get lost in the desert.

However, the benefits that genetic engineering can bring in saving the humanity and the biodiversity has not been denied. If it is not use by the corporations for their corporate benefits, it would offer hope for the future. what the corporate world lacks is the sense of ethics in doing business. It is made clear in these words that saving the biodiversity is possible only in the "ethical" world where human-nature chain is not muddled by corporate profit making intent. Loss of biodiversity is the result of extreme human greed of seeing everything from materialistic benefit. The

genetic engineers developed the crops that could resist GE induced plagues. This scenario brings the issue in the light that genetic engineering alone cannot be blamed for damaging the biodiversity. However, when this technology is controlled by the corporations, the biodiversity gets lost.

In nutshell, genetic engineering coupled with globalization exploits the natural resources to its corporate benefit. Human imagination knows no boundary till someone is not bound to ethical sense. Absolute commodification of natural property has threatened the sense of ethics. In this context of "ethical lapse", humans are striving towards the concept of "perfection". Concept of perfect livestock, and even the fantasy of perfect body/ baby have been evolved in the modern world of genetic engineering. "Soon, some predict, parents will be able to choose many traits- short or tall, cautious or risk taking,"(2) writes Peter Kendall, a science writer. The concept of "eugenics," that is judging the qualities of organism by means of binaries of "good" or "bad", has been promoted after the emergence of GE technology. After the emergence of the GE technology "the eugenic notion that were "good" genes and "bad" genes, and good and bad traits, and the seductive thought that we actually had a choice between them, began to take hold" (Cummings10).

The DNA of any organisms constitutes many genes with particular traits. GE technology has enabled the scientists to activate certain genetic traits and mute unwanted traits. Talking about the future of genetic engineering Michael J. Sandel elaborates: "The predicament is that our new found genetic knowledge may also enable us to manipulate our own nature – to enhance our muscles, memories, and moods; to choose sex, height and other genetic traits of children; to improve our physical and cognitive capacities; to make ourselves better than well"(5-6). This desire of humans for being better than well leads to creating many organisms with

advancement in genetic engineering technology.

The term "splicing" has been popular among the geneticists. The genes of one organism having special "traits " are inserted into the genes of another organism which modify its natural and organic traits. Pigs were engineered with human genes in 1985 for enhancing faster growth of animals (47). However, the growth was so extreme that the pig "has a body weight that is more than its leg can carry" (Shiva, Biopiracy33). The outcome of spliced pig indicates the uncertainty of GMOs.

Presenting the possible outcome of such human splicing, Atwood in the novel writes:

Three huge pigs are nosing around the swimming pool- two sows and a boar. The morning light shines on their plump pinky-grey forms; they glisten like wrestlers. They seem too large and bulbous to be normal...Especially, they must be, from some experimental farm or other. (18)

The "large and bulbous" pigs resembles the spliced pig discussed in the previous paragraph. The fear of Jimmy is heightened seeing those pigs because those are not ordinary pigs , those are super pigs... spliced with super brain tissues."(390). Human genes gave the pigs "wrestler like" muscles; the abnormal size and the thinking ability of the pigs reveals the consequences of human greed. Atwood expresses her "fear" associated with human splicing by introducing superpigs in the novel.

The story does not end only in the creation of pigs that are full of muscles, but it further reveals that these pigs, infact are farmed to grow human organs inside these pigs. On the other words human organs are framed inside pigs body. Here lies very sensitive question: if human gene induced pigs can think like human, is it not possible that human might develop some pig-like traits? No, doubt, the genericists try their best not to have such accidents. But who knows what future it brings out. Critiquing the nature of genetic engineering, Timothy Morton, in his book *The Ecological*

Thought, states: "What`s wrong about genetic engineering is that it turns life forms into private property to enrich huge corporations"(86).The lack of ethical sense is best demonstrated in the act of HealthWyzer, a pharmaceutical corporation. It "had been sticking a slow-acting but incurable gene- splice disease germ inside their supplements so they could make a lot of money on the treatments"(293). Glenn's father worked in HealthWyzer, but "he got unhappy when he found out they were seeding folks with illness via those souped-up supplement pills of theirs- using them as free lab animals, then collecting on the treatments for those very same illness"(244). The extreme profit making motive of the corporations like HealthWyzer reveals the nature of global capitalism. They are only centered on establishing monopoly, and ultimately destroying the life- generative quality of the nature.

The scientists with a strong sense of ethics could not bow their heads in front of unethical corporations, and came to join the group. Talking about the principles of deep ecology, Naess proposes: "The flourishing of human life and cultures is compatible with a substantial decrease of human population. The flourishing of non human life requires such a decrease" and that "Humans have no right to reduce this richness and diversity except to satisfy vital needs"(50). The mass die-off of the human race which was the result of extreme experimentation of genetic engineering, probably, does justice to the rest of the non human species for the unjust treatments that the human has done on to them.

The introduction of Crakers offers the ultimate possibility of the eugenics of human gene splicing. The pandemic that attacked only the humans and "leave all Creatures untouched" (424), cannot inflict "perfect" human gene-splicing of Crakers. They are developed by Glenn, as Crake. The Crakers are spliced with, many other animals. They possess the best natural traits existing in the nature. Like the baboons,

they mate when they turn blue, do not have any hair on their body, and they can heal their wounds by cat-like purring. They copulate only when the female is in season. The features was added to "Facilitate mate selection. Eliminate romantic pain"(412), and they live in harmony with the nature. The Crakers presents the possibility of future human.

Human splicing, in the real world, has raised many ethical issues though it has been already in use in curing fatal diseases. But, human desire of being perfect, in this competitive world, with the feeling of being superior to all other living organism, might lead to producing perfect babies.

Most of the environmentalists would agree that some control of biotechnology is necessary in order to protect the human and the nature. Preserving biodiversity has been very challenging in this age of genetic engineering. Because of extreme manipulation of the nature for benefit especially by the corporate world, apocalyptic end of the world could be imagined.

The discussion of this text has logically presented that the genetic engineering has been boom for the biotech companies to produce livestock with desired traits. Mutation of unwanted traits and the activation of desired traits on any organism has been successful by means of genetic engineering. As GMOs cannot sustain life without the support of toxic chemicals, the nature is victimized. In short, surviving depends on living in harmony with nature. Co-participation, integration, strong sense of bioethics, and mutual understanding of the values of biodiversity are the keys to survival in the age of genetic engineering.

This research was initiated with the assumption that genetic engineering is getting more problematic in the age of globalization. The present world is facing innumerable environmental problems. As most of the environmental writers agree,

lack of bioethics, especially on corporate people, has been the causative factor for this crisis. The environmental risks associated with genetic engineering have been argued as the: (a) spread of toxic chemicals; (b) alteration of traits of natural flora and fauna; (c) development of monoculture crops and livestock; and (e) spread of sudden pandemic diseases. This study has distinctively established the claims being true. Significantly, the destruction is the outcome of uncontrolled economic activities of biotech companies for making maximum profit and human greed to become god and create perfect human.

The life of commercial people living inside the compounds, exploiting nature from anthropocentric perspective. The hybrid animals like rakunk, pigoon, liobam, Mo'Hairs, and the farming of faceless chicken known as "ChickeNobs," present what the world of genetic splicing would be like. The ethical lapse of corporate world for making maximum profit is visualized in the practices of HealthWyzer, a pharmaceutical company. HealthWyzer uses humans as guinea pigs for testing its drugs. It inserts viruses in the pills to make its consumers ill, and producing pills in curing the diseases created by the company itself.

GE induced viruses bring global pandemic killing almost all people from the earth. Those who survived are genetically modified human known as Crakers and Jimmy now known as Snowman. One of the major strengths of this text is the image of future genetically modified humans, Crakers, demonstrate the possibility of human splicing. Through the "production" of the "perfect babies" have been illegal, pigs with human splicing is already in the market. Pigoons explores further possibilities of creating animals that can think like humans. The role of CorpSeCorps proves how private companies can demolish the government system and rule over the country. Human are creating their own type of atmosphere, they puts themselves superior than

the nature. They change the nature in their own way and they break the law of the nature and its independence. Humanity has caused the 'end of the nature' and the end of separate and independent world. The novel *The Year of the Flood* shows the same types of human behavior. The CropsSeCrops and the Corporation group are the representative human group who create their own environment. The world is not in a normal condition because many countries have been facing many problems which show that the men are responsible to create these unnatural things and which is the one of the important reason of environmental apocalypticism.

Through out the research, it depicts that environmental apocalypticism is happening in the world due to the greed of human beings. Human beings become the responsible factor to happen apocalyptic because they uses modern technology and instrument to exploit the nature. They forgot their role and thought that they are the superior than the other species which turns to the negative thought of man which is intolerable for nature or earth. Modern people run after money and power, they have ego to satisfy to become powerful , for that they are ready to do unnatural activities in the nature which became the ultimate cause for environmental apocalypticism.

Hence, Atwood in *Oryx and Crake* becomes successful to portrait the backdrop of genetic engineering in the age of globalization and the echo of Humanistic Apocalypticism. It is the global pandemic which causes apocalypse in the earth. It is the story of survivor character Snowman (Jimmy) which is full of the environmental apocalypticism due to the human encroachment upon the nature.

Anti-human tradition or arrogance of human beings is the serious cause of the environmental apocalypticism. In the name of innovation and experimentation they started to test everything whatever they wants to test. They forgot the bearing capacity of nature and what will happen if nature becomes benevolence towards human action

which is not in favor for nature. *Oryx and Crake* depicts the same types of bad action done by human beings in the name of experiment or innovation. They make a medicine pills but it is dangerous for human health because of which human species were wiped out from the earth. Corporation house makes SecretBurger, which is made by the blood of the animal, another experimentation is DNA clone of human body in animal because of that many disease transmitted one body to another. In the present time the predictions of doom have been coming one after another. Massive hit of earthquake, flood, tsunami and other natural calamity warns human beings to be alert about their future. Man has come to realize the unstable nature of his existence that he is living in very border line and future life on the earth will depend on the well being of the planet. Atwood become success to web the threat of the present time and how need of human being to be careful about their future and the future of the world.

Modern science and technology is the another threat for the environmental apocalypticism. In modern time two Great World War and holocaust happened in the world which destroyed the massive lives of the people as well as species. To get the power human being started doing any action against nature because of that present world has been facing the problem like climate change, ozone depletion, loss of biological diversity, fresh water scarcity, ocean acidification and cataclysmic deforestation, which are the representative horrors of present time which create the apocalypses in the earth.

It is common consensus that the nature does not remain always the same. The nature evolves constantly. Nature adopts the traits from the neighboring organisms adjusting itself as per the change in the climate. However, genetic engineering alters the natural evolution process by imposing the traits as per the "need" of the corporate world. As genetic engineering enables the geneticists in modifying the animals in no

time, there is dramatic reverse in ecology. This very sudden change might be apocalyptic, and may put an end to the human world along with the non human world.

Saving nature depends on human's harmonious relationship with nature. Co-participation and integration, bond between human and non human species, and the strong sense of bioethics are essential elements of preserving human and natural environment.

Genetic engineering, if used for the welfare of human and non- human living things equally, supporters in preserving ecological diversity. Otherwise, genetic engineering, in the hand of global economy, would be apocalyptic.

The link between environmental literature and ecological ethics have been established. The need of further research on the field of genetic engineering is more demanding in the present time. Limiting the research on GMOs on its being "natural" or "unnatural" curtails the role of global economy in its expansion. So, the researcher believes, this research helps in understanding the role of global economy in encouraging genetic engineering technology that has been the greatest threat to global biodiversity. As the research was limited in the study of genetic engineering and its effects on ecology, further line of research would be ecolinguistic reading of the texts and the study on the role of environmental apocalypticism and dystopian literature.

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