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Scientific Progress and World's Apocalypse: Visions of Doom in Carson's *Silent Spring*

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Letter of Recommendation

The thesis entitled “Scientific Progress and World’s Apocalypse: Visions of Doom in Carson’s *Silent Spring*”by Krishna Prasad Nepal has been accomplished under my supervision. I recommend this finalized version for the viva voce.

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Abstract

The study of Rachel Carson's *Spring Silent* investigates the contention she shows in the text and verifies her concern and advocacy for the banning of harmful chemicals by replacing safer methods to kill crabgrass and other insects which affect crops and other plants badly. The project applies ecocriticism as a theoretical tool to look into the issue and to strengthen the advocacy for preservation of the earth from environmental degradation. The research critiques of the heinous endeavors of the chemical industries and medical sectors engaged in indiscriminately using chemicals for different purposes without having due attention to their implications which may affect the coming generations. The Ecocriticism shows the relationship between human beings and their environment and how they interact with each other is the concern of the ecocritics. The study consents on the alternatives as posed in Carson's *Spring Silent* and stresses on the search for alternatives to harmful chemicals.

The problem caused by the excessive use of pesticides in the fields and in different other aspects of life lessens the longevity of living creatures. It decreases the possibility of better life as well. This research can awaken those who are still negligent towards the nature and her properties which are directly connected to humanity and other creatures. The study shall help the policy makers to formulate policies for the preservation of environment. The study has adopted eco-criticism as a theoretical tool to analyze the text to justify the research.

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I. Introduction: Science and Environment

This project on Rachel Carson's *Silent Spring* exposes the problem with widespread pesticide as it endangers both humanity and wilderness. It explores an irresponsible chemical industry that constantly claims that pesticide does not harm any consumers of the edibles. Carson provides the biotic approach that refers to the life-saving act of creatures which is cheaper, safer, and longer as a natural solution to problems caused by pesticides. This research investigates the effect of pesticides and other harmful chemicals used for the growth of edibles. On the one hand the project highlights the massive use of chemical which badly affect the eco-system and on the other the researcher poses the contradiction prevails between the technological advancement and the natural habitat of life which means the life influenced by technology stands against the wilderness.

The study highlights on relationship between human beings and natural resources which sometimes are found colliding against each other. The research does not only assume that pesticides and use of DDT's disaster in earth but also presumes how we can prevent the chemical and poisonous effect on environment. The ecological and public health problem is the trigger of other problems. The research poses the possibilities of reformulating human efforts by interrogating that in our over-organized and over-mechanized age, individual initiative and courage still count: change can be brought about, not through incitement to war or violent revolution, by altering the direction of our thinking about the world we live in. The preservation of nature ensures the longevity of living in peaceful and progressive manner in the earth.

Ecocriticism is the theory that applies to see Carson's *Spring Silent* which advocates the application and adoption of new methods to resolve problems instead of using chemicals that are harmful to the earth and her dependents.

There is a deep relationship between the ecology and human imagination. Human beings interact with the surrounding and the environment affects almost all aspects of life. The interconnectedness between living organisms and nature is noteworthy in order of looking at the literary work, Carson's *Spring Silent.* To read the text, ecocriticism is a theoretical framework that applies to seek into the issue of environmental degradation and its impact. In this regard, Lawrence Buell et al define:

> Ecocriticism begins from the conviction that the arts of imagination and the study thereof—by virtue of their grasp of the power of word, story, and image to reinforce, enliven, and direct environmental concern—can contribute significantly to the understanding of environmental problems: the multiple forms of ecodegradation that afflict planet Earth today. (418)

The basic concern of ecocriticism is the understanding of environmental problems. The ecosystem is degraded in myriad ways. To look into the issue of ecological imbalance, the application of ecocriticism is relevant as a theoretical tool.

There are a number of questions which emerge in mind. Why do people dig up the tunnel for their demise by degrading the environment which indeed helps survive in a healthy manner? Who are the responsible for different diseases because of depletion of the ozone layer? Why do human beings consume the contaminated water and breathe into polluted air? How can the situation of the current environmental problems be improved? What will the next generation think of us who are engaged in disturbing the ecological balance? These questions are the fundamentals of the research and the whole study investigates answers to these interrogations.

Quoting relevant text from Carson's *Spring Silent* and ecocritics' views regarding the environmental damage will be as the supporting details to justify the

thesis statement of the study. The deteriorating condition of the earth because of the over interference by the technologies in wilderness is the central issue that the study focuses on. The literature on the environmental degradation will be sufficiently used to support the issue.

This project relies upon the ideas shared in ecocritical works such as *The Ecocritical Reader: Landmarks in Literary Ecology* edited by CheryllGlotfelty and Harold Fromm, and *Ecocriticism* by Greg Garrard. In *Introduction to The Ecocriticism Reader*, Glotfelty posing a question, what is ecocriticism? Defines ecocriticism as "the study of relationship between literature and the physical environment" and she explains: "just as feminist criticism examines language and literature from a gender-conscious perspective, and Marxist criticism brings an awareness of modes of production and economic class to its reading of texts, ecocriticism takes an earth-centered approach to literary studies" (xviii). Hence it becomes clear that ecocriticism is a mode of criticism which examines-how the text represents the physical world or it looks at how literature raises moral questions about human interaction with the nature.

Ecocriticism mainly concentrates on how literature interacts with the participants in the entire ecosphere. In the similar way, William Howarth's definition of ecocriticism hints towards the same idea:

> Ecocriticism is a name that implies more ecological literacy than its advocates now possess, unless they know what an embattled course ecology has run during its history [. . .] writings that depict the effects of culture upon nature, with a view toward celebrating nature, berating its despoilers and reversing their harm through political action. (69)

Glotfelty states that ecocritics and theorists ask questions like the following: "How is nature represented in this sonnet? What role does the physical setting play in the plot of

the novel? Are the values expressed in this play consistent with ecological wisdom? How do our metaphors of the land influence the way we treat it?" (xviii) Hence ecocriticism looks at the nature aspect in the text which examines the attitude of the author towards pervasive problem of toxic waste, ozone layer depletion, climate change, which has been a great challenge to the earth. It shows the interaction between human beings and environment which is like an unjust act imposed upon the nature by human beings.

Critiquing upon the present state of environmental problems, Glotfelty dismisses it by stating: "the environmental problems are largely of our own making, are, in other words, a by-product of culture" (xxi). To substantiate her statement, she invokes the historian Donald Worster who explains the crisis faced by modern human civilization claiming: "We are facing global crisis today, not because of how ecosystems function but rather because of how our impact on nature as precisely as possible" (xxi).

Ecocriticism is anxious about the way humans treat nature and its participants. It speculates on the long term consequences of human attitude towards nature. It is different from other critical approaches. Literary theory generally examines the relations between writers, text and the world. Ecocriticism expands the notion of "the world" to include entire ecosphere. It agrees with Barry Commoner's first law of ecology, "Everything is connected to everything else" (xix).

In this way, Glotfelty ventures on the writings that come in the domain of ecocritical work. As she says, "most ecocritical work shares a common motivation: the troubling awareness that we have reached the age of environmental limits, a time when the consequences of human actions are damaging the planet's basic life support systems" (xx). Moreover, she explains that ecocritical works advise us either to

"change our ways or we face global catastrophe, destroying much beauty and exterminating countless fellow species in our headlong race to apocalypse" (xx). Thus ecocriticism defines culture as a factor in the decline of the ecocriticism. It views that the culture plays a vital role in building consciousness and perception towards something. Culture makes up the person who we are. We think and act as we are brought up with. Lynn White, Jr. in "The Historical Roots of Our Ecological Crisis" argues in the similar line. He views on human's unnatural treatment of nature and its sad results. To him, the changes in human ways often affect nonhuman nature. According to him, Judeo-Christian teleology is the cause of ecological crisis. He accuses Christian anthropocentric view point as environment unfriendly religion which has positioned man over nature. Man as the master of the universe, can exploit nature in whatever way he likes. Man has got God's will to "exploit nature for his proper ends" (10). White brings forward the story of the creation of world from Genesis to substantiate his point:

> By gradual stages a loving and all powerful God has created light and darkness, the heavenly bodies, the earth and all its plants, animals, birds, and fishes. Finally, God had created Adam […]. Man named all the animals, thus establishing his dominance over them. God planned all of this explicitly for man's benefit and rule: no item in the physical creation had and purposes save to man's purposes. (9)

White argues, "We shall continue to have a worsening ecological crisis until we reject the Christian axiom that nature has no reason for existence save to serve man". And the solution of the ecological crisis, is adverse change in "orthodox Christian arrogance toward nature" (14), i.e. abandoning Christian anthropocentric view. He exemplifies his point by indicating the advent of automobile eliminated huge flocks of sparrows that

once fed on horse manure littering every street; the extinction of European aurochs as late as 1627 was due to overenthusiastic hunting; the invention of first cannons resulted in erosion and deforestation etc.

Likewise, William Rueckert has accused anthropocentric vision for the destruction of biosphere. He asserts: “All the creative processes of the biosphere, including the human ones, may well come to an end if we cannot find a way to determine the limits of human destruction and intrusion which the biosphere can tolerate, and learn how to creatively manage the biosphere” (112). For him, anthropocentric vision and “compulsion to conquer, humanize, domesticate, violate, and exploit every natural thing” is man’s tragic flaw that causes the decline of the ecosystem. It is the problem that is “not national but global, planetary”. He cites Arthur Boughey’s idea to strengthen his point: “There is no population, community, or ecosystem left on earth completely independent of the effects of human cultural behavior. Now [this human] influence has begun to spread beyond the globe to the rest of our planetary system and even to the universe itself” (114). To resolve the ecological problems, to promote an ecological vision is necessary.

Harold Fromm in “From Transcendence to Obsolescence: A Route Map” speculates on “how the industrial revolution affected humanity’s conception of its relationship to nature, allowing us to forget that our “unconquerable minds” are vitally dependent upon natural support systems” (xxvii). As he thinks, modern men are so mechanical that they no longer have reverence towards nature. They are surrounded by modern technologies in every step of their life which make forget what nature and natural is. Similarly Sueellen Campbell in “The Land and Language of Desire: Where Deep Ecology and Post-structuralism Meet” says that ecological theory criticizes the traditional sense of a separate, independent, authoritative center of value or meaning

and substitutes the idea of networks i.e. each living and non-living organism in the ecosphere is embedded to each other. They are the constituents of the same system or networks. And one's action has direct or indirect impact to other. If one fails to function the whole system can be destroyed. To support her point, she refers to Fritjof Capra's idea that the world is "a complicated web of relations between the various parts of the whole" (71).

As Susie O'Brien has expressed, ecocriticism as such, despite (orbecause of) its globalizing impetus, is an American invention. On the other, theexistence of a rich ecocritical tradition in Canada, which is in turn radically linkedto the national, cannot be underestimated or denied: "By exploring this conjunctionin a comparative framework," O'Brien argues, "it is possible to consider notjust why some nationalist mythologies nurture ecocritical thinking more effectivelythan others, but also how the principles of ecocriticism might be adapted toreflect the importance of cultural context" (18-19). Brien associates the role of ecocriticism with that of the culture of a particular nation.

As the postmodern critic and theorist Linda Hutcheon convincingly explains, "[p]ostmodern discourses assert both autonomy and worldliness" (46). The role of postmodernism in the discourse of material ecocriticism, therefore, deserves a closer consideration. Postmodernism acknowledges the problematic interrelations between the ontological and the epistemological with a critical self-reflection. The existence of living creatures and the way of knowing the world around is the subject of criticism. In so doing, it draws attention to the constitutive engagement of human discursive systems with the material world, at the same time reflecting upon the complicity between our discursive formulations and the material world.

This research draws ideas from the mentioned theoretical discussion to affirm that Carson's *Silent Spring* poses a scene of disastrous effect of pesticides in the world of living creatures. In the similar vein, Greg Garrard in his *Ecocriticism* insists that "apocalyptic narratives" inflects much environmentalism today. To him, environmental and radical ecological discourse, often employ apocalyptic narrative to prophesize cataclysm. Likewise, Lawrence Buell in *The Environmental Imagination: Thoreau, Nature Writing and the Formation of American Culture*, argues that "Apocalypse is the single most powerful master metaphor that the contemporary imagination has at its disposal" (285). Thus apocalyptic rhetoric found to be massively used in several most influential books in the environmentalist canon which includes Rachel Carson's *Silent Spring* and Paul Ehrlich's *The Population Bomb*.

Rachel Carson's *Silent Spring* exposes all kinds of potential disasters, some humans are severe than others. Carson reveals more aesthetic kind of disaster that wipes out the beauty of nature. Using the excuse of traffic control and safety, the practice of spraying weeds within herbicide along all the country's roadside and highways are some of the evidence which are lurking to shallow the beauty of nature. Drawing upon an environmental consciousness, Carson discerns in American culture. She opposes human beings who have attempted and attempt to use technology to dominate nature and help transform it to a sweeping social movement that impacts almost every aspect of everyday life.

The first chapter of the study deals with the research questions in the light of the thesis statement. The life of living creatures is affected by the existing phenomena which ensure the longevity and preservation of nature. A short introduction to the theoretical tool along with the relevant literature on the issue is presented. Similarly the second chapter analyzes the literary text, Carson's *Spring Silent* and to support the

issue, critics' readings are quoted for the purpose. This chapter justifies the hypothesis by answering the research questions with adequate supporting details. The efforts to preserve nature and her entities is the liability and obligation of humanity for the balance in the ecosystem. Likewise, the third chapter summarizes the whole reading with special focus on the findings and the researcher's reflections. In this way, the works cited consists of references by acknowledging the original writers with due respect.

2. Scientific Progress as the Cause of Environmental Apocalypse in *Silent Spring*

The project seeks answers to why people yield the ground their demise by interfering with nature and her entities which are crucial in order of strengthening and prolonging the life journey. Human beings are sometimes shortsighted and can see only the temporal benefits which tempt them to interfere with nature and dig up the graves for themselves by affecting the wilderness in negative ways. Consequently, they face disaster and degeneration. Whether we human beings are responsible for the disaster and decadence in the environment is the focus of the study. The depletion of the ozone layer and massive use of poisonous chemicals affect organisms in multiple manners. Is it good to lead a life in the polluted world that indeed shadows the face of the era? What might be the means and techniques to improve the deteriorating scenario of the vegetation? Do we not have any responsibility of preserving the environment that is the base of our survival? These curiosities seek answers through the reading to Carson's *Spring Silent*.

Science is a multi-layered complex system involving a community of scientists engaged in research using scientific methods in order to produce new knowledge. Thus, the notion of science may refer to a social institution, the researchers, the research process, the method of inquiry, and scientific knowledge. The concept of progress can be defined relative to each of these aspects of science. Hence, different types of progress can be distinguished relative to science: economical, professional, educational, methodical, and cognitive. These types of progress have to be conceptually distinguished from advances in other human activities, even though it may turn out that scientific progress has at least some factual connections with technological progress and social progress.

Science is a powerful way of knowing that has transformed the relationship between human society and the natural world. Science refers to information gathered using the scientific method, a systematic approach to gathering empirical data and determining facts about nature or society. A scientific approach to studying the natural or social world asks clear, specific questions, makes predictions, tests the accuracy of those predictions, and draws conclusions based on measurable evidence.

Environmental degradation and loss of ecosystem services directly affect pests, soil erosion and nutrient depletion, growing conditions through climate and weather, as well as available water for irrigation through impacts on rainfall and ground and surface water. A changing climate affects evapo-transpiration, rainfall, river flow, toughness to grazing, insects, pathogens and risk of invasions, to mention a few.

The project poses the scene of the deteriorating condition of the global caused by the massive use of DDT. Carson asserts:

> While working for the government, she and her scientific colleagues had become alarmed by the widespread use of DDT and other long-lasting poisons in so-called agricultural control programs. Immediately after the war, when these dangers had already been recognized, she had tried in vain to interest some magazine in an article on the subject. A decade later, when the spraying of pesticides and herbicides (some of them many times as toxic as DDT) was causing wholesale destruction of wildlife and its habitat, and clearly endangering human life, she decided she had to speak out. (Foreword)

The widespread impact of DDT has been the matter of concern to every concerned one because of the problems it causes. It badly damages the life of the whole vegetation and beautiful world that needs to remain unaffected by the chemicals which are heinous.

Carson's point helps to strengthen the thesis:

> And *Silent Spring* will continue to remind us that in our overorganized and overmechanized age, individual initiative and courage still count: change can be brought about, not through incitement to war or violent revolution, but rather by altering the direction of our thinking about the world we live in.(Foreword)

The mentioned extract exposes the impact of mechanization and systemization as it lessens the human efforts but damages the possibilities of growth and sustainability of the whole eco-system. Carson perceives changes in positive manner but with reservation that change should not be to dig the grave for human beings and other fellow creatures. She prefers constructive change rather than destructive one. Because of destructive deeds of the modern people, life itself is likely to extinct sooner or later. In this fashion, the author speaks:

> There was a strange stillness. The birds, for example—where had they gone? Many people spoke of them, puzzled and disturbed. The feeding stations in the backyards were deserted. The few birds seen anywhere were moribund; they trembled violently and could not fly. It was a spring without voices. On the mornings that had once throbbed with the dawn chorus of robins, catbirds, doves, jays, wrens, and scores of other bird voices there was now no sound; only silence lay over the fields and woods and marsh. (2)

The bewilderment in every aspect of the panorama heightens the intensity of destruction and creates hopelessness everywhere. It is the indication of apocalypse on the part of both human and animal kingdom. Human beings destroy nature in different ways. They interfere with the natural panorama and eventually its beauty. They pollute

air; contaminate resources of water such as sea, rivers, ponds, streams, canals etc for their vested interests. They hardly think of the implications of their misdeeds. In this regard, Carson notes:

> The most alarming of all man's assaults upon the environment is the contamination of air, earth, rivers, and sea with dangerous and even lethal materials. This pollution is for the most part irrecoverable; the chain of evil it initiates not only in the world that must support life but in living tissues is for the most part irreversible. In this now universal contamination of the environment, chemicals are the sinister and little-recognized partners of radiation in changing the very nature of the world—the very nature of its life. (4)

There is direct interconnectedness between the ozone layer and the carbon-dioxide we produce to meet the requirement of the industries, and factories. The whole ecosystem is disturbed with the immature and indecisive acts of human beings. The cyclic relationship among both tiny and big creatures in their respective places can be of great value. The advancement of science and technology seems to have been enhancing the growth of agricultural products. However, the human efforts for hike in productivity turned negative and unexpected. Carson mentions:

> These sprays, dusts, and aerosols are now applied almost universally to farms, gardens, forests, and homes—nonselective chemicals that have the power to kill every insect, the 'good' and the 'bad', to still the song of birds and the leaping of fish in the streams, to coat the leaves with a deadly film, and to linger on in soil—all this though the intended target may be only a few weeds or insects. (5)

The farmers use different types of pesticides in their farms, gardens, forests and homes to kill the insects which to some extent good but to a larger extent turn fatal to themselves as they are nonselective chemicals and their poison penetrates food items which people consume. Very indiscriminately the insects lose their lives, among which at least few of them are contributing to the proper functioning of the whole ecosystem. In an interview, Paul Outka highlights the importance of ecosystem:

> It's just much more palatable to remove =overburden', than to lay waste to the heartbreakingly beautiful forests and mountains of West Virginia, and all the wild creatures that live there, in the blind profit-driven pursuit of an environmentally disastrous fuel that is cooking the planet. But the latter strikes me as a much more accurate description—and ecocriticism sees environmental struggle as profoundly connected to which description we choose. (12)

The extract is suggestive in the sense that Outka focuses on protection and reformation of the environment instead of polluting it. He finds human fellows engaged in ruining its beauty by spreading waste everywhere. Writers like Virginia Woolf describes the organs of nature such as forests, mountains, rivers in order of reflecting on the tremendous beauty nature as a whole there is.

The project focuses on how different chemicals used invariably in the environment which ultimately cause disaster in almost every respect of living beings. In the similar fashion, Carson argues:

> DDT is now so universally used that in most minds the product takes on the harmless aspect of the familiar. Perhaps the myth of the harmlessness of DDT rests on the fact that one of its first uses was the wartime dusting of many thousands of soldiers, refugees, and prisoners,

> to combat lice. It is widely believed that since so many people came into extremely intimate contact with DDT and suffered no immediate ill effects the chemical must certainly be innocent of harm. This understandable misconception arises from the fact that—unlike other chlorinated hydrocarbons—DDT in powder form is not readily absorbed through the skin. Dissolved in oil, as it usually is, DDT is definitely toxic. (12)

DDT is widely used with the assumption that it is harmless. But Carson finds this belief system as a myth. On the real ground, DDT does affect the stability and sustainability of the peaceful environment. There is nothing as such if chemicals to use for killing insects can remain ineffective to the environment. If DDT is harmful to insects, of course it badly affects other living beings as well. Carson says, DDT is certainly toxic and therefore, it is harmful. Hence, the author challenges the strong belief of the people engaged in using DDT massively. Her concern is relevant as there are many ungrounded assumptions and misconceptions among the people and they generally take the help of strengthening their argument. Very evidently, Carson poses the comparison between Endrin and DDT and thus states:

> Endrin is the most toxic of all the chlorinated hydrocarbons. Although chemically rather closely related to dieldrin, a little twist in its molecular structure makes it 5 times as poisonous. It makes the progenitor of all this group of insecticides, DDT, seem by comparison almost harmless. It is 15 times as poisonous as DDT to mammals, 30 times as poisonous to fish, and about 300 times as poisonous to some birds. (15)

No doubt, DDT is comparatively harmless but not harmless completely. When it is compared with Endrin, the most toxic of all the chlorinated hydrocarbons, DDT may

prove better than the rest of the chemicals. The degree of harm it causes to mammals, fishes, and birds is evident to challenge the faith in DDT.

Dana Phillips in *Ecocriticism, Literary Theory, and the Truth of Ecology* argues:

> "The wilderness of signs" is a metaphor with which many theorists would be perfectly comfortable. Ecocritics ought to be less comfortable with such a metaphor, but they like to treat literary, ecological, and environmental concepts vaguely similar in their rough outlines as if they were exactly the same in their details. Thus the complexity of language, poetic language in particular, is seen as expressive of or even determined by the complexity of nature. Ecocritical analysis of literary texts then proceeds haphazardly, by means of fuzzy concepts fashioned out of borrowed terms: words like "ecosystem," "organism," and "wilderness" are used metaphorically, with no acknowledgment of their metaphorical status, as if literary, ecological, and environmental ways of speaking were a lot more compatible than they are, and as if their differences could safely be overlooked. (580)

Phillips claims that organism, wilderness, and ecosystem are synonymous. If they are same, problems start when some harm is caused in the forest, environment, and our surrounding. This harm causes the imbalance of the whole ecosystem. Organism refers to the relationship between parts and whole. When a part is disturbed, the whole gets automatically affected. Every visible and invisible entity is relevant and indispensable for the holistic sustainability. Despite some differences among the words in their implications, the essence is the same. Phillips's commentary upon the interconnectedness among the living organisms sounds relevant in this regard. The research moves around the literary text of Carson in which she says:

> The legend that the herbicides are toxic only to plants and so pose no threat to animal life has been widely disseminated, but unfortunately it is not true. The plant killers include a large variety of chemicals that act on animal tissue as well as on vegetation. They vary greatly in their action on the organism. Some are general poisons, some are powerful stimulants of metabolism, causing a fatal rise in body temperature. . .The herbicides, then, like the insecticides, include some very dangerous chemicals, and their careless use in the belief that they are 'safe' can have disastrous results. (20-21)

Carson undercuts the illusion of people who use herbicides as toxic and claim that they are harmful to only plants and do not harm animals anymore. She terms it as a legend based on the practice of handing down a belief from generation to generation. Her point is when everything is interconnected in this universe, how one thing is harmed, and the rest can remain untouched and unaffected. There is organic relationship among the living and non-living entities; one thing depends upon the sustainability of others. Carson unveils this confusion that herbicides are safe. Moreover, she warns the use of herbicides may result into disaster.

Carson does not discard the contamination of water caused by pesticides and she adds it can be understood in the context, as a part of the whole. She says in this regard:

> The problem of water pollution by pesticides can be understood only in context, as part of the whole to which it belongs—the pollution of the total environment of mankind. The pollution entering our waterways comes from many sources: radioactive wastes from reactors,

> laboratories, and hospitals; fallout from nuclear explosions; domestic wastes from cities and towns; chemical wastes from factories. (22)

There are different sources of pollution which mingle with resources of water. Rivers, ponds, canals and seas do not get polluted directly by pesticides but they are used in laboratories, and hospitals and the wastes from these places come to resources of water which either we consume or animals and insects of the resources we depend upon for survival. After all, humankind is terribly affected by the presence and use of pesticides.

How DDT affects the biophysics of the creatures is the matter of notice. Carson expresses her concern with a measuring standard:

> The physiological effect of DDT is probably unique among insecticides, for it destroys part of the adrenal gland— the cells of the outer layer known as the adrenal cortex, which secretes the hormone cortin. This destructive effect, known since 1948, was at first believed to be confined to dogs, because it was not revealed in such experimental animals as monkeys, rats, or rabbits. (28)

DDT destroys the part of the adrenal gland and this destructive effect of the chemicals used in farms with different purposes for protection of plants. How the environment is destroyed for the sake of very temporary interests of humanity is the crucial aspect of the study. Carson's endeavor to present the data in order of supporting the thesis of the research is significant.

JelicaTošić in *Ecocriticism – Interdisciplinary Study of Literature and Environment* defines what ecology is and how it is connected to the human beings:

> Eco is short of ecology, which is concernedwith the relationships between living organisms in their natural environment aswell as their relationships with that environment. By analogy, ecocriticism is

> concernedwith the relationships between literature and environment or how man's relationships withhis physical environment are reflected in literature. (44)

There is a commendable relationship between environment and literature. The issues literary texts embody for the setting and other thematic aspects are based on the environment. Literature reflects what and how human beings are connected with the rest of organism. After all, human beings are the part of the whole ecosystem. Their deeds obviously affect the implications of the phenomena. Ecocriticism investigates the relationship between literature and environment as both of them are interdependent and interrelated. Tošić further argues:

> Habitat modification is another important cause of extinction. The changed attitude towards soil involving the greater use of herbicides and pesticides has contributed to theextinction of numerous species or to reduce biodiversity. . . At the biological and ecological level, these facts have led to the attempt at preserving the endangered species and establishing the protected areas. This is, however, not enough. Action must be much broader and the whole society and all the individualsmust be changed. (48)

The extinction of many significant species and plants is because of the optimal use of pesticides and other fatal chemicals. Such chemicals do not only affect the plants but also other living organisms including human beings. The life of humanity is endangered because of the carelessness and vested interests of the people for the time being. To twist the pace of making efforts for changing the scenario of destruction, actions need to be taken for the sustainability of life in general and human life in particular.

Carson argues in the same fashion:

> The earth's vegetation is part of a web of life in which there are intimate and essential relations between plants and the earth, between plants and other plants, between plants and animals. Sometimes we have no choice but to disturb these relationships, but we should do so thoughtfully, with full awareness that what we do may have consequences remote in time and place. But no such humility marks the booming 'weed killer' business of the present day, in which soaring sales and expanding uses mark the production of plant-killing chemicals. (35**)**

The earth is our mother and her preservation is the responsibility of all living creatures. Human beings are conscious and therefore, they are more responsible than others. With this assumption, Carson's views regarding the interconnectedness among the plants, animals and human beings are vibrant and cordial.

There is a high demand and sale of chemical crabgrass killers. To replace the chemicals for killing the crabs is a good alternative. The permanent solution is cheaper than the temporary one. Carson makes it clear with the evidence from the text:

> The booming sales of chemical crabgrass killers are another example of how readily unsound methods catch on. There is a cheaper and better way to remove crabgrass than to attempt year after year to kill it out with chemicals. . . Crabgrass exists only in an unhealthy lawn. It is a symptom, not a disease in itself. By providing a fertile soil and giving the desired grasses a good start, it is possible to create an environment in which crabgrass cannot grow, for it requires open space in which it can start from seed year after year. (45)

The presence of crabgrass in the unhealthy lawn is not a problem but a symptom. If the lawn is cleaned, the crabgrass will disappear. This technique can help solve the problem permanently. To better the environment is the need of the time as it affects the life of every living being in a positive manner.

In this way, Carson complains against other misdeeds committed by fellow beings. She says: “Spraying is killing the birds but it is not saving the elms. The illusion that salvation of the elms lies at the end of a spray nozzle is a dangerous will-o’-the-wisp that is leading one community after another into a morass of heavy expenditures, without producing lasting results” (63). The presence of birds in their natural habitat beautifies the whole ecosystem. How the spraying causes the mass destruction of innocent lives indiscriminately is the basic concern of the study. Carson critiques of the human curiosity and temptation along with their shortsightedness. People do not see the future generation and simply act out in accordance with their temporal interests.

Human behaviors and deeds destroy the entire phenomenon which ultimately results into ecological crisis. Hannes Bergthaller et al (2014) in *Mapping Common Ground: Ecocriticism, Environmental History, and the Environmental Humanities* demonstrate the cause and effect relationship between ecological crisis and cultural and social environment:

> Clearly, the ecological crisis is not only a crisis of the physical environment but also a crisis of the cultural and social environment—of the systems of representation and of the institutional structures through which contemporary society understands and responds to environmental change (or fails to do so: hence the crisis). Many historians, literary critics, and philosophers have explored these issues. (263)

The cultural differences and social practices directly affect the ecology of that place. This interconnectedness is not a new issue. It has been raised from time to time. Critics' observation is acute and logical in the sense that culture and society makes it possible whether the environment changes or not.

Carson criticizes the habit of killing that has been growing. The life of birds is more vulnerable as they are being captured and killed from the aerial application of the poisons. She supports this issue:

> As the habit of killing grows—the resort to 'eradicating' any creature that may annoy or inconvenience us—birds are more and more finding themselves a direct target of poisons rather than an incidental one. There is a growing trend toward aerial applications of such deadly poisons as parathion to 'control' concentrations of birds distasteful to farmers. (70)

The farmers and birds co-exist but for the sake of temporary benefits, the innocent birds are getting killed. It is a bad step and illogical act of humanity that it is interfering in the world of wilderness. The values of existence in reciprocal manner are being destroyed. The emergence of environmental crisis lays its ground on the irresponsible acts of human creatures. Likewise, Carson analyzes the situation influenced by the illogical deeds of human beings:

> The pesticide threat to fishes may be divided into three parts. One, as we have seen, relates to the fishes of running streams in northern forests and to the single problem of forest spraying. It is confined almost entirely to the effects of DDT. Another is vast, sprawling, and diffuse, for it concerns the many different kinds of fishes—bass, sunfish, trappies, suckers, and others that inhabit many kinds of waters, still or flowing, in

> many parts of the country. . . although a few principal offenders like endrin, toxaphene, dieldrin, and heptachlor can easily be picked out. (77)

The oceanic world or the world of waters is terribly affected. Sea creatures such as fishes—bass, sunfish, trappies, suckers, and others lose their lives because of poisonous chemicals such as endrin, toxaphene, dieldrin and heptachlor. Such chemicals indiscriminately take away the innocent lives which eventually dismantles the balance among natural entities. Carson does not leave any area of nature untouched. To support her argument, she brings about the issue of the forest life as well. She narrates her experience:

> What would happen to wildlife as a result of the insecticide used against the ants was another matter. The chemicals to be used were dieldrin and heptachlor, both relatively new. There was little experience of field use for either, and no one knew what their effects would be on wild birds, fishes, or mammals when applied on a massive scale. It was known, however, that both poisons were many times more toxic than DDT, which had been used by that time for approximately a decade, and had killed some birds and many fish even at a rate of 1 pound per acre. (91)

Massive use of insecticides to kill ants is a serious issue. In addition, wild birds, fishes, or mammals do become the victims of the insecticides. Irrationality lies in the decisions about the spraying the insecticides targeting insects such as ants. Simultaneously it harms other creatures as well. But the users seem reluctant to pay equal attention to the probable problems.

There are many animals and other innocent creatures which are victimized in the process of satisfying human curiosity through experimentation upon them and by caging them in a closed world wherein they do not enjoy their natural habitat. Carson

sympathizes with their lives and opposes the use of DDT sprayed on lettuce that we consume. The consumption of green vegetables grown with the help of the chemical lessens our life tenure. In this regard, Carson states:

> A laboratory animal, living under controlled and highly artificial conditions, consuming a given amount of a specific chemical, is very different from a human being whose exposures to pesticides are not only multiple but for the most part unknown, unmeasurable, and uncontrollable. Even if 7 parts per million of DDT on the lettuce in his luncheon salad were 'safe', the meal includes other foods, each with allowable residues, and the pesticides on his food are, as we have seen, only a part, and possibly a small part, of his total exposure. This piling up of chemicals from many different sources creates a total exposure that cannot be measured. It is meaningless, therefore, to talk about the 'safety' of any specific amount of residue. (101)

The beautiful wilderness and originality of the food items we consume are lost and instead artificial process of growth is made possible to meet the demand in larger quantities. The whole problem of pesticide poisoning is enormously complicated by the fact that a human being, unlike a laboratory animal living under rigidly controlled conditions, is never exposed to one chemical alone. Between the major groups of insecticides, and between them and other chemicals, there are interactions that have serious potentials. Carson further clarifies: "Whether released into soil or water or a man's blood, these unrelated chemicals do not remain segregated; there are mysterious and unseen changes by which one alters the power of another for harm" (107). Nothing remains untouched and unaffected by the aggravated impact of poisonous chemicals. Ecocriticism is concerned with locating entities in space, time and social context

relative to physical space. From an ecocritical perspective, learning and writing landscape becomes a way of mapping cultural terrain. Ecocriticism explores how metaphors of nature are used and abused across a range of literary and non-literary texts. No doubt, one life is connected with the life of other organisms. Living creatures do lose their potentials for normal sustainability as well. Carson justifies this case:

> The living cell assaulted by radiation suffers a variety of injuries: its ability to divide normally may be destroyed, it may suffer changes in chromosome structure, or the genes, carriers of hereditary material, may undergo those sudden changes known as mutations, which cause them to produce new characteristics in succeeding generations. (115)

The impact of our deeds will fall on the coming generations as well. The genetic transmission will be in effect. The characteristics of the preceding creatures will transmit to the next which implies the disaster in the whole universe. It applies to all the creatures. Nothing can remain aloof as everything is interconnected.

Cheryll Glotfelty in *The Ecocricitism Reader: Landmarks in Literary Ecology* asserts that: “most ecocritical work shares a common motivation: the troubling awareness that we have reached the age of environmental limits, a time when the consequences of human actions are damaging the planet’s basic life support systems” (xx). She clarifies the bitter fact and opinions on human actions. She urges human beings to take immediate actions upon the problems created by their domineering attitude: i.e. to change their ways of life or face “global catastrophe, destroying much beauty and exterminating countless fellow species in our headlong race to apocalypse” (xx). As Lynn White in “The Historical Roots of Our Ecological Crisis” argues that the advent of the automobile resulted in extinction of “sparrows that once fed on the horse

manure littering every street" (4). In the same fashion, Carson's portrayal of the extinction corresponds with White's idea. She speaks:

> With the advent of man the situation began to change, for man, alone of all forms of life, can create cancer-producing substances, which in medical terminology are called carcinogens. A few man-made carcinogens have been part of the environment for centuries. . .Instead of the natural environment there was rapidly substituted an artificial one composed of new chemical and physical agents, many of them possessing powerful capacities for inducing biologic change. . . As a result these powerful substances could easily penetrate the inadequate defenses of the body. (120-121)

Even the medical sector is terribly affected by the advent of chemical productions. The artificial chemicals cause the destroying tenets. These human made substances weaken human anatomies. Environmental diseases related to the use of various toxic substances have been increasing, 'particularly during the past ten years', Dr. Hargraves believes. From extensive clinical experience he believes that "the vast majority of patients suffering from the blood dyscrasias and lymphoid diseases have a significant history of exposure to the various hydrocarbons which in turn includes most of the pesticides of today. A careful medical history will almost invariably establish such a relationship" (125). The proliferation of cancer-producing chemicals is undoubtedly affecting the whole phenomenon and therefore, human competencies that need to be for good reasons turn to be harmful to the environment.

Carson questions human beings' exposures:

> Human exposures to cancer-producing chemicals (including pesticides) are uncontrolled and they are multiple. An individual may have many

> different exposures to the same chemical. Arsenic is an example. It exists in the environment of every individual in many different guises: as an air pollutant, a contaminant of water, a pesticide residue on food, in medicines, cosmetics, wood preservatives, or as a coloring agent in paints and inks. (131-32)

Contamination of water and presence of pesticides in food, medicines, detergents and so on are the questionable aspects. Carson points out: “Water pollution experts throughout the United States are concerned by the fact that detergents are now a troublesome and practically universal contaminant of public water supplies. There is no practical way to remove them by treatment” (132). All creatures are not equal in even in their natural habitat. Spraying of chemicals kills off the weak but innocent creatures. Though every creature has the right to survive freely without any external interference, the human beings do not let them survive so as to fulfill their temporary needs. Carson expresses her resentment against such disastrous efforts:

> Spraying kills off the weaklings. The only survivors are insects that have some inherent quality that allows them to escape harm. These are the parents of the new generation, which, by simple inheritance, possesses all the qualities of ‘toughness’ inherent in its forebears. Inevitably it follows that intensive spraying with powerful chemicals only makes worse the problem it is designed to solve. After a few generations, instead of a mixed population of strong and weak insects, there results a population consisting entirely of tough, resistant strains. (151)

The survivors of the current time will carry on the diseases and these harms will turn terrible to the forthcoming generations. Thus the life of the present is connected with that of the future. The seriousness and certain actions if not taken timely, it would result

into damaging and weakening the potentials of the forthcoming successors. Ecocriticism works against the alienation of humans from nature. Ecocritics argues that there is no such thing as an individual, only an individual in context; no self, only a self in place.

Carson has learned about the problems of pesticides. Unworried by the chemical companies' hostility and by the public's high enthusiasm for pesticides, she has written *Silent Spring*, which has caused a major shift in public consciousness about the environment.

Carson has explored that the mid-20th-century boom of scientific and technological discoveries created a new society of consumers drunk with the power of instant gratification. The idea that life could become easier prevented many from seeing problems with advances in convenience, particularly any potentially negative effects on the earth or even on future generations. She has seen problems and therefore, cautions restraint.

In all of her writing, Carson focuses on a central theme—that, unlike animals, humans have the capacity to drastically alter nature. She also believes that humans, if they take the time, can learn from nature. She writes: “It is a wholesome and necessary thing for us to turn again to the earth and in the contemplation of her beauties to know of wonder and humility,” (8). This belief has gone up as she has tackled a new facet of conservation: the use of pesticides.

Carson has become increasingly troubled by the indiscriminate use of pesticides, particularly dichloro-diphenyl-trichloroethane (DDT), which became popular during World War II. First used on wartime soldiers to get rid of lice and thus reduce the spread of typhus, DDT caused no immediate side effects, so it is widely assumed the pesticide will not affect humans or wildlife. Carson believes otherwise and

indeed this pesticide is soon blamed for the decreasing bald eagle population. According to the U.S. Fish and Wildlife Service, DDT residue has begun to contaminate lakes and streams, thus harming the eagles' food and disturbing the reproduction process.

Carson herself does not advocate a complete ban on pesticides. She qualifies that chemical insecticides must never be used. She says that we have put poisonous and biologically forceful chemicals indiscriminately into the hands of persons largely or wholly ignorant of their potentials for harm. We have subjected enormous numbers of people to contact with these poisons, without their consent and often without their knowledge. She objects this kind of endeavor.

This research work agrees on the facts Carson has explored and has presented in her writings. The researcher envisions environmental degradation as a major effect because of the massive use of DDT and other pesticides. On one hand, people produce vegetables for the sophisticated survival. On the other, the effect of the chemicals used for quantifying the amount of the production and enhancing the production quality is just opposite the human intention. The research locates the problem with the contradiction between human deeds and their intentions.

The whole write-up is the critique of relationship between the scientific advancement and its impact upon the environment that directly affects human life along with the life of those creatures which are directly or indirectly connected with human beings. Science in the guise of upgrading quality of life pushes the life towards the destruction of life itself. Carson's *Spring Silent* is the critical reading of the relationship between science and environment.

The latest advancement in the domain of science and technology stands against the spirit of nature as the latter is the pure and life-friendly. The optimal use and

dependency upon human creation for the vested interests causes the destruction of the natural phenomena which ultimately leads life towards the complete ruin. On one hand human beings express pride in having tremendous capacity to manipulate the nature and her properties, on the other they dig up their graves by lessening the number of days of life. This foolishness of humanity is the subject of criticism. The study thus shows the negligence of humanity towards their liability towards the preservation of nature for longevity of life in the earth.

3. Apocalyptic Vision in Carson's *Silent Spring*

Ecocriticism as a literary theory exposes the interconnectedness and essential relationship between human and natural world through the literary work. Ecocriticism puts all the organism of the biosphere in the same foot rather than in a hierarchical position. It gives equal importance to nature and human beings and views how the existence of one is dependent upon other. It views that if the chain is broken the whole system as a whole will be dismantled; it will ensure the apocalypse. Moreover, ecocriticism advocates for the biocentric world view.

Humans, like all organisms on Earth, interact with both the living and nonliving factors in their environment. Environmental degradation occurs when a potentially renewable resource-one of the biotic or abiotic factors humans need and use such as soil, grassland, forest, or wildlife is extracted at a rate faster than the resource can be replaced, and thus becomes depleted.

Loss of biodiversity is an important aspect of environmental degradation. Biologists agree that species are becoming extinct at an alarming rate. Biodiversity is also being lost at the ecosystem level due to environmental degradation. Tropical forests are recognized as the most diverse ecosystems on Earth and are experiencing the highest rate of ecosystem loss, but temperate habitats are also suffering degradation.

The quantitative loss of ecosystems is easy to measure. When a native prairie is converted to a cornfield or an open field is paved over to make a parking lot, the number of hectares can easily be calculated. Qualitative ecosystem degradation is harder to measure. The structure, function, or composition of an ecosystem can slowly change until the habitat is lost.

We human beings are responsible for degrading the environment. Ordinary human activity from even the most responsible individuals inevitably pollutes and

degrades the environment to some extent. We degrade the environment directly when we consume resources, and indirectly when we extract resources and transform them into products we need or want.

The population of the world increased fourfold in the twentieth century. This rapid increase in population was accompanied by an even more rapid increase in the use of resources to support the growing population and to raise living standards. Energy shortages have an even greater impact on developing nations that are heavily dependent on subsidized fuel supplies to maintain food production.

During the twentieth century, agriculturally productive land has been extensively modified to make it even more productive. This includes the widespread use during the twentieth century of chemical fertilizerspesticides, and extensive irrigation. In the twenty first century, competition for remaining land and water resources is expected to continue to increase.Modern agriculture has been able to produce an enormous amount of food. Intensive agriculture is able to produce more food per hectare, but increases the need for fresh water and chemicals for pesticides and fertilizer. Much of the rise in the food supply since 1950 has been due to greatly expanded irrigation and the use of pesticides and fertilizers.

Forests suffer similar pressures. Trees are harvested for timber and pulp. Land is cleared for agriculture. Mixed, old-growth forests are replaced with trees all of the same species planted at the same time. These forest monocultures suffer many of the same problems as food crop monocultures. They suffer from insect infestations and are much less stable than a diverse ecosystem. Grasslands have also been extensively modified and in many areas suffer desertification. As a consequence, there are significant losses of productivity in agricultural and forest lands from overcultivation, overgrazing, desertification, and deforestation around the world. The human population

is expected to continue to grow rapidly during the twenty-first century. As it does, many of the environmental resources on which humans depend are being degraded.

Environmental degradation affects everyone. International environmental concerns frequently focus on large-scale problems such as desertification or global warming. However, vulnerable groups, such as impoverished people living in marginal areas, are more concerned with local issues. They may worry about the loss of rangeland, soil erosion, or the need for more intensive farming. These and similar issues affect poor people because they are directly related to the household food supply and food security. Environmental degradation results in decreased production and lowered income.

Our environment is constantly changing. However, as our environment changes, so does the need to become increasingly aware of the problems that surround it. With a massive influx of natural disasters, warming and cooling periods, different types of weather patterns and much more, people need to be aware of what types of environmental problems our planet is facing. Our planet is warming up and we are definitely part of the problem. All across the world, people are facing a wealth of new and challenging environmental problems every day. Some of them are small and only affect a few ecosystems, but others are drastically changing the landscape of what we already know.

Current environmental problems make us vulnerable to disasters and tragedies, now and in the future. We are in a state of planetary emergency, with environmental problems piling up high around us. Unless we address the various issues prudently and seriously we are surely doomed for disaster.

Pollution of air, water and soil require millions of years to recoup. Industry and motor vehicle exhaust are the number one pollutants. Heavy metals, nitrates and plastic

are toxins responsible for pollution. While water pollution is caused by oil spill, acid rain, urban runoff; air pollution is caused by various gases and toxins released by industries and factories and combustion of fossil fuels; soil pollution is majorly caused by industrial waste that deprives soil from essential nutrients.

The population of the planet is reaching unsustainable levels as it faces shortage of resources like water, fuel and food. Population explosion in less developed and developing countries is straining the already scarce resources. Intensive agriculture practiced to produce food damages the environment through use of chemical fertilizer, pesticides and insecticides.

Human activity is leading to the extinction of species and habitats and loss of bio-diversity. Eco systems, which took millions of years to perfect, are in danger when any species population is decimating. Clean drinking water is becoming a rare commodity. Water is becoming an economic and political issue as the human population fights for this resource.

The current environmental problems pose a lot of risk to health of humans, and animals. Dirty water is the biggest health risk of the world and poses threat to the quality of life and public health.Genetically modified crops can cause serious environmental problems as an engineered gene may prove toxic to wildlife. Another drawback is that increased use of toxins to make insect resistant plant can cause resultant organisms to become resistant to antibiotics.

The need for change in our daily lives and the movements of our government is growing. Because so many different factors come into play; voting, governmental issues, the desire to stick to routine, many people don’t consider that what they do will affect future generations. If humans continue moving forward in such a harmful way towards the future, then there will be no future to consider. Although it’s true that we

cannot physically stop our ozone layer from thinning there are still so many things we can do to try and put a dent in what we already know.

Because of environmental degradation, the quality of human life has gone down. There have been a filthy number of diseases spread across the human world. Due to the extinction of the wild species, ecological hazards seem to be troubling and disturbing human beings. People are suffering skin cancer because of the depletion of the ozone layer and eye cataract has become a serious problem in the earth. In addition, the respiratory diseases are obvious and thousands of people are losing life untimely; they have lost their immune power and sperms as well. Productivity and reproduction have lowered.

Carson in *Spring Silent* shows multifarious problems caused by irresponsible activities and decisions of the modern humanity. DDT and other pesticides and insecticides are swarming the living creatures directly and indirectly in such a way that every organism will be badly affected. She shows certain possible ways as alternatives to eradicate diseases and kill unnecessary insects which disturb the human kingdom. For instance, crabgrass killing chemicals can be replaced with the clean lawn for permanent solution. She is reflecting on the disasters caused by human beings for their vested interests. To save the environment means to save the world and vegetation.

Human beings because of being engaged in temporal benefits, they interfere with the environment and their careless activities cause the degradation of the whole ecosystem. The thesis of the study is relevant in regard to Carson's views and observations. The preservation and protection of the ecology by respecting every organism can be made possible which enlivens and prolongs the life. Carson's reading and suggestions are fertile to be connected with this research.

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