

TO SPRAY OR NOT TO SPRAY WITH DDT TO CONTROL MALARIA: A CASE STUDY IN ENVIRONMENTAL ETHICS

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DECLARATION

I, the undersigned, hereby declare that the work contained in this assignment is my own original work that I have not previously in its entirety or in part submitted at any university for a degree.

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ABSTRACT

This assignment is devoted to an in depth analysis of the pro- and the contra-positions in the long-standing and costly debate about the question whether to spray with DDT or not in the fight against malaria. I argue that the dilemma whether or not to spray with DDT is born out of a political agenda, hype, exaggeration and misinformation of the first order.

Radical environmentalists appear to insist that DDT is a principal contributor of environmental degradation, and the major cause of death amongst wildlife and humans. Worse still, many Western people seem to be under the impression that mosquitoes cannot cause so much human misery as purported, and that malaria is caused by some kind of plant form of life, or even a virus.

The proponents of DDT, on the other hand, appear to be convinced that DDT is a saviour of humankind, and argue that the horrors associated with DDT are exaggerated and baseless, as they are not backed by scientific inquiry. Proponents of DDT also believe that anything that is overused may kill, even ordinary table salt.

In this assignment, both of these positions are scrutinized. On the basis of an historical overview in Chapter 1 of the history of the use of DDT, and the emergence of the debate about DDT in the wake of Rachel Carson's *Silent Spring* (1962), Chapter 2 is devoted to an evaluation of seven basic arguments against the use of DDT, while in Chapter 3 six arguments for the use of DDT are weighed. In Chapter 4 a resolution of the dilemma is proposed in which a case is made for a limited use of DDT only for indoor spraying of huts and houses against malaria mosquitoes until such time as a less dangerous alternative for DDT is found that can be used as effectively in the fight against malaria. As such, this case is informed by the strong moral conviction that we cannot allow poor people of colour to die because of a general ban on the use of DDT.

Further research on this ethical debate is encouraged.

ABSTRAK

Hierdie werkstuk is toegespits op 'n in-diepte analise van die pro- en kontra-posisies in die voortslepende, asook duur debat oor die gebruik van DDT al dan nie in die bekamping van Malaria. Ek argumenteer dat die dilemma rondom die vraag of DDT gebruik moet word of nie, aangewakker word deur politieke agendas, sensasie, oordrywing en foutiewe informasie van die eerste orde.

Radikale omgewingsgesindes dring oënskynlik daarop aan dat die gebruik van DDT 'n hoof-oorsaak is van die agteruitgang van die omgewing, asook 'n primêre oorsaak van dood onder wild en mense. Erger nog, dit wil voorkom of heelwat Westerse mense onder die indruk is dat muskiete nie werklik soveel menslike lyding kan veroorsaak as wat voorgegee word nie, en dat malaria eerder veroorsaak word deur 'n sekere soort plantvorm van lewe, of selfs deur 'n virus.

Die voorstanders van DDT, aan die ander kant, is klaarblyklik oortuig dat DDT 'n redder van die mensdom is, en argumenteer dat die gruwels wat geassosieer word met DDT 'n grondelose oordrywing is, aangesien dit nie deur wetenskaplike ondersoek gesteun word nie. Voorstanders van DDT glo verder dat enige stof wat in oormaat gebruik word, die dood kan veroorsaak, selfs gewone tafelsout.

In hierdie werkstuk word albei hierdie posisies krities bestudeer en bespreek. Op grond van 'n historiese oorsig in Hoofstuk 1 oor die gebruik van DDT, en die ontstaan van die debat oor DDT na aanleiding van Rachel Carson se *Silent Spring* (1962), word Hoofstuk 2 gewy aan 'n evaluasie van sewe basiese argumente teen die gebruik van DDT, terwyl in Hoofstuk 3 ses argumente vir die gebruik van DDT oorweeg word. In Hoofstuk 4 word 'n voorstel gemaak vir die resoluë van die dilemma deur 'n saak uit te maak vir die beperkte gebruik van DDT, nl. slegs vir binneshuise gebruik in hutte en huise teen malaria-muskiete tot tyd en wyl 'n minder gevaarlike alternatief vir DDT gevind word wat net so effektief sal wees in die stryd teen malaria. As sulks word hierdie studie gerugsteun deur die sterk morele oortuiging dat ons nie kan toelaat dat mense van kleur sterf as gevolg van 'n algemene verbod op die gebruik van DDT nie.

Verdere navorsing oor hierdie etiese debat word aangemoedig.

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TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION

1.1	Historical Background	7
1.2	Problem Statement	20
1.3	Methodology	29

CHAPTER 2 BASIC ARGUMENT AGAINST THE USE OF DDT

2.1	<i>Silent Spring</i> revisited	32
2.2	Wildlife and DDT	36
2.3	Human Health and DDT	37
2.4	Sustainable Development Argument	40
2.5	Autonomy of Nature	45
2.6	The Ecocentric Argument	48
2.7	Ecology Ethic Argument	49
2.8	Reverence for Being	51
2.9	Conclusion	54

CHAPTER 3 BASIC ARGUMENTS FOR THE USE OF DDT

3.1	The general social-political context of the DDT debate	57
3.2	Human Health and DDT	64
3.3	Wildlife and DDT	70
3.4	Rich Nations versus Poor Nations/ Nature versus Human Health Argument	73
3.5	Paul Taylor's Principle of Self Defence	76
3.6	DDT in a planetary-geological perspective	78
3.7	The Value of Autonomy	81
3.8	Conclusion	82

CHAPTER 4	SUGGESTED SOLUTION	
4.1	Scientific Research	84
4.2	Biological Control	95
4.3	Stewardship as a Solution	96
4.4	A Utilitarian Solution	96
4.5	Conclusion	98
CHAPTER 5	CONCLUSION	100
BIBLIOGRAPHY		105

LIST OF ACRONYMS

DDT dichlorodiphenyltrichloroethane

DDD-1 1 dichloro-2, 2bis (p-chlorophenyl) ethylene.

DDE dichloro-2, 2bis (p-chlorophenyl) ethylene.

EDF Environmental Defence Fund

EPA Environmental Protection Agency

NEPA Environmental Protection Policy Act

POPs Persistent organic pollutants

PCBs Polychlorinated biphenyls.

WHO World Health Organisation

WWF World Wildlife Fund for Nature.

Chapter 1

Introduction

1.1 Historical Background

When, in the late 1960s and early 1970s, states and the federal government of the United States began to restrict or ban the use of DDT (dichlorodiphenyl-trichloroethane), they did so because of the suspected effects of the chemical on the environment. Although there was some concern about its alleged carcinogenicity, human health was not a major part of the scientific case against DDT. In this respect DDT was quite different from earlier insecticides, which had been applied to agricultural areas and had their effects on human consumers. DDT was widely used in swamps, and other habitats where human involvement had been minimal. Its effects on the environment, however, were believed to be worldwide. The debate over DDT did not begin in this context, though. Almost all scientific discussion of the side effects of the new chemical centred on its impact on the human body, as medical scientists and regulatory officials attempted to fit it into the mould provided by experience with earlier insecticides (Dunlap 1981: 59). Between 1943, when the war time tests began and the mid-1950s, when a *modus vivendi* was worked out, there was a reply on the struggle over regulatory policy from the 1930s, a struggle in which, though some of the actors were different, the lines were much the same. The official debate over regulatory policy for DDT was, however, conditioned by a factor unique in the history of insecticides regulation: DDT was first used during World War II, by the time it entered the civilian market it already had a reputation for effectiveness, power, and safety unmatched by any other material (Dunlap 1981: 59).

DDT was first used on a large scale in the Naples typhus epidemic of 1943-1944 and during the rest of the war to protect millions of American soldiers and civilians against insect-borne diseases particularly typhus and mosquito transmitted malaria, and it came home after the war has ended in 1945 on a wave of publicity and high hopes, as a miracle chemical (Dunlap 1981: 1). At the time the Americans hailed this miracle chemical as an atomic bomb of the insecticides, ready to do a “Hiroshima” on

troublesome pests. It proved its effectiveness when it “miraculously” eliminated a typhus plague overnight. From there on, DDT was used generously by the Allies, not only in a military context, but also in civilian contexts, with the most beneficial consequences. After the war, DDT was used as a universal insecticide.

DDT, the weapon of choice, was then “dubbed the killer of killers, the harbinger of a new age” in insect control. Scientists predicted better and cheaper control of agricultural pests, the eradication of imported diseases. Then the world never paid attention to its devastating effects because “they saw fruits and vegetables with less insect damage, but perhaps the only time they thought of DDT was when they noticed the neighbourhood spray truck going into its rounds in the summer” (Dunlap 1981: 1).

By the late 1950s some scientists and citizens had become concerned about the death of birds from concentrated sprays used against the insect’s vector of Dutch elm disease, but most Americans ignored DDT until 1962, when Rachel Carson’s *Silent Spring* appeared. The book touched off a heated debate, for Carson, dissenting from the common view that DDT and similar compounds were harmless, vigorously attacked both the chemicals and the experts who recommended them. “It is not my contention” she wrote, “that chemical insecticides must never be used. I do contend that we have put poisonous and biologically potent chemicals indiscriminately into the hands of persons largely or wholly ignorant of their potentials for harm” (Carson 1962: 13). Rachel Carson, who was then a former wildlife biologist, then ignited a debate which later on put pressure on companies that made DDT, and other people – some scientists, some who leaped to defend DDT and to condemn Carson as a crank. The damage had already been done; President Kennedy asked his scientific advisors for a report and congress held hearings on federal regulations of pesticides. The *Silent Spring* surely changed the climate in which the policy on pesticides would be made. This culminated in the increase in public concern over the environment. The result was that DDT was banned in 1972 by the federal government of the USA.

However, what the public and policy makers did not understand was that Carson never really called for the banning of the pesticides, as she said, “it is not my contention that chemical insecticides must never be used”. She had noted with

approval an approach that combined a minimum use of insecticides combined with biological methods (Van Nostrand 1966: 12). Carson's book *Silent Spring* was trying to raise some very important ethical questions regarding the role of humanity in nature and his relations therefore with nature. Some of the ethical questions implied in *Silent Spring* are:

- Are the humans the only inherent valuable things in the known universe?
- Does the natural world - plants, animals, bioregions have - its own worth independent of the use to which it can be put by human beings?
- Do humans have moral obligations to nature and it's 'residents' and even the whole ecosystem?
- To what extent do ecological problems arise from anthropocentrism and from humanity-nature dualism?
- Do humans have any obligations to future generations?
- Is it morally wrong to exterminate a species of insects or plants, or even animals for that matter, in order for humans to continue to exist?
- Do chemicals that bio-accumulate, like DDT, generates social and ecological problems?
- Is human freedom compatible with the disappearance of everything wild and free in nature? And
- Is it morally right to allow poor people to die so as to preserve nature?

These questions will be answered in the following chapters as I try to find common ground between those who opposes the use of DDT, and those who support the use of these chemicals to control insect-borne illnesses particularly malaria.

During the Great Depression, World War II and the post-war industrial boom, a number of people called for the conservation of natural resources and to respect the land, but the calls did not have any effect with respect to a dramatic re-evaluation of accepted attitudes towards the nonhuman domain. Many people concede that *Silent Spring* was the catalyst for a heightened respect of nature and its inhabitants. Carson describes in her book the effects of pesticides on plants, animals, and humans. She describes that chemical treatment of soil led to the destruction of beneficial biological species, and that such destruction resulted in an imbalance in the ecosystem. Also, wildlife that ate chemically killed worms also dies. The widespread use of the

pesticides DDT had killed millions of songbirds by weakening their eggs (hence “*Silent Spring*”). So, Carson urged her fellow citizens to examine critically their attitudes towards living nature. I agree with her on this part; however she seems to be demoting human’s survival as not so important as against nature’s survival. Her book seems to be anti-human. Mostly her sentiments seem to be radical.

The alleged decline or disappearance of several species of birds, some symbolic, some common, and some rarely heard of, at least by their scientific names, has become another tool in the hands of environmentalists in their relentless attempts to ban DDT. It is impossible to prove the total absence of any chemical in any system, hence the charges that DDT could have caused, might have caused, possibly caused, or probably caused thin eggshells are impossible to prove or disprove (Beatty 1973: 69).

Numerous researchers have attempted to prove that DDT or one of its metabolites, particularly DDE, causes thin eggshells. The results of such an experiment are confusing to the layman and, in some instances, have also confused the researchers. Many factors are known to contribute to thin eggshells or to lack of hatchability. Diet, weather, noise, excitement, and a wide range of chemicals - including omnipresent PCBs, lead, mercury and dieldrin - are just a few of these factors (Beatty 1973: 70).

The anti-DDT activists insist that DDT and DDE cause thin eggshells and that their use has resulted in the decline of certain species of birds. So, rather than explore the unrealistic, inconclusive laboratory experiments, it is more germane to look instead at some of the birds alleged to be “endangered”. Whether DDT causes the mayhem as alleged by some environmentalists or not, will therefore be explored in the debate between those who are holding a position of human-centredness (anthropocentrism) or those who advocate for the intrinsic value of nature or the environment (ecocentrists). (See the relevant sections in chapter 2 and 3.)

However while the debate continues, many scientists continue to investigate DDT’s effects on the environment, and conservationists are also protesting against its prolonged use. Late in the 1960s the focus of the anti-DDT campaign shifted from public education to litigation, as new the group the Environmental Defence Fund (EDF), sought to bring scientific evidence to court, before an “impartial arbiter”,

avoiding what it saw as an unresponsive bureaucracy and lethargic public. The litigation, although extremely important, was also technical, and most citizens and the larger public were left as ignorant than they were before, since the talk was about “parts per million and billion” (Dunlap 1981: 3). There was further confusion stemming from possible confusion with DDT and PCBs (polychlorinated biphenyls), and the reproductive rates and migration counts of hawks they had scarcely heard of. If scientists had agreed, it would have made a choice easier, but there were imminent authorities on both sides (Dunlap 1981: 4).

Some doctors and medical scientists believed that DDT was a menace to human health, others said it was safe. Some entomologists, for instance came to the witness stand to say that DDT was vitally needed, while other entomologists appear to suggest that it was not needed at all. Similarly wildlife biologists claimed that DDT caused serious and possibly irreversible environmental damage, while witnesses for the DDT said that there were other explanations, and that, in some cases, scientists had exaggerated the problems (Dunlap 1981: 4). However the gist of the matter according to some scientists, particularly the anti-DDT lobby groups, appears to emphasise its unacceptable presence in the environment and danger to our health. They say it is a risk that we cannot afford to take. “DDT is so stable in the environment that it takes years for it to decompose after it is exposed to air and water. Ten years after DDT began to be used, studies found it in even the most remote areas of the world, places where it had never been applied. Wind and water transport DDT all over the globe” (WWF News Report March 2001).

And it then begins to show up in birds, fish, domestic animals, and humans. DDT accumulates in fatty tissues, and is passed from mother to their infants during breast-feeding (New York Times 2000: 12). This implies that nursing infants all over the world were ingesting DDT from their moment of birth.

The environmental movement, in part spurred by public fears about DDT and other pesticides, provided a complement to the laborious, formal courtroom hearings. In the late 1960s groups demonstrated against pollution and for a clean environment and clean energy. Congress passed a variety of laws, including the National Environmental Policy Act (NEPA), and President Nixon found it necessary to remove

his secretary of the Interior, who had become too much of an environmentalist for the administration. The federal government only wanted loyalists, who could push and protect government policies; somehow no dissenting voices were tolerated. Either you are for the government or you are against them. The poor Minister was removed from office for lobbying for the total ban of DDT (Dunlap 1981: 5).

In 1972, after a very long hearing, the Environmental Protection Agency (EPA) banned DDT and faced appeals from pesticides manufacturers, lumbermen, and interested citizens. Now 30 years down the line since it was banned, most people's memories about the controversy are very vague. Few remember the basis for the ban except to say it had something to do with cancer (BBC News 31-05 2002). And many people are still puzzled about the wisdom of the action.

What is the reality today? Malaria is a major cause of premature death in all countries with tropical regions. Malaria, for instance, was once a serious problem in the United States, but today it is practically non-existent, largely because of anti-mosquito campaigns soon after World War II. Affluent countries from the North are not affected by malaria having successfully rid itself of this deadly disease by using the tried and tested DDT, which they now vilify, calling it names such as "biocide". Seeing that other countries particularly poor countries are still being subjected to the deadly mosquitoes, the question arises why not spare them unnecessary deaths by not banning the DDT completely until a substitute chemical as potent as DDT, but environmentally less dangerous is discovered? Or is there an ulterior motive to control poor countries' population, as claimed by an entomologist that I interviewed at the Malaria Institute in Tzaneen (Limpopo Province). The fact of the matter is that the thought of mosquitoes causing death and disability seems not real to some enlightened populations. People commonly think of diseases as being caused by bacteria, which are a plant form of life, or viruses which seem to be little more than protein molecules. Malaria, however, is caused by a tiny protozoan parasite, an animal form of life. Rampant in human's blood stream, it causes successive attacks of chills and fever. It may kill a person or it may debilitate him so that he can devote only a fraction of his normal energy to his work. It can subside only to return months later, even though no new infection has occurred.

But what are the pro-DDT lobbyists saying against the proposed ban of malaria? Their expected response has been “show us the medical records among the billions of human beings that have died directly from the effects of DDT. Most medical scientists and entomologist and poor people in particular, who are directly affected by this scourge of epidemic believe that DDT has not been proven to be the direct cause of any human deaths” (Tsakane Furumele, an entomologist at the Tzaneen Malaria Institute). In South Africa when DDT was being used for a decade, there were less than 400 cases of malaria in all of South Africa, and in 1977 only a single case of malaria death occurred. Now, not only is the number of malaria cases increasing, but the rate of increase is also accelerating. Since South Africa capitulated to political and economic pressure from the developed nations, and stopped the use of DDT in 1995, its rate of malaria infections has quadrupled, and hundreds of additional deaths have occurred (National Department of Health). But since South Africa decided to rescind its decision to import banned DDT, it has angered Western ‘conservationists’, but malaria cases have now being brought under control. DDT is now used in combination with pyrethroids which are four times more expensive than DDT. It is used in combination with pyrethroids because a certain strain of anophelene, i.e. *funestus* has become resistant to DDT, but the *gambiae* is still susceptible to DDT.

“Banning DDT is eco-imperialism. It is the model of environmentalists putting the interests of the environment ahead of human lives. This is a classical case of being anti-anthropocentrism” says Dr Amir Attaran, Director of the Malaria Project, Washington DC. “But more troubling still”, says Attaran, “the international effort to ban DDT smacks of a rich country versus poor country fights” (Environmental News Network, November 1999). Although most developed nations banned DDT in the late 1960s, it was the world’s most powerful pesticides. It had proved its worth during World War II, killing malaria-bearing insects in the South Pacific. Most wartime pesticides at the time only killed one or two species of insects. DDT killed hundred of types of bugs at one time. Despite DDT being classified as a persistent organic pollutant, it is still widely used by an estimated 23 developing nations to fight malaria and its airborne carrier, the mosquito. According to Mr Abraham Gumede, the Kwa-Zulu-Natal health spokesperson, “Western nations are supremely ignorant of the fact that one in every 20 children in developing countries dies from malaria before their fifth birthday”. If you compared the years of life destroyed in Sub-Saharan Africa by

malaria alone, he says, “you’ll find that it was greater than all of the combined cancers in all of the developed countries put together”. In fact, 2.7 million people die from the parasitic disease annually. One-tenth of the world population is at risk because of it, and a staggering 500 million new cases appear in clinics around the globe each year - mostly in poor tropical regions (Dr Attaran). Any ban on DDT, says World Health Organisation, Director-General, Dr Gro Harlem Brundtland “would only deprive developing nations of an affordable and effective tool against the disease” (Environmental News Network, 1999).

Other health experts and environmentalists don’t see it that way “We’re frankly horrified by that argument” says Sharon Newsome, Director of the Environment and health Programme at Physician for Social Responsibility. “We know that DDT bio-accumulates, it persists in the environment, and it travels widely”, she says. “You may use it in Africa, but it ends up in many, other places” (Environmental News Network, 1999).

In fact, says Newsome, the highest concentrations of DDT found in the environment today are no longer found in the tropical zones: they are found at the poles. “DDT migrates to colder climates” (Sharon Newsome in Environmental News Network, 1999) Physicians for Social Responsibility and several other groups support a total ban on indoor and outdoor spraying of DDT. But, they also support a transition from DDT to less environmentally persistent pesticides like, pyrethroids - pesticides derived from chrysanthemums that has been used for centuries. Richard Liroff, director of World Wildlife Fund (WWF) also supports the transition to pyrethroids; he argues that “DDT is not the only affordable game in town” (Environmental News Network, 1999). He believes that DDT can cause cancer and human hormone disruption.

Others argued that Carson’s book was seen as scientifically worthless and as ideologically motivated as the germ warfare ‘science report’ (Jackson, 1998). According to some pro-DDT lobbyists Carson’s book falsely asserted that DDT was wiping out the planet’s animal life and poisoning human beings. They argue that these accusations were utterly baseless but were given credibility by its apparently ‘disinterested’ source, which was Carson herself. Her book triggered off an anti-DDT

campaign that bordered on the hysterical and whose resemblance to the Korean germ warfare campaign was uncanny (Gerard Jackson in *The New Australian* No 75, 4-10 May 1998). In fact, according to Jackson it made the organisers of the Korean propaganda campaign to look like rank novices. "That the only things that DDT ever poisoned and killed were fleas, mosquitoes, and other insects was completely ignored by an uncritical media and left-wing academics who saw it as a means to beat the anti-capitalist drum" (Gerard Jackson 1998).

Some critics argue that the most that could be said of Carson's book is that it pointed out that pesticides should be used with caution and that more is not necessarily better, as any scientist would confirm anyway. It is therefore clear that the real aim of the book was to inspire fear of pesticides, especially DDT. To stress her total hostility to DDT, and other pesticides she used the cheap literary trick of describing to readers a fictitious rural town completely wiped out by pesticides. She made it clear that that this grim tale would become a tragic reality unless a halt was called to the production of pesticides. Thus she dramatised fiction (Pojman 1994: : 356), transforming it into reality to deliberately demonise man made pesticides. This is another classical case where Carson demonstrates her anti-anthropocentrism. To her insecticides were the "elixirs of death" and DDT was the chief assassin (Pojman 1994: 355). By this means, she succeeded in making DDT seem like the Black Death. The truth, however, is very different. Her views on DDT were disgracefully misleading, consciously creating the impression that pesticides had no safe threshold. For instance, she claimed that DDT was cumulative, and yet it was well known at the time that a person's body, left to it, will rid itself of any amount of DDT it may have accumulated.

"DDT, undoubtedly the greatest life giving discovery of the century, is now a dirty word in exactly the same circles where the words CIA and Pentagon are dirty words. The same chorus tells us that we cannot or should not break the oil cartel, that we cannot build more nuclear plants because they are dangerous, that we cannot mine more coal because it ravages the earth, and lately, that we cannot drill for offshore oil because it devastates the tidelands" (Professor E.N Luttwak quoted in Gerard Jackson *The New Australian* No 75, 4-10 May 1998).

And it is the same chorus of environmentalists that refused to criticise communist tyranny. Greenpeace, for example, when asked by a journalist for its opinion on the Former Soviet Union invasion of Afghanistan, excused this brutal act of Soviet aggression by saying it was “understandable” (Gerard Jackson, 1998). It can indeed be argued that DDT is the greatest life giving discovery of the 20th century. When DDT made its debut in 1939 it was rightfully considered as a healthy substitute for existing pesticides which were highly toxic. It was during the war that DDT proved itself invaluable. It was discovered that DDT killed body lice without harming people. Its fantastic results in the Third World made it one of the great unsung achievements of the 20th century. In 1948, prior to the use of DDT, Ceylon (now Sri Lanka) recorded 2.8 million cases of malaria. By 1963 DDT had slashed the incidence to only 17 cases! When spraying ceased, the number of malaria cases on the island rose to over 3000 in 1967 and by 1968 this had surged to 1 million, leaping to 2.5 million in 1969. Out of sheer desperation the government immediately resumed spraying to the anger of the Western ‘conservationists’. Unlike the greens, the Sri Lankan government considered saving lives more important than catering to the ideology of the trendy Western ‘conservationists’. These people’s real attitude to the plight of Third World peasants was summed up by Professor Van den Bosch, of the University of California, who criticised others for being concerned for “all those little brown people in poor countries” (<http://www.sepp.org/NewSEPP/ECOTERRORISM.htm>) Tsakane Furumele, an entomologist at the Malaria Institute in Tzaneen, remarked that the ban of DDT “reminds her of Nazi Germany”, where people were left to die because of some kind of ideology. As we all know the rest is history.

In the early 50s population growth in the Third World jumped from the traditional one percent per annum to levels of 3-4 %. This was largely due to DDT slashing the death rate and also significantly reducing the parasitic and insect threats to the production and storage of food (Gerard Jackson 1998). It also allowed the cultivation of previously undeveloped areas where plant infestation had caused widespread malnutrition. (Greens believed it would have been better to have left those areas untouched and to have let the peasants die).

Dr Simmons in 1959 gave DDT a ringing endorsement when he stated that: “The total value of DDT to mankind is inestimable. Most of the peoples of the globe have

received benefit from it either directly by protection from infectious diseases and pestiferous insects or indirectly by better nutrition, cleaner food, and increased disease resistance. The discovery of DDT will always remain an historic event in the fields of public health and agriculture” (*The New Australian* No 75, 4-10 May 1998. Dr Samuel Simmons, is a head of the technology branch of the prestigious Communicable Disease Centre of the US Public Health Service).

Three years later, Dr Simmons’ honest and worthy appraisal of DDT was drowned out by green hysteria fuelled by Carson’s fantasy. If DDT had been a vaccine it would have been hailed as the wonder drug of the century. Instead, environmentalists attacked it with a vengeance. Why? The answer is as shocking as it is simple. It was attacked and banned for its astonishing success in saving the lives of millions of Third World peasants. These peasants, whom the Nazis called the ‘untermenschen’, were making the planet more crowded for the ‘Herrenvolk’ of the conservation movement (Dr Samuel Simmons in *New Australian* 1998).

Dr Charles Wurster, while chief scientist for the Environment Defence Fund, made this clear when in replying to a question about banning DDT, he smugly stated that there were too many people and “this is as good a way to get rid of them as any” (www.acsh.org/publications/reports/ddt2002.html). That his statement was directed at non-whites was made abundantly clear when he told a congressional committee: “it doesn’t really make a lot of difference because the organophosphate (pesticides) act locally and only kills farm workers, and most are Mexicans and Negroes” (www.acsh.org/publications/report/ddt2002.html). His appalling statement was met with mute silence from fellow ‘conservationists’ and the US government.

It has been estimated that during the 1930s about 5% of all deaths were caused by insect-borne infections. In the 1940s about 200 million people a year were struck by malaria, of which 2 million died. It was the world biggest killer disease and DDT beat it. In 1972 the ‘conservationists’ succeeded in having DDT banned in the US. Most of the world followed suit. The result has been human tragedy of massive proportions. Though their gruesome success against DDT can be measured in tombstones the actual misery they have caused, and are still causing, is beyond calculation. Because of this ban about 8 million people die each year from malaria.

And this is perhaps what the Greens and 'conservationist' like Charles Wurster want. People do not have the right to life, because they are poor, they are going to die anyway. In short what the Greens and their cohorts are saying is: nature first and poor people last. I would understand if the wish for the people to die was universalised, rather than be particularised. To Greens, people represent plague, there are just too many of them, or should I say: there are too many of the brown, black and some yellow sort?

What other conclusion can be drawn? The claims made against DDT by 'conservationists' have been proven to be either gross exaggerations or pure fiction. Moreover, when presented with the facts and the human consequences of the ban, the Greens still insist that the ban should remain in force.

Despite claims to the contrary, DDT was one of the least dangerous poisons available to the public. Not worse than the atomic bombs that the US and Britain, and the rest of the rich North possess. For about thirty years, hundreds of thousands of people had been employed in spraying with DDT, without any ill-effects, during which it saved millions of lives. In fact, DDT was no more poisonous to people than aspirin (Gerard Jackson 1998). This is not to suggest, according to Jackson, that DDT, along with other insecticides, should be thoughtlessly used, only that it be used intelligently.

'Conservationists' asserted that it was wiping out some species of birds. But this accusation was discredited by annual counts of bird populations conducted by the Audubon Society (New York Times, March 1997). These counts showed that many bird populations were rising during the heaviest period of DDT spraying. It should be noted that during this period the Robin became the most abundant bird in North America, even though 'conservationists' claimed DDT was rendering it extinct. Birds of prey were considered by many to be particularly at risk from spraying even though their numbers were also rising. For example, annual surveys of the Pennsylvanian Hawk Mountain Sanctuary revealed 191 Ospreys in 1946 but 600 in 1970 (Who is fooling who here? New York Times, 1997).

From the above it is evident that there is no conclusive evidence that DDT contributed to the decline of any species of bird as Carson claimed in her book. If DDT

accumulates in the food chain, then why is there no medical evidence to suggest or support her wild accusation of this 'killer' chemical? The whole thing seems to be not about DDT causing havoc to the ecosystem, rather a conspiracy to eliminate certain sort from the face of this earth. I hope I am wrong.

But let us assume that the presence of DDT in the environment is indeed wreaking havoc, the question that have to be answered is: what is more important: an ugly mosquito or bird, which is not sentient, or human life. What we know for sure is that banning or intended banning of DDT is killing millions of people.

The Greens seem to be on stronger grounds when they charged that DDT is causing untold misery to the bird population by causing the thinning of eggshells. Again, there is no scientific evidence to support these wild accusations. The truth of the matter is that the phenomenon of thin eggshells predates the existence of DDT. There is a wide range of causes, from defective diets to disease. Laboratory experiments in which various species of birds were fed phenomenal amounts of DDT failed to provide the evidence the 'conservationists' obviously craved for.

Dixy Lee Ray and Louis Guzzo charged that environmentalists like Carson and Paul Ehrlich are scare mongers, promoting lyrical hysteria, or should I say, the melodramatic assertion that DDT was reducing the world's oxygen supply by attacking oceanic plant life. Ehrlich's theory was thoroughly discredited in 1970 (Pojman 1994: 361). DDT was also accused of contaminating the food chain and of being a carcinogen. In September 1971, a special commission nominated by the US National Academy of Science to advise the EPA, concluded that "the toxicity studies on DDT have provided no indication that the insecticide is unsafe for humans when used in accordance with commonly recognised practice" (<http://www.newsaustralia.com.au/news4.html>)

Simply put the commission found no genuine cause for any anxiety regarding the use of DDT. Despite the commission's findings, American 'conservationists' still submitted a number of 'scientific' studies containing baseless allegations against DDT to the EPA. The rest is history. DDT was banned, and millions of people killed and are still being killed, as there are no alternative to the so called 'biocide'. The

conclusion seems to be inescapable, then, namely that the timing of the ban was calculated, callous and political, as victims of malaria were brown and black people.

1.2 Problem Statement

Although DDT has been banned in the United States and other European countries for over 30 years, it is still used extensively throughout the world, particularly in the Third World countries as a cheaper chemical to control the scourge of malaria. Today the DDT debate continues as modern environmental groups push toward a worldwide ban of all DDT and other POPs (persistent organic pollutants) by 2007. This has caused a heated ethical debate over the value of human life versus the health of the environment that could be compromised by the continual use of DDT. It is a question of whether to defend the environment as having an instrumental value or intrinsic value or humanity which is perceived as the author of environmental degradation. As this debate drags on as to whether or not to spray with DDT, the mortality and morbidity rate caused by infective anophelene mosquitoes, is not only increasing but accelerating at a frightening speed.

When DDT was first introduced in agricultural farming, scientists found no evidence that it would do us harm, so it was rushed onto markets and touted as the saviour for farmers. We now know the devastating and expensive environmental, and health effects it unleashed. Perhaps we could be more competitive now if we had exercised caution then, we may, at least, have saved ourselves the cleaning bill. DDT was used successfully to eliminate typhus and malaria in the US and other Western countries. Their decision to ban this chemical, however, is riddled with mysteries. It was effective and hailed as the 'wonder' chemical of the world, crowned, and glorified as the discovery of the 20th century. Those countries are now free from this terrible disease. Then why the rush to ban it elsewhere, where malaria is stills a problem? Why not give other countries that are under attack from this protozoan disease a chance to eliminate these infective mosquitoes carrying disease and then call for its banning, because it would have served its purpose? This bores the hallmark of selfishness, and total disregard for the life of Homo sapiens, particularly poor people of colour. Furthermore, chemical spraying is for all intents and purposes, according

to Western 'conservationists', stifling "progress" because lot of energies shall have to be channelled in fighting malaria without DDT and doing a lot of unnecessary research on new chemicals which will add another pollution load to the environment. Poor nations also seem to be a financial risk in that they are not in the position to purchase expensive drugs sold by the Western manufacturers. The West also does not seem to owe duty to poor nations, it appears to me, given their attitude regarding their hastily decision to ban this 'miracle' chemical. This seems to be the case, because the rich countries have not really bothered to spend millions in research looking for an alternative chemical that is as potent as DDT. Their concern it appears, is to see more technology being developed, to improve the potency of their weapons of "mass destruction" rather than be troubled by a mosquito which kills only the weak and the poor.

Carson was uncomfortable with DDT and other pesticides, because only one species, humanity was given moral consideration. She wanted moral consideration to be extended to nature. Somehow, DDT came about because of anthropocentric technology and altered planetary systems. "When the century began neither human numbers nor technology had the power to radically alter planetary systems. As the century closes, not only do vastly increased human numbers and their activities have that power, but major, unintended changes are occurring in the atmosphere, in soils, in water, among plants and animals, and in the relationships among all of these" (WCED 1987: 343).

Rachel Carson and her predecessors like Aldo Leopold feared the onslaught of technology which was seen as destructive progress to what is left of the natural ecosystem. They both feared this 'progress' on moral and practical grounds. Aldo Leopold valued nature in itself, and he understood that 'progress' was destroying the very land base it depended upon for survival in the long run (Leopold 1943). It was precisely for the same reason that Carson wrote *Silent Spring*, to expose detrimental effects of pesticides, used in agriculture; particularly DDT which she referred to as the "elixir of death". She wanted co-existence between humanity and nature.

Leopold and Carson are vindicated today, because hardly a day goes by, when we are not subjected to some environmental problem facing us today or in the near future.

We are surrounded by issues of global warming, species extinction, etc. What do these issues really tell us? In a time when extinction rates are greater than they have ever been in geologic history, it is alleged, we are faced with a call for action and compassion for the planet we live on. Humans are helped or hurt by the condition of their environment. Is it moral therefore to call for the total banning of DDT without providing an alternative? Is the ban going to jeopardise malaria control for millions of people, especially children?.

The 'deadly' chemical which has been blamed for the demise of essential species was protested and finally banned despite some of the positive contributions it made as the best available malaria-fighting tools. Concerned scientists and environmentalists argue that the key to preventing malaria's suffering and loss of life is the limited use of the pesticide DDT in people's homes to control the mosquitoes that carry the disease. As to how long this pesticide ought to be used many affected and interested groups believe it should be made available to those who need it, well into the future.

However the anti-DDT lobbyists think that it must be removed completely from the environment and that we should use biological control like beetles to control the infestation of mosquitoes. DDT has a long and a checkered history. Today it evokes particularly contentious argument. Though some environmentalists demand the total ban of this 'biocide', some tropical diseases specialists like entomologists laud DDT as a 'miracle' pesticide, an irreplaceable weapon in their fight against malaria. Which view prevail may be a life and death matter for nearly a half a billion people (<http://www.scincenews.org/20000701/bob2.asp>).

Spraying with 'discredited' DDT is seen by Western 'conservationists' as an anthropocentric action, in that it serves the human needs and interest, since, man is seen as supreme being, with exclusive value and importance. According to this anthropocentric view, the accidental death of some species like birds, fish, bees, etc., is not important, as long as man's well being is safeguarded. Anthropocentrists and entomologists who are lobbying for the continual usage of DDT into the future reject the insinuation by 'conservationists' that they do not care about nature. They retort that since man has an interest in nature, he is bound to safeguard and protect it.

Banning of this chemical is viewed as cruel to humanity. Nature's rights cannot override humanity's right.

In our culture anthropocentrism is virtually preconscious ... an unexamined presupposition of most popular reflections and utilisation policies regarding wild nature. Anthropocentrism in our human culture has both religious and secular roots. In some famous verses in Genesis, the Lord says "(Let man) have dominion ... over all the earth, and over every creeping thing that creep on earth". He enjoins man "to be fruitful and multiply and fill the earth and subdue it ..." (Genesis 1: 26-28). Many Western environmentalists have focussed on these verses as typifying the Western approach to man's place in nature (White 1967: 1203, 7). Nature is here created for human benefit, and the human role is to be master of nature. This means that man's quest to live and inhabit nature without fear, cannot be threatened by the blood-sucking, 'ugly' creature like the mosquito.

Though the secular rationale of anthropocentrism is somewhat different, it nevertheless leads to the same conclusions. Life has evolved to achieve self-conscious, rational, deliberative and personal capacities in the species *Homo sapiens*. While some species have sentient lives, most are neither sentient nor conscious. The fact that they are alive 'matters' not a bit, say to insects, trees, perhaps not even the hummingbird, that led to the writing of *Silent Spring*. Members of these species do not have the natural capacity to 'care', surely not; the mosquito does not care either for humanity. All they need, particularly female mosquitoes is to get human blood for reproduction purposes. In the interim they leave behind a deadly parasite in the human blood stream, plasmodium.

At the same time, some environmentalists will argue that mosquitoes, like any other species, have a 'right to life', they are a 'teleological centre-of-life', having a good or well-being of their own which can be enhanced or damaged. Accordingly, all individuals that are teleological centres of life have intrinsic value, equal to that of humans, which entitles them to moral respect (Taylor, 1996). This position of biocentric individualism, however, leaves us with little, if any scope to control malaria as a disease, and effectively reduces humans to the position of victims of

respect for insentient organisms. It not only creates the impression that insects are holier than humanity, but also that nature wins while humans loses out.

It seems evident that one needs to find ways outside of biocentric individualism and anthropocentrism as ways to valuing and defining our moral obligations to nature as a whole that makes up biotic communities, ecosystems and the biosphere. It seems as if both positions fail in their efforts to balance optimal human health and respect for nature; it seems as if both fail in their efforts to maximize good by saving lives and minimizing illness and unnecessary deaths. Above all, it seems as if we have to move beyond the fundamental assumptions of both biocentric individualism and anthropocentrism to overcome their respective outrageous practical implications.

Culturally humanity has been specified as the pinnacle of value and hence possesses moral considerability, and traditional morality has always specified a human agent, who is the actor in the moral play or the recipient of moral consideration. Individual humans were considered autonomous and rationally self determining. In this climate Immanuel Kant formulated his social contract theory whereby only rational human beings were capable of moral judgements, and so too they were the only individuals worthy of moral consideration (Kant in Pojman 1994: 28).

Kant described the social contract between such individuals based on 'imperatives' that served as rigid rules to guide human behaviour. Kant determined that rational, self-conscious beings were "ends-in-themselves" having intrinsic value. He considered it thus wrong to deny the people who are under attack from deadly mosquitoes to use DDT to protect themselves. In effect only human beings had the right to own himself or herself. Only rational, self conscious beings had the right, and all other beings including children, the mentally incompetent, animals and nature, wild or domestic, were only morally considerable indirectly (Kant in Pojman 1994: 28).

The killing of mosquitoes and birds for instance, is not bad at all according to Kantian ethics. Such species are not even sentient; therefore their destiny shall be determined by rational human beings who have ownership or use over them. If a man shoots his dog because the animal is no longer capable of service, he does not fail in his duty to the dog, for the dog cannot judge. But his act is inhumane and damages in himself that

humanity which is his duty to show towards mankind (Kant in Pojman 1994: 28). But can humans really show humanity to mosquitoes that relentlessly maim and injure them. In terms of a Kantian ethics, man has a right to defend himself, when under attack or when his existence is threatened.

According to Kant, classification as an end-in-oneself rests upon the ability to abstractly conceptualise one's ends, to 'self-value' (Callicott 1999: 252). Because Kant's social contract requires the participation of moral patients in a rational dialogue, it is easy to see why he excludes nonhuman nature. I do not think, however, that Kantian anthropocentrism, or 'ratiocentrism' as he calls it, can be fully supported, because it countenance painful medical experiments on pre-rational infants, hunting non-rational human imbeciles for sport, and making dog food out of post-rational elderly human-beings, among other wicked and depraved things (Callicott 1999: 252).

Anti-DDT lobbyists on the other hand appear to believe that a human centred valuing of the environment is the major ideological cause of the environmental crisis. The introduction of DDT is widely believed by ecocentrists to be behind the destabilising factor in the environment. Nature is said to be stable and habitable, and actions morally right if "it tends to preserve the integrity, stability and beauty of the biotic community and it is wrong if it tends otherwise" (Leopold 1949: 240).

Biocentrists attribute intrinsic value to nature, value which is not "dependent on its contributions to the value of another object" (Norton 1987: 151-2). This means that every living thing, including, insects, birds, frogs, deserve the ethical treatment generally reserved for humanity. The spraying with DDT and other pesticides is a further manifestation of selfishness and domination on the part of humans. The contribution of nature is not only limited to material contributions, but it extends to a large array of other less tangible benefits such as recreation or aesthetic enjoyment.

The argument of the biocentrists is that DDT has been proven to be lethal not only to mosquitoes and other insects, but it is also devastatingly dangerous to the health of the ecosystem in totality. Biocentrists, furthermore, liken their struggle against anthropocentrism to the struggle against racism – which is still defined in terms of the

protection of one group's interests and excluding other groups. Accordingly, biocentrists want human rights to be extended to women, nonwhites and other previously disadvantaged 'marginal' groups (Nash 1989; Karr 1990: 245). Biocentrism, however, is thought of by Western 'conservationists' in terms of Neo-Kantian terms as it places 'environmental objects beyond the reach of cost-benefit analysis'. Nature's dignity is beyond price and cannot be replaced by anything equivalent (Page 1992: 109).

Biocentrists also believe that the use of pesticides to control insects in agriculture and to kill mosquitoes carrying the parasite, anophelene, is an abuse of the land community, because we regard land or nature as a commodity belonging to us. "When we see land as a community to which we belong, we may begin to use it with love and respect ... that land is a community is the basic concept of ecology, but that land is to be loved and respected is an extension of ethics" (Leopold 1949: 8-9).

In terms of this perspective then, spraying with DDT is an anthropocentric action, which displays a callous disregard for nature and its species. However some medical ecologists go to the extreme end in their criticism of poor nations who want to continue with this 'biocide'. They perceive the millions of deaths happening as a result of malaria as bringing 'sanity to the world'. Those who use chemicals to spray are perceived as uncivilised, and irrational and deserving of death (New York Times 31 May 1987), as they too do not care about nonhuman beings.

Malaria is on the rise again, not only in poor nations, but rich countries as well, taking a life every thirty seconds of every minute of every day around the world (World Health Organisation, Director General, Dr Von Schrinding, 2000). Each year, more than one million people, mostly children in the developing nations, die of this dreaded disease. Millions more are sickened and debilitated at terrible human and development cost. But Charles Wurster, former chief Scientist for the Environmental Defence Fund (EDF), was once asked if he thought a ban on DDT might result in the use of more dangerous chemicals and more malaria cases in Sri Lanka. His reply was diabolical, "Possibly ... so what? People are the cause of all the problems. We have too many of them. We need to get rid of some of them, and this is as good a way as any".

His views are hardly atypical. According to *Earthbound* (1996), which is a collection of essays on so called environmental ethics, one of their spokespersons, Charles Wurster responded this way after it was pointed to him that malaria was causing havoc. He replied, “massive human diebacks would be good. It is our duty to cause them. It is our species duty relative to the whole, to eliminate 90% of our numbers”.

Another research biologist, who espouses almost similar anti-anthropocentrism view, is former National Park Service biologist in the US, David Graber, who famously remarked, “We have become a plague upon ourselves and upon the earth. Until such time as Homo-sapiens should decide to rejoin nature, some of us can only hope for the right virus to come along” (<http://www.nationalcenter.org/tp2.html>).

If radical environmentalists were to invent a disease, to bring human population back to sanity, it would probably be something like HIV-Aids (*Earth First! Newsletter* 1989). It has the potential to end industrialism, which is often regarded as the main force behind the environmental crisis (*Earth First! Newsletter* 1989).

Lung disease affect some 30 million people in developing nations every year according to WHO, waterborne diseases like dysentery, kill 10 million annually, half of them infants and children. These diseases are readily preventable, and unheard of in the affluent North. They are due to the virtual absence of electricity and clean water - problems readily addressed by the construction of hydroelectric dams.

But radical environmentalist Lisa Jordan, Director of London's Bank Information Centre, says “dams damage the path of rivers and kill little creatures along their banks”. Brent Blackwelder, President of Friends of the Earth, on being interviewed on SABC-Africa Channel, dismisses concerns about human death saying “dams serve only greed, and people in developing countries, simply these people cannot expect to have the material lifestyle of the average American”.

No human action is right in the eyes of ‘conservationists’ of this persuasion. According, to them we may not according to them to use chlorine anymore in future to purify the water, even fly the plane to go to another destination, or worst still, not

bury dead people anymore or engage in agricultural activities, because we will be impacting negatively on the topography of the land. These very 'conservationists' are always complaining about how global warming will cause an increase in malaria incidences ... itself a specious argument. Why fear the onslaught of malaria if the only chemical capable of stopping these pests is regarded as a 'biocide'? Their resolve (conservationists) to have DDT banned is simply disingenuous and hypocritical", entomologist spokesperson in Tzaneen Malaria Institute asserts.

Earth First! Founder David Foreman, once offered this suggestion for dealing with famines in Ethiopia: "The worst thing we could do is to give aid ... and the best thing would be to just let nature seek its own balance, to let the people there to just starve" (New York Times, March 1983). It is interesting to note that Foreman wants nature to seek its own balance in poor countries, and not in the rich countries. This is typical Western 'conservationists' eco-imperialism, and is tantamount to genocide, far worse than the Jewish killings by the Fuehrer. This indeed is a modern version of managing a population 'implosion'. The time has come for these environmental interest groups to be subjected to the same public scrutiny and accountability they demand from industry and private citizens.

Why has the debate to spray or not to spray with DDT continued for so long without an amicable solution? Why are the pro-DDT and the anti-DDT not sitting down around the table to look for common grounds? Is there an official policy to reduce the world population by the affluent North? Or is it the rich versus the poor in the struggle for survival?

The two sides at the end shall have to realise that their animosity and indifference shall only account for more body counts. Are we lacking moral ground to inform our behaviour? Our conception of morality is often affected and influenced by our upbringing (Causey 1989: 333-334). The dying birds or fishes may not have a bearing on a child coming from poor rural settings. His/her only concern is that of survival, and that of his own species. Yes, each group in the debate has different value system which they base on various concepts, usually according to the necessity of their daily living. Human health is important as much as the health of the ecosystem.

Leopold (1966: 227) argues that man has become super civilised when he fails to be moved by the intention of nature. Man is deeply associated with nature and experiences value in relationships which remind him of his dependency on the soil-plant-animal-man food chain, his origin and evolution, the fundamental organisation of the biota and those ethical restraints, like killing other species like birds, insects, etc. The fact of the matter in the final analysis, however, is to search for ways which will satisfy both parties embroiled in this dispute; we cannot afford to lose more lives. One life lost is one life too many.

1.3 Methodology

Given this controversial ethical debate on whether to spray or not to spray with DDT, this assignment will try and find commonality between the warring factions that is the anti-DDT lobbyists and the pro-DDT proponents so as to try to resolve this problem which has been raging on for up to thirty years. This assignment will try and see if the two opposing factions' decision to either support DDT or call for its banning, is motivated by environmental concerns or by some ulterior motives, and whether those who are calling for the continued use of the chemical are really driven by the desire to stop the killings by the deadly mosquitoes or not. Are the decisions of the two groups ethically informed? Who are important, humanity or birds, mosquitoes or both, and who has intrinsic value or instrumental value? Can we sacrifice human lives for the sake of the integrity of the biotic system?

These questions can be answered once the misunderstanding between parties have been identified and clarified. The misunderstanding between the parties, i.e. the pro-DDT and the anti-DDT will be based on why the pro-DDT wants the chemical to be continued to be used into the future, why do they insist so much on it? Are the alternative methods that could be explored? And on the other hand the anti-DDT proponents should be able to explain why they demand the blanket ban of DDT, whilst there is no alternative pesticide as potent as DDT? Why do they not care about deaths happening in poor countries? Can man kill in self defence? Here I will explore Taylor's principles of self defence to see if there could be any justification for such defence.

The attitude of the warring factions and their different personalities will also be visited, such as why nature ought to be protected at the peril of humanity, and why deaths happening in poor countries are not really so topical? In short why is nature favoured so much in the North, more so than poor people? Or should we forsake compassion for humans to preserve the environment? Should we forsake the rights of individuals for the benefit of the whole?

The reader of this assignment will be assisted by the points discussed to arrive at an informed decision, as to whether to support the spraying or not with DDT to control malaria. It is obvious given the length of this debate, for the last thirty years or so that there is no party which wants to give in to the demand of the other party. This assignment will hopefully try and narrow the gap that is presently widening, and reinforce areas of commonality, and show by argument where the scale tips. Even if one group is proved correct and the other wrong, affected persons will nevertheless continue to spray or reject DDT as a chemical of choice. It is human nature. However this assignment strives to make a difference in attitude, and perception of these two mistrusting groups. Hopefully the reader will be assisted in this regard to make a conscious, ethical choice to decide on their course of action, based on the results of the arguments debated.

The different group's position and arguments will be discussed in detail in Chapter 2 and 3. Main points of disagreement will be indicated, and the methods of resolving such disagreements or weaknesses will be identified on both sides, and will be resolved by dialogue between affected and interested parties. Banning DDT itself is not a solution; I must hasten to say, prior to finding an alternative chemical. The banning will without doubt, exacerbate the killing fields currently existing in the poor countries, particularly Africa. Similarly not to ban DDT is also atrocious given the level of destruction, and mayhem it allegedly causes in the environment, given the number of birds which are dying, and the possibility of humans finally paying the price in terms of body count.

Chapter 4 will look at solutions based on the arguments of both pro-DDT and anti-DDT proponents. The idea will of course be to look at finding common grounds to

resolve this impasse. The question of prolonging the DDT debate, whilst millions of people die, and certain birds species becoming extinct will be addressed. Whether agreement between the warring factions is achievable or not will also be discussed, though not in details.

There is no doubt, that the factions involved in the debate are belonging to two extremes, namely extreme anthropocentrism and radical ecology. I will argue that the land ethic will form part of the solution, and the opposing ethical views will be combined to find a product or solution which will be acceptable to both parties. Racism which seems to appear in certain circumstances will also be briefly discussed. Lastly, there is no much literature available on this contentious issue of Malaria and DDT. Some of the authors from different schools of ethics will be quoted to help resolve some of the problems. Most information on malaria and DDT are coming from Newsletters, and magazines. The general approach of most of these letters is not ethical approaches, though, but scientific information.

Finally my assignment is not prescriptive, as to what people ought to do or not to do, but I hope it will elicit more research and debate on this moral dilemma.

Chapter 2

Basic Arguments Against the Use of DDT

In this chapter seven main arguments against the use of DDT will be discussed. The detrimental effects of DDT on wildlife and human health respectively constitute the first two arguments; that the use of DDT cannot be reconciled with the ideals of sustainable development makes up the third argument; the autonomy of nature will be presented as the fourth argument wherein grounds for respecting nature are argued; the anti-anthropocentric argument that human needs are incomplete source of valuing non-human being is the fifth; the ecological considerations that human action should make sense in ecological contexts and timeframes forms the case of the sixth argument; and the use of DDT clashes with an ethics of reverence for being constitutes the seventh argument. However, before they are analysed, it is expedient to first of all revisit Rachel Carson's *Silent Spring* that, to a large extent, has set parameters within which all seven of these arguments should be interpreted.

2.1 *Silent Spring* revisited

Many people agree that Rachel Carson's book, *Silent Spring* (1962), was the catalyst for the environmental movement. Carson describes the effects of pesticides on plants, animals, and humans. She stated that the chemical treatment of soils led to the destruction of beneficial species, and that such destruction resulted in imbalance to the ecosystem. Also, wildlife that ate chemically killed worms also dies. The widespread use of the pesticide DDT had killed millions of songbirds by weakening their eggs (hence "*Silent Spring*"). So, Carson urged fellow citizens to examine critically their attitudes towards living nature. Her book had far reaching implications in her effort to urge fellow citizens to examine critically the notion that nature has inherent worth and to inquire into the possibility that humans have moral duties to animals, plants, and ecosystem.

She was interested in developing a moral philosophy that restricts ethical theories, which in turn imply practical rules of behaviour. She believed in the power of reason to persuade and to obtain consensus, to direct individual's action, to change social values, and to forge new cultural ideas. Carson's intention was not to campaign for the banning of DDT and other pesticides, she merely questioned the morality of spraying, which inadvertently killed non-targeted species.

Carson writes in her book: "The history of life on earth has been a history of interaction between living things and their surroundings. To a large extent, the physical form and the habits of the earth's vegetation and its animal life have been moulded by the environment. Considering the whole span of earthly time, the opposite effect, in which life actually modifies its surrounding, has been relatively slight. Only within the moment of time represented by the present century has one species – man – acquired significant power to alter the nature of his world ... 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" (Carson, 1962). Her book brought the insight that the growing ability to dominate and control nature could prove counter productive and that humans need humbleness and an ethic that stressed "sharing our earth with other creatures" (Carson, 1962).

Edwin Way Teale also warned: "A spray as indiscriminate as DDT can upset the economy of nature as much as a revolution upsets social economy. Ninety percent of all insects are good, and if they are killed, things go out of kilter right away" (<http://www.worldwildlife.org/toxics/progareas/pop/ddt.htm>).

Silent Spring meticulously described how DDT entered the food chain and accumulated in the fatty tissues of animals, including human beings, and caused cancer and genetic damage. A single application on crop, she alleged, killed useful insects for weeks and months, and not only the targeted insects but countless more, and remained toxic in the environment even after it was diluted by rainwater. Carson concluded that DDT and other pesticides had irrevocably harmed bird and animals and had contaminated the world's entire food supply. The book's most haunting and famous chapter, "A fable for tomorrow" depicted a nameless American town where

all life - from fish to birds to apple blossoms to human children - had been 'silenced' by the insidious effects of DDT (<http://www.nrdc.org/health/pesticide/hearson.asp>).

Michael. B. Smith writes: “ “The control of nature” is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists for the convenience of man. The concepts and practices of applied entomology for the most part date from that Stone Age of Science. It is alarming misfortune that so primitive a science has armed itself with the most modern and terrible weapons, and that in turning them against the insects have turned them against earth” (<http://www.nrdc.org/health/pesticide/hearson.asp>). What the author had in mind was to awaken humanity out of ethical and moral somnolence, and challenging the dominant scientific paradigm. Despite being largely a synthesis of studies showing the ecological toll pesticides, and other agrochemical were exacting, *Silent Spring* and its conclusions came as a shocking revelation to most Americans, and later the whole world.

Following on the heels of the thalidomide and recent publicity about the danger of nuclear fallout, *Silent Spring* reached an audience already anxious about the brave new world of chemicals and atomic energy. Carson thus invokes Albert Schweitzer's epitaph to humanity in the introduction to her book ... “Man has lost the capacity to foresee and to forestall. He will end up destroying the earth” (Ralph 1985: 211-225). According to WWF (News Report March, 2001) we seem to have not learned the moral of Rachel Carson's “A fable for Tomorrow”, her story about a world with no bird songs, no edible fish, and poisoned people. The alternative science, with its view toward maintaining a balanced relationship between humanity and nature, that she and a minority of others have advocated, languishes on the fringe of the scientific and cultural discourse. Without discarding science's benefits to humanity, Carson shook her fingers at the careless, regressive path science had taken with regard to pesticides. With its call to action, *Silent Spring* was a political statement and its very publication expressed the sentiment that science is a social process.

Environmental groups like the Friends of the Earth, and Physicians for Social Responsibility, Greenpeace, and other environmentalists believe that humankind's rigid, impatient attempt to order the natural world constituted an abrogation of moral

responsibility to both humans and the rest of the natural world. The debate about DDT lies with morality: in questions about how to define moral considerability, i.e., moral science versus immoral science. "Through all these new, imaginative, and creative approaches to the problem of sharing our earth with other creatures, there runs a constant theme" (Carson 1962: 261), Carson wrote in *Silent Spring*: "and only when we revere all life, develop a science that embraces accommodation rather than conquest, will we evolve beyond that 'Neanderthal age of biology', and its attendant equivocating morality". To call Carson "The Ruthless Beauty who helped Provoke the Violence" is therefore seen as being hypocritical and venomous by the Western 'conservationists' (Smith, 2001).

While banned decades ago in industrialised countries, thousands of tons of the deadly pesticides DDT are still produced each year, particularly by India and China, causing health and environmental hazards globally because of its long life and ability to travel great distances (WWF 08/20/2002).

DDT's only official use, as specified by World Health Organisation (WHO), is for the control of disease vectors in indoor house spraying - although other (illegal) uses are suspected. Because of the availability of safer and effective alternatives for fighting malaria, WWF is calling for a global phase-out and eventual ban on DDT production and use (WWF/01/1999: WWF efforts to phase out DDT).

Because DDT can travel long distances and accumulate in the body, millions of humans and animals worldwide have build - ups of the chemical in their tissue, even though it may have been used on another continent. It is mostly transported by winds to far away places, particularly the poles. WWF supported research; for example has found that black-footed albatrosses on Midway Island are contaminated with DDT, as well as PCBs and dioxins. There are no known uses of these chemicals on Midway Island, which are located 3,100 miles from Los Angeles and 2,400 miles from Tokyo (WWF/08/20/2002).

Further studies have linked DDT to feminization and altered sex ratios of gulls and eggshell thinning in birds of prey (Dunlap 1981: 18). DDT has also been shown to

have effects in animals or humans such as reduced lactation and reproductive problems (Dunlap 1981: 81).

2.2 Wildlife and DDT

Earlier tests with DDT had been done in forests - to assess the usefulness of the new insecticide against the gypsy moth and the spruce budworm - and wildlife biologists had been called to study the effects of the sprays. Their role, though, was largely limited to assessing the immediate mortality on susceptible organisms, setting down rules to minimise the toll of birds and fish. By the time DDT was available for general civilian use, there was a large body of knowledge to aid entomologists in planning safe campaigns. Studies conducted in US and Canada showed the dangers of DDT and the ways in which to minimise damage to the environment. Heavy or carelessly applied sprays, they warned, caused extensive mortality among fish and birds. For example, two investigators had found that a single application of DDT to a Pennsylvania forest at the rate of five pounds per acre “resulted in the death of birds and a conspicuous reduction in the breeding population” (Dunlap 1981: 77).

In small doses, DDT residues affected hormonal balances, this effect, expressed in the reproductive failure of several species of birds of prey, was a key element in the environmental case against DDT in the late 1960s. In large doses, though, DDT was a central nervous system poison, and this was the most obvious effect. Until scientists found evidence of reproductive failure connected with the residues, they assumed that poisoning would be a major problem.

The high toll of non-target organisms and environmental damage stirred public interest in, and scientific investigation of, DDT far more effectively than any scientific warnings. People could see dead robins on their lawns, count the cost of the local program, and attempt to weigh inexpensive protection for their trees against the morning chorus of song. “It was this program that gave Carson the image of the silent town in *Silent Spring* (Dunlap 1981: 79).

In South Africa according to scientific research, there has been no deaths reported of wildlife from DDT. Most deaths, it is alleged, occurred in America, and elsewhere but

Africa. When DDT was used extensively as a spray, fifteen of twenty six birds tested in Cleveland, Ohio, had DDT in their tissues, including ten immature specimens that could only have accumulated the residues there. A population survey was even more disturbing, nestling survival was only about 44 percent in the sprayed area, compared with 71 percent in an adjoining unsprayed tract. Not only birds became casualties, but earthworms too were rapidly disappearing (Dunlap 1981: 81). Birds were found tremoring, and finally frogs and fishes gradually disappeared from nearby streams, and the salamanders in the woods became scarce, and then disappeared. By 1957, George Wallace, an ornithology professor at Michigan State University realised that the culprit was DDT spray, and he discovered that it was decimating the songbird population on campus. He found that as birds arrived from the south, the population rose to a maximum of eighteen pairs on a hundred-acre campus in Mid-April, and then declined rapidly. Only three pairs were left at the end of May (Dunlap 1981: 84-84). There were also severe declines in resident bird population, particularly insectivorous and ground-feeding species. There was a huge outcry when ninety four birds were discovered dead, and chemical analysis of the dead birds showed that at least thirty four of them had a massive accumulation of DDT in their tissues. There was a high correlation between high DDT levels and death. Dead and dying birds generally had lethal amounts of DDT in their brain, and there was contamination of the eggs in deserted nests, embryos and nestling. Bird collected outside the area, on the other hand, had lower levels of DDT or none at all. The breeding population was disrupted. All the dead birds, fishes, frogs, earthworms, etc., bore the hallmark of the deadly DDT chemical. Snakes, lizards, game-bird and fish were also rapidly declining as a result of the failure of their reproduction (WWF 08/20/2002).

Not until 1962, when the publication of Rachel Carson's *Silent Spring*, did the situation change, and then it changed both drastically and permanently. *Silent Spring* marked a watershed revolution, as the private, and scientific debate became a public, political issue.

2.3 Human Health and DDT

Environmental scientists believe that the controversial pesticide, DDT, is responsible for premature puberty in girls in developing countries. Researchers in Belgium, who

carried out the study, found that children who had emigrated from countries such as India and Colombia were 80 times more likely to start puberty unusually young. Three-quarters of these immigrant children with “precocious” puberty had high levels of a chemical derivative of DDT in their blood (BBC News, Wednesday, 16 May 2001, 18: 05 GMT).

This chemical, DDE, mimics the effects of the oestrogen hormone, which plays an important role in controlling sexual development. The girls in the Belgian study began developing breast before the age of eight, and started their periods before they were ten. The team, led by Jean-Pierre Bourguignon from the University of Liege, discovered that children immigrating to other European countries also had an increased tendency to begin puberty early. They did not believe that this could be entirely attributed to a better diet. The team tested the children for a range of pesticides and found that 21 out of 26 immigrant children with “precocious” puberty had high levels of DDE in their blood. The chemical was detected in only two out of 15 native-born Belgian children (<http://news.bbc.co.uk/1/hi/health/1333875.stm>). Their findings however may not be entirely conclusive because they did not test immigrant children who had not started puberty early for pesticides. Also the fact that native Belgian children also had levels of DDE in their blood despite them not having been exposed to DDT directly.

In addition, David Buffin from the Pesticide Action Network said: “We have known for a while the chronic problems associated with DDT. And we have been concerned about its chronic effects in terms of cancer and its effect on reproduction. It is a known carcinogen and is suspected to disrupt the endocrine system” (<http://news.bbc.co.uk/1/hi/health/1333875.stm>).

Friends of the Earth (FoE) is equally worried that DDT used in foreign countries is entering the food chain closer to home with the increase in imported food. FoE’s food campaigner Sandra Bell said: “This certainly seems to add to the weight of growing evidence that hormone disrupting pesticides could be having a very serious long term effect on our health and add to our demand that we should be banning all hormone

disrupting pesticides which are turning up in our food” (<http://news.bbc.co.uk/hi/health/1333875.stm>).

DDT is listed in the National Toxicology Program’s Fifth Annual Report on Carcinogens as a “substance which may be anticipated as a carcinogen”. The EPA categorises DDT, DDE (dichloro-2, 2bis (p-chlorophenyl) ethylene), DDD (1, 1-dichloro2, 2-bis (p-chlorophenyl) ethane). Individuals involved in the formulation of DDT have contracted rashes or irritation of the eyes, nose, and throat. Acute exposure at high doses primarily affects the nervous system. Longer term exposure to DDT may also affect the liver. In low doses, DDT may increase the ability of the liver to metabolise some compounds, while at higher doses, it may cause unusual growth or tumours or death of whole group of cells (necrosis). Children who are breast-fed are at risk of exposure to DDT, because the chemical is ubiquitous and is found in human milk in higher concentrations than those in cow’s milk or other food. People more susceptible to the toxic effects of DDT are individuals with disease of the nervous system, liver, or blood (<http://www.nsc.org/library/chemical/ddt.htm>).

In South Africa, where DDT is still used in tropical areas, particularly for agriculture and indoor spraying of mosquitoes, breast-fed children were found to be receiving fives to 18 times as much DDT from milk as the WHO recommends as an acceptable daily intake. Some studies show that DDT shortens the time of lactation (Chem Eng News, 9/20/99).

It is therefore quite evident that DDT and its metabolites cause an immune destabilisation in the ecosystem and the human body. It therefore seems justified in calling for its banning, but the question whether the environmental damage to birds, fish, frogs etc. outweighs the loss of millions of people dying of mosquito-borne malaria each year?

In the sections that follows, further aspects of the ethical debate will be considered as to why DDT ought to be banned to help preserve the integrity and stability of the ecosystem and why some environmentalists feel that the environment has inherent value and not instrumental value.

2.4 Sustainable Development Argument

Sustainable development as defined by the WCED Report (1987: 43), is “development that meets the needs of the present without compromising the ability of the future generations to meet their own needs”. This short definition encompasses the idea of basic human “rights” to food, water, and so on, as well as the idea of intergenerational equity. It also implicitly rejects the idea of sustainable growth beyond the limits of supporting ecosystems.

Hampicke (1994: 219-231) reminds us that the concept of intergenerational justice demand our outmost efforts to minimise human impact on the environment. Future generations have a right to the same opportunities for benefiting from nature that we do today. Loss of biodiversity reduces the number of species that future generations can choose to use. We are therefore morally obliged to live sustainably.

John Rawls’ theory of justice explains more clearly the fairness of providing equal environmental freedom for every human being. Rawls envisions a thought-experiment in which every person is behind a “veil of ignorance”. This veil hides each person’s material and social standing without knowing what kind of position he or she has in society, each individual must determine the best distribution of wealth. Rawls maintains that from behind the “veil of ignorance”, every person will choose a distribution that maximises the situation of the most disadvantaged person (Hampicke 1994: 221). If Rawls’ theory is applied to environmental freedom, the “veil of ignorance” would dictate stringent world-wide conservation efforts because “harm done to nature is, among other things, harm done to human beings, if they need or appreciate or love nature” (Hampicke 1994: 221).

So far, we have understood that Rawls provides us with theories of justice which can be applied in conservation. This theory addresses the rights of people living today. It is morally correct, however, to assume that future generations have equivalent rights whenever we make any decisions that will affect them (Hampicke 1994: 221). This concept of intergenerational justice reinforces our moral obligation to conserve nature, we must take on the responsibility for preserving environmental freedom for generations to come.

Thus every human being has a moral obligation to act in a responsible way towards the environment. Although this may impose certain restrictions on personal freedom, it is just as much of a civil obligation as refraining from wanton killing, stealing or mugging. It is in humanity's long-term interest to avoid environmentally destructive behaviour as is the case with DDT spraying.

From this perspective, it is evident that humanity is exploiting nature recklessly, without attention to the minimum health of ecosystems. What is clear: humanity has no ethics for the environment and its nonhuman beings. Individual organisms are unique in their life-world and the interrelatedness of species in communities. Humanity furthermore needs healthy ecosystems and environments for their sustenance. From the above, it follows that DDT is one of the destabilising factors in the environment. According to Carson et al., this 'biocide' is causing mayhem of unprecedented magnitude, and impacting negatively on the health of the environment. Humans and nature are like Siamese twins, tenaciously attached to each other, so much that the death of one spells the end for the other. Human's quest to dominate and control nature can therefore be translated as the end of civilisation, the end of life. Civilisation calls for humans to act with constraint, diligence and passion to other nonhuman beings, who otherwise cannot use democratic channels, like protest to register their anger and frustration against anthropocentric impacts on their habitat. Every organism is a teleological-centre-of-life. Compassion in this ecological sense means affording other creatures "a better life for all", as the ANC (African National Congress) slogan reads.

Whether DDT has spelled the end of the songbird and the beginning of a doomsday book of atrocities is a mute point. Human activities are callous and are indeed responsible for probably 400 species a year that are driven to a premature extinction, and 100,000 species are threatened every year (Myers 1984: 52). Twelve million hectares of forest are cleared annually and 10 million hectares are degraded. Marsh lands are filled in, coral reefs are mined, and grassland is paved over. The human impact on the environment is not negligible. Over 450 millions humans are chronically malnourished and 40 million die annually from hunger-related disease (Myers et al., 1984: 55). Yet people are ignorant of these facts and detached from the

consequences of their personal action. Most humans' attitude towards nature are anthropocentric and negative (either the affection for or avoidance of individual animals, whether large or small), and moralistic and utilitarian (concern for the treatment and use-value of these animals). However nature-orientated and ecological views are less prevalent.

Most people know that a lion, elephant, leopard, and any other animal for that matter, can inflict injury and death in most cases. Yet most people don't know the extent of damage pesticides do to the fragile ecosystems, particularly endangered species were least known. Most people that were interviewed in Tzaneen during my study have never heard about the DDT controversy, and its impact on the health of birds, fish and humans. All they know about is the deadly mosquito which is ravaging their communities.

We are distanced from what we cannot see, and from what we cannot understand. So much is outside our experience. Whether harm befalls us from using this 'biocide' pesticide and our immediate environment does not outweigh the importance of killing deadly mosquitoes. We are incapable of responsibility. Helpless, afraid of death, we become detached. We cannot express what is wrong. Where Wordsworth saw consolation, joy and wisdom in nature, Tennyson saw nature "red in tooth and claw". The process of nature is inhumane, according to Earth First! defenders. Death brought about by infective mosquitoes, is justifiable because nature rules, and man must subordinate himself to the dictates of nature (New York Times: 31 May 1987). We have ceased to be members of the greater community. We have become unconscious to the ethics of care. Our consciousness is marred by its faulty ecology and its unwillingness to accept death as the way of the ecosystem (Shepard 1978: 205).

What sustainable development implies is that when we look at nature and its nonhuman beings, to inculcate responsibility, we need to consider them as communities, not some kind of ugly animal or insect. Colinvaux states that species result from the process of avoiding struggles for existence. Yet they are still related. The notion of human separateness may be an illusion of imperfect sense or an undeveloped brain (Colinvaux 1978: 87). Speciation is a great invention of nature.

Although individual species, and certainly individual animals, may not be necessary to its functioning, the richness of nature depends on complexity.

DDT spraying is threatening bird's survival, as they had to relocate in the face of this chemical onslaught. Once birds sense that their territory is under threat, they migrate (Dunlap 1981: 105). But the problem is that birds are territorial, highly social, with a very narrow range of habitat. Colonies of birds are so territorial that after relocation, nest abandonment occurs in less than one percent of observed cases. Unfortunately their habitat in many cases is also coveted by humans, who are forever expanding. Many bird species, therefore, cannot behave normally unless their habitat is saved from human intrusion (Rodman 1977: 63).

Every species is 'useful' in nature as expressions of variety, niche makers, and feeling beings. By killing off select species, like mosquitoes, humans are changing the character of the ecosystems possibly reducing its stability and integrity and diversity. Fox (1980) states: "No species is more ... or less ... important than another, even if the ecosystem were to remain relatively unchanged in the absence of one species ..."

Cooperation between humans and nature is an effective strategy as is competition, and is necessary. Survival of the fitter is correct only up to a point, beyond that it is survival of the more cooperative. Neil Evernden (1981) notes that organisms, unlike the standard Darwinian description of them, go to absurd lengths to avoid direct competition. What are recognised as species are a rainbow of attempts to avoid competition, to share the life-base. Diversity enhances the potential for survival. DDT and other pesticides threaten the potential for the enhancement of diversity. Arne Naess (1972) believes that "live and let live" is a more powerful principle than either/or. In the final analysis, cooperation is a natural rule. It creates communities, living entities in ecological balance. There is wisdom of life, a "biosophy" in Stephen Lackner's (1984) words. Humanity's endeavour should be that of creating peaceful habitats. The richness of the world and the freshness of response are matters of novelty. DDT spraying takes away that richness, fullness and replaces the diversity with degradation.

“The obligation to respect every species independently of its worth to people may conflict with human interest, if a species endangers human health or survival. Many people feel that it is morally justified to eradicate human pathogens that is not present in any other host and is responsible for considerable loss of human lives, poor health and disability. Such species include the human immunodeficiency viruses (Hiv-1, Hiv-11), the smallpox virus, the poliomyelitis virus, plasmodium falciparum (the cause of malignant malaria), and guinea-worm” (IUCN 1991: 15).

This means that there is nothing immoral and unethical if one responds in the same breath if attacked by harmful species. Humans have the right to defend themselves, and if possible eliminate the threat completely from the system to ensure his/her survival and that of his/her own (IUCN 1991: 15).

But humans’ response should be appropriate. It should not be callous and result in extinction. However some of these attacks unleashed by mosquitoes are as a result of the shrinking environment of the nonhuman beings. If somebody were to attempt to uproot you from your house, for instance, one will surely resist. Mosquitoes are unfortunately responding to that threat. They have the same right and interest of their own like human beings (IUCN 1991: 15). Humans’ demands on the natural environment are growing, and the niche of other species is fast being eroded and shrinking. Environmentalists, however, are asking whether it is justifiable for an intruder to launch a relentless attack on these poor creatures, are they not having the right to defend themselves too?

“The obligation to protect all creatures from cruelty, avoidable suffering and unnecessary killing can also conflict with the requirements that no people should be deprived of its means of subsistence” (IUCN 1991: 15). Humans are essential assets in the ecosystem, and equally deserve to share the resources in the environment with other species, so long as the attitude is not that of being driven by thoughts of conquest and domination. So, careless usage of chemicals predisposes non-targeted species to unnecessary cruelty, and possibly extinction, as has been explained, and will result in undermining the stability, beauty and integrity of the ecosystem, which will result in intergenerational injustice.

Therefore, DDT spraying has been identified as one cruel way that has accelerated an imbalance in the ecosystem and raped the ecosystem of its integrity. Whether one species or more is completely eliminated during the DDT spraying or not will inevitably result in colossal destabilisation of the ecosystem with no thought for the next generation. Therefore, it seems that until humans come to the realisation that they are part of the greater community, respect for nature will always elude us.

2.5 Autonomy of Nature

One principle of ethics is autonomy. Persons are deemed to be having autonomy on the basis of their nature as rational and moral beings. It means having rights. Moderate environmentalists like WWF seems to believe that nature has rights. The strongest argument for rights is interrelatedness in communities, which is the basis for assigning rights to nature. Garrett Hardin (1977) considers interrelatedness but interprets it narrowly. He considers rights as rules of competition. Every right is a ploy in the struggle for existence, and every right implies an obligation to furnish it. This is good as far as it goes. However, life is more than competition, it involves cooperation and play. So, rights are rather formal rules for living together. It is foolish not to assign rights to animals, plants and the earth because of contractual formalities.

The destruction of nature by humanity's technology and greed imposed and superimposed by DDT and other persistent chemicals, is a frightening thought. What many environmentalists know is that DDT spraying is immoral and constitute a crime against nature. But, what is our moral obligation in this regard? Kant believes that moral obligations are categorical imperatives. What he means is that moral obligations are inescapable whether one likes what one is morally obliged to do, or not. With this in mind, one can argue that spraying with DDT to control malaria is morally unacceptable. Morally speaking, it follows then that to stop DDT spraying is non-optional, whether one likes it or not. The argument in this case being that DDT undermines the autonomy of nature, and takes away the rights of animals to live. It is wrong when one fails to do what one is morally obliged to do, i.e. not to spray with

DDT, whether one wants to do it or not. Kant's imperatives also implies that moral obligations are justificationally inescapable. If one is morally obliged not to endanger or threaten the stability and integrity of the ecosystem by not spraying with DDT, then one has overriding justification for not doing it. There can be no adequate justification for doing what is wrong.

Plumwood (1991: 147) also favours this autonomy-based approach. Moral consideration, she suggests, should be extended to anything which has an interest or good of its own, that is to anything "having a good, or end, or direction, to which it tends or which it strives, and which is its own". There are many natural systems, including inorganic ones, which have a natural directedness, and on this basis, as Plumwood goes on to observe, the net of moral consideration will be cast very wide indeed.

To the extent that rocks and mountains, in particular or in general, are expressions of ongoing processes which have directions, they may satisfy this condition, and ecosystems clearly do possess broadly teleological properties (Plumwood 1991: 147). Smallpox, malaria, HIV, etc., no doubt have their own viral autonomy (as well as being the products of natural historical processes), so we will be wrong if we deny them a place in the scheme of things, if we only appeal to a value system which favours humans. Plumwood allows that in casting the moral net widely, we will have to "make distinctions for appropriate treatment within each class of items" (Plumwood 1991: 147). Thompson believes it is wrong if we ignore the importance of different levels of organisation, because they all have a teleological importance (Thompson 1990: 152).

Humans ought to understand that no meaningful interaction can dominate without sad consequences. As humans activities expand, coupled with the infiltration of the territory of other non-human beings, there is bound to be conflict, a deadly conflict as in the case of malaria by the infective female anophelene mosquito. Hence people like Dave Norman came up with this type of diabolical, insensitive statements such as: "No Compromise in Defence of Mother Earth" (WWF News, 2001). Whether humans die or not, they had asked for it. Humans are accused of theft and pilfering of natural resources, so it is good that malaria is bringing sanity to this world. DDT is not a

solution, they contend. Rather, the population explosion is the problem. The exploding human population is arguably the most important factor responsible for current destruction of the environment. Ehrlich and Ehrlich explain that humans command almost 40% of potential terrestrial NPP (net primary production ... the sun's energy converted into plant tissue through photosynthesis). The other 5 million species (a very conservative estimate) must make do with the remaining 60% of NPP. With the human population likely to double within the next century, this projects a claim on 80% of the NPP... obviously an untenable situation (Ehrlich and Ehrlich 1988: 23). Reducing the population growth rate therefore appears to be one of the most critical steps towards slowing down environmental destruction (WCED 1987: 56; MacNeil 1990: 114; IUCN 1991: 5).

Charles Wurster, controversial conservationist, goes one step further by welcoming the death of the poor, as their presence on earth poses perpetual death of the ecosystem. He seems to suggest that since humans undermine nature, and are the cause of this degradation, most so because they have failed to give her (nature) respect, and furthermore, because humans have taken away the rights that nature used to enjoy by applying deadly chemicals like DDT and other POPs to the environment, they (humans) deserve the same treatment meted out to mosquitoes and other nonhuman beings, i.e. death. DDT spraying, according to radical environmentalists like Wurster, undermines the autonomy of nature, and it must be stopped irrespective of its consequences to humanity, and in this context poor people.

Wurster has rightly been accused of racism, but no notable conservationist has ever lambasted him for his comments. Therefore, most poor people believe that the banning of DDT which is the only chemical capable of putting a stop to the deadly mosquito is a guise to eliminate them from the face of the earth. Greens and other environmental movement see things differently: they are defending nature against marauding anthropocentric action.

Humanity and other species can only survive if man particularly can cooperate rather than compete with other nonhuman beings. Humanity is an integral part of the food chain and part of an organic cycle of birth and death. Humans need to understand and recognise that they automatically participate in everything, and they cannot

unparticipate by choice. Human nature does not find meaning in an absurd world, but discovers its structure through interaction with the ultrahuman (Rodman 1977: 36).

Humanity's identity exists partly in relation to nature; DDT on the other hand destroys this identity. An act of 'ecological resistance' is an affirmation of the integrity of the naturally diverse self and the world. The meaning of such an act is not exhausted by success or failure in linear sequence of events. One is aligned with the ultimate order of things by ritual action, by the affirmation of the value.

2.6 The Ecocentric Argument

The point of departure of the ecocentric argument is that humans use an incomplete source to determine the value of nonhuman beings, the source is human need. Human needs shape facts. Those facts are a blend of perception, imagination, and needs. Abraham Maslow (1968) established a hierarchy of human needs, beginning with food and continuing through social acceptance to self-actualisation. Vital human needs are based on the health of the earth. Human needs could be extended to include the foundation of wilderness. Nature, which is self supporting and self managing, is a life-support system. Human systems depend on natural ones, for recycling of waste, water and air. Ecology, however, expands the narrow human centred evaluation and sees things from the viewpoint of nature. Natural processes take on an expression of significance of their own without reference to man. All things have a value of their own, regardless of how they are perceived by humans. Accordingly, some environmentalists perceive man as not being the monarchy, and all God's creatures are entitled to democracy, i.e., the choice who they want to be with. Accordingly, the argument goes, humanity needs to rid herself of a jacket of feeling, that of self importance.

Humanity's anthropocentric actions, as seen by the wide use of a discredited chemical like DDT, is stripping the world of qualities and significance and claiming them for themselves (WWF No 139, 2000). By valuing humans alone, we make value subjective, and thus we end up without value. The only way of reclaiming value, is by placing it at the centre of life. Existence is the upholding of value intensity, for itself and shared with the universe, from which it cannot be separated. Everything that

exists has two sides (unfortunately humans seem to think otherwise): its individual self and its signification for the universe. Each aspect is the factor in the other. Whitehead (1967: 83) states: “Remembering the poetic rendering of our concrete experience, we see at once that the element of value, of being valuable, of having value, of being an end in itself, of being something which is for its own sake, must not be omitted in any account of event”. Humans’ value come from knowing what is valuable in nature. Values usually encode information having survival or prestige importance. The most valuable thing is living time, then the experience of life ... aesthetics. That is why humans value walking in the woods or observing and listening to the songbird, or an artist meticulously depicting nature in art. Natural processes are their own purposes and constitute their own value. A growing mosquito or a growing bird just is; it does not have to demonstrate or prove anything.

Perhaps we should not argue that things have value in the human system. Let us just respect the nonhuman system. Bees have bee value, birds have bird value, mosquitoes have mosquito value, trees have trees value, etc. From a functional point of view, all beings are equal. In ecocentric perspective, all beings, humans, birds, mosquitoes, fish, trees, have intrinsic value and are equally important.

Every being thus has value before any utilitarian value to humans. The value of wild nature is its independence and wildness. If humanity can admit the independence of nature that things continue in their own complex way we may feel more respect for nature. We can contemplate with admiration, sense as well as manipulate. The emergence of new moral attitude depends on a more realistic philosophy of nature.

2.7 Ecology Ethic Argument

Because of uncertainty of human actions, which are largely anthropocentric, ethics has to encompass the far past and distant future. No one knew initially that when DDT killed mosquitoes and other non-target species, it would concentrate to kill birds, and even carrions. Values are time dependent, and ecological time can be very long indeed. The futures we invent are viable only if compatible with constraints imposed by evolutionary past. An ecological ethic recognises all human endeavours as part of

nature. We have a moral obligation to leave the world habitable for future generations of humans. An ethics that require a long-range responsibility also requires a new humility. Our technological power exceeds our ability to foresee its consequences.

Leopold had proposed such a conservation ethic, dealing with human relationships to land, plants and animals. People change from conquerors of the land to citizens of the land. Leopold writes that a land ethic “reflects the existence of an ecological conscience from people to the land”, that it is an “extension of the social conscience from people to the land” (Leopold 1949: 209,221). In this scheme, humans only occupy a small portion of the ethical spectrum. According to Leopold, when we see land as a community to which we belong, we will use it with love and respect. Such an ethic would change the human role from master of the earth to plain member of it. Our actions in nature, however, do not contribute to the preservation of the biotic ecosystem. The killing of birds albeit by mistake is not right. If humans did not use chemical sprays such as DDT, surely such mistakes will not occur. What Carson and Leopold thus plead for on behalf of nature is passion and caring for nature. It is not only rational beings who are deserving of moral considerability, but nature has value on its own. Biocentrists attribute intrinsic value to nature, value which is “not dependent on its contributions to the value of another object” (Norton 1987: 151-2). This means that every living thing deserves the ethical treatment generally reserved for humanity. Western culture should therefore extend to nature the rights and respect only recently allowed women, non-whites, and other previously ‘marginal’ groups (Nash 1989; Karr 1990: 245). Biocentrism is a philosophy in neo-Kantian terms that places “environmental objects beyond the reach of cost-benefit analysis”. Nature’s dignity is beyond price and cannot be replaced by anything equivalent (Page 1992: 109).

Exponents of Earth First! and other ecologists have taken Leopold’s land ethic to heart. Their belief epitomises the “quasi-religious transformation leading to an appreciation of diversity for its own sake”, which Ehrlich (1988: 22) suggests may be necessary to preserve environmental health. Such an ethic, if widespread, would certainly go a long way towards advancing the cause of conservation. It remains to be seen, however, whether it is theoretically rigorous enough to provide the basis for viable conservation strategies. An ethic, ecologically speaking, is a limitation on

freedom of action in the struggle for existence. However, an ethic, philosophically speaking, is a differentiation of social from anti-social conduct.

An environmental organization like the WWF that is more moderate in the attack of DDT believes that this chemical ought to be discontinued, but gradually once a non-lethal chemical to replace it is found. On the one hand radical environmental groups such as the Earth First!, Friends of Earth, etc., in their attack of DDT, suggest that humans should avoid tampering with complex evolved systems, not because they are good, but because they are the basis of life at this stage of development.

Ecological ethics is a situational ethics. Because ecology is the study of a changing system, the morality of the act is determined by the current state of the system. Human actions should thus conform to ecological patterns. An ecological ethics is based on attributes of the ecosystem and calls for human compliance with ecological laws: Leave things as they are! According to Leopold (1949: 245): a thing is right when it tends to preserve the integrity and stability of the biotic system. It is wrong when it tends otherwise. Since DDT upsets the integrity of and destabilises the biotic system, it cannot be morally accepted.

The aim of ethics then is to bring about harmony to the whole of the world's population of living beings. Fox (1980) proposes a biospiritual ethic as a unifying set of principles, ethics and values that will bring about a non-conflicting state of one earth, one mind. This ethic is based on the biological fact that all humans and living beings are akin and that life is spiritual ... love is stronger than violence. Human action with regard to callous use of sprays like DDT and other pesticides is thus environmental violence of the greatest order. The banning of DDT and its surrogate chemicals will therefore be a welcome development to the anti-DDT lobbyists of this persuasion.

2.8 Reverence for Being

What kind of world would we inhabit that is without rats, birds, mosquitoes, lions, elephants, etc? Their existence has value, they have functions. Humanity has upset the

balance of nature in favour of itself. Technology will have to correct future activities to reduce the margin between bare survival and social development. The recovery of implicit natural values can therefore be expressed as reverence for the natural system. Laszlo (1972: 34) calls for reverence for the structure of the microhierarchy, including all systems on all levels, from atoms to an emerging planetary culture and ecology: "We can express the recovery of our implicit natural values in requesting a reverence for natural systems" (Laszlo 1972: 34). This reverence expresses the insight that humanity is in nature, and not against nature, as seen by anthropocentric degradation; humanity is part of the embracing network of a dynamic, self-regulating and self-creating process. Marvelling at humanity is marvelling at nature, the matrix from which we arose.

Laszlo argues that reverence must include all natural and artificial beings and things and fields, from atoms to weeds, computers to galaxies. Atoms, molecules, and organic cycles are parts of humanity. We must revere all the arrangements of earth stuff. The greatest human dignity follows from respectfulness of everything as meaningful as us. Such a reverence would treat all substances of the earth as precious, to be used carefully, if at all ... and certainly not for the flood of mass-produced consumer items. Reverence can only be felt at the alienness of nature, not its comfortable conquest.

From this perspective, environmentalists reject the use of DDT as cruel anthropocentrism, and they call for a rejection of technological domination and foster an attitude of letting beings be. Rather than ask for the purpose of existence, we should accept that it exists, in place, in an ecological whole. Every being has a right to exist, an inherent value and is a teleological-centre-of-life and thus it should be able to express itself and seek fulfilment, including birds, fishes, mosquitoes, etc. Death and illness emanating from the deadly mosquito is part of the large ecological cycle: the cycle of life and death. This is what radical environmentalists seem to suggest. They see this as revenge of nature against environmental impunity perpetrated by humanity.

All organisms, including humans, are continuous with nature, and a being is a ground of ethics. Ethics unites humans with nature. Ethics is ultimately grounded in the order of things, the order of creation. Being is universal, everything has value in itself by

virtue of its existence, not moral standing. Therefore every human's action that affects the ultra-human world has significance. There is nothing that does not have value. Therefore, every human action has ethical consequences. The basis of all value is being. It is reality undistorted by human needs. Of course, humanity can still enhance nature with its presence, in a non-exploitable manner. The reverence for beings as they are is the law of non-interference. In nature, the law of non-interference means "letting be" (Heidegger in Wilson, 1984), and "letting alone" (Wilson, 1984), and not killing for pleasure (Fox, 1975). Non-interference is not indifference, which is diffuse. It is caring. Non-interference will not lead to chaos, poverty, and stagnation. The technocratic vision strives for "life under control" (<http://www.uidaho.edu/e-journal/paneco/edesign.html>), utilising every tool and instrument (like DDT) in the service of this ideal, but the earth is self-managing, productive, efficient and orderly.

How then can we preserve our environment? Maybe not every species is sensitive to the presence of humans (mosquitoes tend to like us), but probably every area contains some that are. Therefore, if we are to achieve our goal of not causing extinctions, it follows that we need to set aside at least some land in every area that is off-limits to humans. That may not be sufficient to protect them (cleaning up that land, and preventing, for instance, water pollution are also important), but it is clearly necessary (Foreman, 1991). There are also many other reasons why there need to be some habitat off-limits to humans. Many animals are too dangerous for us to tolerate. Lions, mosquitoes, elephants, poisonous snakes, etc., come to mind. At the rate that we are extinguishing species with chemicals, we don't have time to discover the precise requirements of every species. The best that we can do is to assume that they need what they have had throughout most of their existence: a human-free habitat. And, of course, it is simply selfish for us to claim the entire earth as our domain (Noss, 1984).

According to the Dalai Lama, if really changes are to be made towards a sustainable earth, we need to see the importance of all things on earth. He articulates this urgency beautifully by stating:

The Earth, our mother is telling us to behave. All around, signs of nature's limitations abound. Moreover the environment crisis currently underway, involves all of humanity, making national boundaries of secondary importance.

If we develop good and considerate qualities within our own minds, our activities will naturally cease to threaten the continued survival of life on Earth. By protecting the natural environment and working to forever halt the degradation of our planet we will also show respect for Earth's human descendants - our future generations - as well as for the natural right to life of all of Earth's living. If we care for nature, it can be rich, bountiful, and inexhaustibly sustainable.

It is important that we forgive the destruction of the past and recognise that it was produced by ignorance. At the same time, we should re-examine, from an ethical perspective, what kind of world we inherited, what we are responsible for and what we will pass on to coming generations.

It is my deep felt hope that we find solutions which will match the marvels of science and technology for the current tragedies of human starvation and the extinct life forms.

We have responsibility, as well as the capacity, to protect the Earth's habitats - its animals, plants, insects, and even micro-organisms. If they are to be known by future generations, as we have known them, we must act now. Let us all work together to preserve and safeguard our world: (<http://darwin.biouci.edu/sustain/global/sensem/S98>)

2.9 Conclusion

What this chapter has highlighted is that nature and humanity are clearly on the defensive as a result of humans' chauvinistic and anthropocentric domineering culture, which clearly wreaks havoc and untold misery to the fragile ecosystem. The deaths of wildlife and the accompanying threat of cancer and other ailments to humans suggest that humanity revisit their role in the scheme of things. All these problems could be traced to the human culture of dominance which is both religious

and secular. It is unfortunate that when humans unleashed DDT on the market his/her technological power exceeded his/her ability to foresee its consequences. This can be prevented by immediately banning DDT as some environmentalists demand.

The notion that humans are the centre of everything, clearly indicate that humans' social conscience is fast disappearing into obscurity. Humans need to extend their social conscience from people to land. The argument in this debate have also shown that everything has value in itself by virtue of its existence, not moral standing. Humans' action have ethical consequences. The interference of humanity on the ecosystem undermines the stability and integrity of the biotic system, which by implication is denying the future generations the freedom to opportunities and benefits that nature bestows. But this freedom also implies that humanity minimises his/her impact on the environment and preserve environmental freedom for generations to come. However, what was also shown is that humans' presence in nature is welcomed because his/her presence enhances nature in a non-exploitable manner.

But DDT spraying was also shown to be a cruel anthropocentrism, and some environmentalists are even calling for its rejection, and rather letting beings be. Most environmentalists are calling for compassion on the side of humanity by showing restraint and care to nature. Humans' action are unethical, and ethics unites humans with nature and humanity is grounded in ethics. These ethical problems can be resolved if humanity can express the recovery of his/her implicit natural values in requesting reverence for natural systems. This reverence expresses the insight that humanity is in nature, and not against nature. This implies that humanity needs to cooperate with nature rather than engage in competition.

Furthermore, Leopold's land ethic seems to have found favour with most environmentalists, in that he recommends that humanity should see herself as part of the greater community that co-exist with other beings. Some environmentalists have even gone a step further by demanding that a separate land must be made available for other beings where such a land will be out of bounds for humanity. Humanity has to know her/his place so as to avoid contact with dangerous creatures.

The debate on this chapter has also clearly demonstrated that we have a moral obligation to respect our environment and its creatures for the death of one spells the end for the other. The autonomy of nature has been shown to be under attack, the DDT spraying is causing mayhem, though science has yet to prove the alleged negativity associated with the said spraying.

Biocentrists on the other hand seems to think that nature has intrinsic value independent of what humans think. But, nature can only attain the status of importance if and only if humans place value on them. Humans appear to have a mindset that nature has an instrumental value, only there to provide humans' needs. The notion that nature wins and humans lose will forever perpetuate the debate on whether to spray with DDT or not.

The dream of cooperation and that of non-interference by humanity on the ecosystem is gradually being eroded by greed and more greed. Humanity's quest to conquer the universe and his/her immediate environment is a sign of desperation that shows that humans' nature is violent, and the killing game appears to be raging on – killing has become a game of guts.

The only blemish that came out of the debate is the question of racism that has reared its ugly head during the debate by people such as Mr Foreman and Mr Wurster, who have displayed their callous insensitivity to the dying and the dead. The said gentlemen unfortunately will not contribute to finding long lasting solution to this debate as they will be viewed with suspicion by those on the receiving end. It has also left the integrity of the said 'conservationists' blemished.

However, humans' anthropocentric action must not be viewed in isolation. These humans' actions are borne out of the need to defend and protect its own. Is it therefore morally wrong or right to allow people to die so as to preserve nature? Or can humanity simply accept its fate? Or can humanity fight back to preserve its survival? These questions will be answered in the next chapter by those who support the continued use of DDT to control malaria.

Chapter 3

Basic Arguments for the Use of DDT

In this chapter I will explore five arguments that represents pro-arguments for DDT and argue by showing reasons why DDT's continual use must be supported to save millions of lives of poor people. The notion that DDT is taking its toll on wildlife will be challenged by showing that the vilified chemical is not responsible for the atrocities it is suspected to be unleashing. The first two arguments will be followed by the argument that the banning of DDT is not about the preservation/conservation of the environment, but about greed and politics. Whether it is morally wrong or right for one to defend oneself against the infective mosquito will be explored using Paul Taylor's principle of defence as an argument. This chapter will end by arguing for the value of autonomy, by showing that humans ought to be respected because they are autonomous and have a sense of self direction and regulation.

3.1 The general social-political context of the DDT debate

There are few chemicals that are as controversial as DDT. The pesticide is the totemic bad boy of the environmental movements-indeed many of these groups built their reputation and entire organisation on the campaign against it. Carson's for previous books, for instance, before *Silent Spring* were a massive failure. In this book she repeatedly warned that DDT was a dangerous pesticide. Her book was lyrical, and the material on DDT was far from accurate (Beatty1973: 20).

Although in *Silent Spring* Ms. Carson made only a slight reference to some of our vast public health problems, she did write the following: "Only yesterday mankind lived in fear of the scourges of smallpox, cholera and plague that once swept nations before them. Now our major concern is no longer with the disease organisms that once were

omnipresent; sanitation, better living conditions and drugs have given us a high degree of control over infectious disease” (Carson, 1962: 187).

Her statement was partly true because we have indeed conquered many infectious diseases. However, malaria is not one of them, and a death rate of one person every twenty seconds could hardly be considered a ‘high degree of control’. Granted, drugs can cure many diseases after persons have contracted them, but what about that ounce of prevention? Medications are costly and medical facilities are rarely available to people in the vast underdeveloped areas of the world where insect-borne diseases are so prevalent.

Silent Spring is now a required reading in many of the schools in the US and other European countries. Ms. Carson’s anti-DDT attitude has given the young reader a cause to celebrate: “Let’s go after DDT and then everything will be fine again”.

The National Geographic Society also has dubbed the DDT a poisonous pesticide. Its attacks are speculative and only loosely documented. The magazine consistently offers beautiful photographs of Africa, depicting animals, birds and unclad black people in picturesque settings. Their pictures rarely if ever shows the ravages of tropical diseases that the African people must endure. In the areas of Africa, like South Africa, where DDT is used these dreaded diseases are now becoming rare. Since not one death has been reported in Africa that was caused by DDT, and several million people have been saved by it, and since the National Geographic Society takes great delight in photographing Africa, it is difficult to fathom the Society’s insistence and other anti-DDT environmentalists that DDT is unsafe when the World Health Organisation has consistently declared it safe to use.

Unfortunately, much of the poor countries in the world are still under threat and unprotected from this terrible illness, since many are living in malarious areas. Many of these areas are remote and many of the people are nomadic. However, DDT is making headway, and each year fewer and fewer Africans die from this disease. This seems to indicate that the DDT program must continue until malaria is at least eradicated.

Mention the letters DDT to anyone, particularly from the West, and they are likely to recoil in horror. Very few people appreciate the enormous contribution that the chemical made in public health in the past and have very little understanding of its current relevancy to disease control.

An immense accumulation of inaccurate information and emotionalism about pesticides, especially DDT, has placed the world, in an untenable position. Powerful and articulate groups of misguided environmentalists from the West have sought, and doubtless will continue to seek, bans on the use, production and distribution of DDT. These groups attributed a wide range of effects to its use - from thin eggshells to the pollution of mother's milk, from a lack of female fertility to unlinking the food chain. DDT is in fact responsible for none of these things, as will be shown.

Environmentalists today seek a very simple solution to very complex problems. The pollution of the environment is the result of every human activity as well as the whims of nature. It is tragic error to believe that agricultural chemicals are a prime factor in the deterioration of our environment. The indiscriminate suspension, or outright banning of DDT, is a game of dominoes we will live to regret (Beatty 1973: 4).

DDT, because it is a name popularly known to most segments of the public, has been a target. Once this is accomplished, the so-called ecologists will work on hydrocarbons, then organo-phosphates, carbamates, weed killers, and perhaps, even fertilisers will come under the assault of their barrage of misinformation. If this happens, without DDT and other pesticides, our agricultural goals and the health of our citizens will be compromised and our goals for a better life for all will be simply unattainable and starvation and world chaos will result.

There is much more at stake. DDT has frequently been called a health hazard and yet it has saved as many if not more lives than penicillin. The WHO has steadfastly maintained that DDT is the safest, cheapest, and most effective agent in the eradication of insect-borne diseases. "DDT has been the main agent in eradicating malaria in countries whose population totals 550 million people, of having saved five million lives and prevented 100 million illnesses in the first eight years of use, of

having recently reduced the annual malaria death rate in India from 750,000 down to 1,500 and having served at least two billion people in the world without causing the loss of a single life by poisoning from DDT. It is so safe that no ill effects have been observed among the spray men or among the inhabitants of the sprayed areas” (Dr. James Wright in Beatty 1973: 5).

Most environmentalists, particularly self-appointed ecologists without the years of academic study and experience required, continue to make decisions based on half-truths and innuendos. Environmentalists today are like a big swimming pool. Everyone wants to get into the water, but not everyone can swim. The time has come to place things in proper perspective. Tsakane Furumele (an entomologist at Tzaneen Malaria Institute) has expressed her discomfort with the continuing emotionalism against DDT: “For the most part, a one-sided picture has been presented. It is vitally important to people of all nations that we seek the truth”.

Nothing is poison, yet everything is poison. It is all a matter of degree. Even distilled water can kill if too much is drunk too rapidly by an individual who has been lost in the desert for an extended period of time. If a bird were to be fed an excessive amount of regular table salt mixed with its food, the bird would die. At the opposite end of the spectrum, very small amounts of ‘highly poisonous’ arsenic compounds and the common explosive nitro-glycerine are regularly and purposely taken by many human beings with beneficial results. It would be inaccurate to say that DDT is not a poison... it could be if it were improperly used. The same can be said of salt, water, aspirin, nitro-glycerine, ad infinitum (Beatty 1973: 7). Since the well-being of mankind, according to Dr. Norman Borlugh (Nobel Peace Prize winner in 1970, for his efforts to ease world hunger through development of high yield wheat strains) and countless other eminent scientists, is at stake in the controversy over DDT, should we not insist that all judgements on DDT be based upon valid, documented scientific evidence rather than upon the emotional, frenetic, and too often faddish opinions of amateurs? (Beatty 1973: 7).

The Western ‘environmentalists’ that are heavily funded by the Federal government of the US only know a bit of the history of DDT (Tren 2002). Synthesised in 1894, it was only commercially produced shortly before Second World War by Paul Muller,

who was awarded the Nobel Peace Prize for his effort. Its first use in disease control was by the allied force that used it to control typhus and doused hundred of thousands of people in the powder to kill parasites such as lice. It was used throughout Europe and in the Far East (Dunlap 1981: 85). It was highly successful in those countries in eliminating typhus fever and malaria. Then, what is the reason behind calling for its withdrawal and finally being banned? The victims happen to be residents of poor developing countries of the world. Malaria is claiming millions of lives per year more than any other disease combined, yet Western 'environmentalists' are steadfastly calling for its banning despite its success in fighting malaria. Worse still, those who are calling for the banning of this chemical are not living in tropical regions of the world where malaria is a menace, and to date they have not come up with a chemical as potent as DDT to control malaria.

This is a sad time for humanity. But it will be even sadder time, if we don't use this opportunity to learn something! We have freedom of speech, but rarely use it, apparently from fear of how we will appear to others. Telling the truth, or what you believe strongly, is so rare that the few who have had the guts to do so have become famous and have changed the world ... for example Carson. Where are the environmentalists in Africa? Where are the ethicists in Africa? Why are they not challenging this myth against DDT by the Western 'conservationists'? Often the truth is staring us in the face, but we ignore it because we are afraid of the consequences.

No one and no one can dispute the fact that malaria is taking its toll in Africa, especially. Bodies are there to be seen and counted. Does this body count matter to the 'outsiders'? As long as those who are dying from malaria are mostly people of colour, the West will as expected not listen and see the carnage. What would have happened if malaria was still prevalent in the rich North? My contention is that the proposed banning of DDT and other persistent organic pollutants (POPs) in 2007 would be postponed *sine die* until an alternative substance is found.

The smell of death in Africa is only felt by Africans. How many deaths does it take to justify assaulting the environment with pesticides? Not many, if they're in New York City. As soon as three people died from encephalitis, public officials and

environmentalists generally agreed that any risk from Malathion were negligible compared to the threat from mosquitoes.

Beyond the city limits, though, the answer seems to be more complicated. While helicopters have been spraying pesticide all over town, negotiators at the United Nations have been debating a proposed global ban on the use of DDT. The ban is opposed by the doctors and researchers who warn that millions of people could die from malaria in countries that can't afford alternatives like malathion and pyrethroids.

Environmentalists say DDT should be banned because it poses special risks, and there's no question that it remains in the environment and in body tissues much longer than malathion. But many scientists doubt that DDT is much more hazardous than malathion is. In fact, the debate over the chemicals may turn as much on public relations and politics as on science.

The proposed DDT ban is the result of the long crusade by journalists, environmentalists and public officials, most of them living in New York and other malaria-free environments along the East Coast. It began with in 1962, when *the New Yorker* serialised Rachel Carson's *Silent Spring*

Environmentalists maintain that malaria can be controlled by other means, even in poor countries, but the disease rate has soared in many places since DDT spraying stopped. Defenders of DDT have tried to dramatise the situation with letters, petitions and Internet Web page (www.junkscience.com/ddtfaq.html), featuring "Rachel Carson's Legacy of Death", presented as a malaria clock that adds a new fatality every 10.5 seconds. "The great thing about DDT, for poor countries, is that it's dirt cheap and lasts a long time, Dr. Ames said. "The United States doesn't need it, because we have better alternatives. Malathion is clearly preferable for us because it degrades so quickly in the environment and in the body. But not everyone can afford it". So, what is the real story here? Poor countries have since taken up radical positions, like South Africa. They are importing that "elixir of death" in order to save millions of dying South Africans. They have decided that the West can either put up or shut up. They can keep their expensive chemicals to control pests in their countries, and we will keep our own DDT which is tried and tested. The West is seen as

dictatorial by victims of malaria scourge, and as a result people have decided to turn deaf to the Western demands that this chemical be banned. The people's attitude have hardened, and they seem to suggest that they will never ever allow neo-colonialism to dictate their lives. The West must understand that applying a principle of "one shoe fits all" will boomerang. Poor countries will not listen anymore. It is their people who are dying, and not the rich, affluent people. Tsakane Furumele, an entomologist at Tzaneen Malaria Institute has this to say about anti-DDT lobbyists: "Get off our case. We know what is good for us. It is either you are with us, or against us".

This clearly shows that the more the richer countries demand the total ban of DDT without providing alternative relief, the more radical people of colour will become. Already there is simmering tensions between the North and the South, which has totally eroded the little trust which used to exist. In the final analysis Western demands that this chemical be banned is seen as a reincarnation of the holocaust that must be resisted at all costs. Humans see themselves as superior and sentient, and have God's given permission to rule over all other things. On the other hand non-humans only become important to humans by virtue of humans attaching value to them, because he benefits from them as they have instrumental value.

There is no *prima facie* evidence that suggests that DDT has killed or is killing humans and wildlife, save to say that these allegations are fables which are baseless, dangerous and riddled with lots of scientific inaccuracies.

As long as humans' status are relegated below that of non-humans, the strife that led to the 'calcification' of attitude between warring factions will continue in the foreseeable future. The deadly debate currently brewing amongst different factions must be addressed so as to meaningfully address these problems and save human lives. As long as this debate continues, humans onslaught by infective mosquito will continue, so is the body count. It is my observation therefore that the heated positions of radical stances for DDT need to be relativised by a thorough rational analysis of the arguments for DDT. The following section will argue for the continued use of DDT, and show with reasons why DDT is not the ugly monster it is purported to be.

3.2 Human health and DDT

Man's greatest biological enemies have always been and continue to be disease and hunger. Of the countless diseases that have plagued man, insect-borne diseases remain today the most difficult to control. Malaria is still the number one killer of mankind. It affects one-sixth of the human race today, killing one person every twenty seconds. Malaria is a disease which has plagued mankind for centuries. One of its many nasty side effects is that it has a tendency to return for a second bout with those victims who did not die in the first round. Malaria causes chills, extremely high fever, extensive liver and kidney damage, repeated attacks, and death.

The female anophelene mosquitoes, which carry malaria, are the bug world's equivalent to vampires. They too suck blood for food. What happens is a chain reaction: An infected mosquito bites a healthy person, introducing swarms of malaria parasites into his or her bloodstream. After a short incubation period the person develops malaria. Healthy mosquitoes then bite this now malarious person and having sucked some of his or her blood, rests on the wall inside the house for two or three days to digest their meal. During this period of time these previously healthy mosquitoes become carriers of malaria, and when their hunger pangs strike again, they fly off to bite other people. Thus they continue the destructive chain. Once malaria breaks out in an area, it can spread like wildfire.

The best known way to break the chain is to spray the walls and ceilings of houses with DDT. This procedure kills the resting mosquitoes and prevents them from adding new links to the chain. By 1968, the United States had spent more than half a billion dollars to help control malaria throughout the world. As a result, more than 960 million people who a few years ago were in constant danger from malaria are now free of the disease because DDT can effectively kill anophelene mosquitoes (Beatty 1973: 10). But does the WHO recommend the continued use of DDT? Since about one percent of the anophelene mosquitoes have built up resistance to DDT, the WHO recommends the use of malathion in these few resistant areas; but advises that strict precautionary measures be taken.

Rachel Carson's book *Silent Spring*, published in 1962, lit the anti-DDT torch. Ms. Carson stated on page 25 that the malaria-carrying mosquitoes had become resistant to DDT. According to Roy F. Fritz, a scientist/entomologist, Vector biology and Control, WHO, at the present time one percent of the world's population lives in areas where mosquito resistance to DDT has limited its use. He writes: "Obviously we must never stop our research and our checks on pesticides; however, it would be equally foolhardy to discontinue the use of a pesticide that is demonstrably safe and effective in 99 percent of the world when properly used" (Fritz in Beatty 1973: 14).

In 1962 a shocking event occurred in a Binghamton, New York, hospital. Seven newborn infants died mysteriously after they were fed a widely used chemical by mistake. The chemical was added to their formula accidentally. Was the chemical arsenic, strychnine, or one of the highly toxic organic insecticides? No, it was common salt, added to the formula under the impression that it was sugar (Whitten 1966: 81).

This regrettable incident illustrates one fact that physicians and experts on the effects of poisons emphasise over and over in any discussion of the question of the danger of pesticides: any substance can be poisonous if consumed in large enough quantities. Furthermore, everyone consumes small quantities of naturally occurring substances that are often considered poisonous in practically every meal.

No one has made this point clearer than William J. Darby, who was then a chairman of the Department of Biochemistry and director of the Division of Nutrition in Nashville. In the hearings conducted in 1963 by Senator Abraham Ribicoff of Connecticut, and Senate subcommittee, Dr Darby stated:

Many substances which occur naturally in common foods are regularly ingested without evidence of harm. Among such toxic materials are solanine in potatoes, other saponins in soya beets, spinach, peanuts, calabash, tomatoes, oranges, and so on forth; ...arsenic in shrimp and oysters; antitrypsin in beans, phytic acid and phytates in variety of foodstuff, cyanides in cassava, almond, and so fort ...The use of foods containing these is such that the toxic

substance is ingested at an amount which we would define as a 'permissible level' if we were considering a food chemical purposely incorporated into food or a pesticide residue ...

The natural state of a foodstuff does not assure wholesomeness as is so often implied by misled faddists. Indeed, we possess much more information on the biologic role of most chemicals added to foods than we do on such naturally occurring components, even those which may become injurious (Dr Darby in Whitten 1966: 82).

Such information is not cited by those who want to see DDT banned. Darby's statement is not meant to frighten fish eaters or even vegetarians. It is merely to put into perspective the whole question of the effect of tiny amounts of pesticide residue in the diet.

It must however be stressed here that many pesticides are highly dangerous to man and they must not be consumed indiscriminately. Some are even dangerous if they merely come into contact with the skin, for the skin absorbs them, e.g. benzene. They should be kept out of reach for children. Well and said, pesticides are safe when used properly. No one ought to avoid household chemicals for fear that a minute whiff will send them into convulsions or cause some apparently unrelated disease years later.

Before DDT was used during Second World War, it underwent extraordinary tests, while being developed. And its safety is apparently forgotten. Not only animals were fed the chemical but human volunteers too. A man was given a dose of 500 milligrams (mg) of DDT in Florida without ill effects. This was the equivalent of only about 17.5 thousandths of an ounce, but for a chemical of the insect-killing power of DDT it was quite a dose. Later the scientists gave the same man about 27 thousandths of an ounce, again without harm (Whitten 1966: 83). People only got sick if they ingested about 10 mg per kilogram of their weight and convulsions occur frequently when the dosage is 16mg/kg or greater. People have however recovered in a surprising number of cases where DDT was substituted for flour in pancakes and the like (Whitten 1966: 84). There is no question however that DDT causes death. But in most cases where DDT was not responsible for the death, it was implicated in most

cases as the cause of death, while products like bleach, detergents, soaps, and cleaners were responsible.

Could it be that pesticides like DDT causes cancer, leukaemia, liver disease, loss of mental power, genetic damage is difficult to know, as Carson (1962) explains: “Their presence is no less ominous because it is formless and obscure, no less frightening because it is simply impossible to predict the effects of lifetime exposure to chemical and physical agents that are not part of the biological experience to man”. It is suspected that many of the diseases currently affecting humans could be those that are naturally occurring in the environment. It could be naturally occurring pesticides that could be responsible for chronic illnesses in humans. Yes, the environmentalists may take me up on this one, because they would in any case demand proof that naturally occurring substances may be responsible. On the other hand I could also say the same. There is no proof to date that suggests that DDT is responsible for this mayhem put forward by the environmentalists.

One fact no expert can dispute is that small amounts of DDT and probably other pesticides are being stored in most people’s tissues. Scientists first reported this in 1951, and every new study since then has confirmed the finding. People in rural areas of the Kwazulu-Natal and some part of Limpopo Province are only exposed to about 2 mg of DDT which is sprayed on the internal walls of their huts. We have yet not received nor heard of any deleterious effects emanating from spraying with DDT.

Are pesticides the cause of human cancer? Ms. Carson devoted a chapter of *Silent Spring* to try and show that indeed pesticide can cause cancer in humans. She quoted an American Cancer Society that 45 million Americans now living will eventually develop cancer - apparently the source for her chapter title, “One in Every Four”, since the death rate she mentions is 15 percent, or a little more than one in every seven (Whitten 1966: 94). The suggestion is a grave one. What is the answer? The answer is some pesticides are carcinogenic, or cancer causing, and some are not. However, no residues of those that are carcinogenic are permitted on foods. When it was suggested by someone that DDT might cause polio, the possibility was considered and the lack of evidence was noted; when the polio vaccines were

developed, such claims subsided (Whitten 1966: 95). No matter what the source of suspicion, it is the responsibility of professional toxicologists to explore each possibility.

However it is important to realise that there is no conclusive evidence that pesticides, old and new, are a cause of any disease except poisoning. Indeed people who were spraying with DDT did not develop cancer? It seems to follow, therefore, that DDT does not cause cancer. Cancer of the bladder for instance has been traced to certain dyes on the basis of studies of workers exposed to them. No such findings, however, have been discovered with pesticides (Whitten 1966: 97).

Contrary to popular belief, DDT has been found to have curative properties on cancer, but the effect was not considered strong enough to be useful. However, a close relative of DDT, DDD, has been used in the treatment of tumours of the adrenal cortex. Tumours similar to those produced in rats can also develop from overfeeding them (Whitten 1966: 97). According to Whitten (1966: 99), aldrin and dieldrin produce liver tumours in mice, but since the tumours are benign the pesticides are not regarded as carcinogenous.

Cancer studies which were conducted in America and elsewhere have lamentably failed to point DDT as a cause of cancer. Dr Hayes continued:

We can synthetically produce leukaemia in rats by a special purified diet, which we had wished to use for certain experimental reasons. The leukaemia was transmissible from rat to rat, and we have sent rats up to NIH (National Institutes of Health) for further study to determine whether a virus is responsible for it.

In some instances the cause of cancer in animals has been proved to be certain chemicals. In other instances it has been proved just as positively that cancer was caused by viruses. The relation between this is still largely unexplored, but is being investigated.

There are experts in the cancer field who feel that it is just a matter of time and hard work until cancer in people, as it occurs in the

general population, and as it has occurred as a serious disease of man as long as we have known about it, will be traced to a virus infection (Dr Hayes in Whitten 1966: 101).

One more witness before the Ribicoff hearings might be cited to answer some of the charges against pesticides. He is Charles Henri Hine, Associate Clinical Professor of Preventive (Occupational) Medicine and Toxicology at the University of California School of Medicine. On Dr. Hargraves' theory that pesticides cause blood disorder, Dr. Hine said:

I have to disagree with my colleague, Dr. Hargraves. I do not think, in most instances, there is a good-cause-and-effect relationship With the blood dyscrasias (disorder). I think this is relatively rare with The insecticides (Hine in Whitten 1966: 101)

On the suggestion that DDT and other pesticides affect reproduction and cause mutations, Dr Hine commented:

I know of no evidence at the present time which would suggest there is any risk of this nature. Experiments on animals have indicated that high concentrations of the materials may produce a decreased number of surviving young. However, the majority of tests have indicated that there is no effect in this direction at concentrations which are likely to be met by man (Hine in Whitten 1966: 101).

Of the suggestion that pesticides are responsible for cases of general malaise, a feeling of decreased efficiency, general weakness, and tiredness, Hine replied:

The ubiquity of these symptoms among the population in general and the lack of relation to any specific environmental exposure has in my opinion negated any relationship (Hine in Whitten 1966: 101).

And on the suggestion that pesticides aggravate underlying disease Hine states:

There is no reasonable medical evidence which would substantiate this conclusion (Hine in Whitten 1966: 101)

What do these conclusions tell us? DDT is not a monster as painted by the Western ‘conservationists’. So, those who are calling for the total ban of this chemical are showing their immaturity and their callous disregard for the crying mother whose child soul is slowly departing from that tiny body. This is a typical example of being anti-anthropocentric to such an extent that the dying, poor people of the world, people of colour do not matter. Their death is long overdue. My contention is that the death of anti-anthropocentrism is long overdue.

3.3 DDT and Wildlife

Most people have a special affection for the creatures of the earth that exist independent of man. People who live in urban residential areas try to attract birds to their yards just because their song and activities give pleasure. The rapidly soaring numbers of people who observe birds and animals in the wild as a hobby and who spend their vacations camping in parks and forests doubtless have similar feelings

“This special sentiment for untamed things appears to be the reason that one of the principal issues in the pesticides debate is the effect on wildlife. Because of deep seated emotions are involved many people pay no attention to facts, or pick up only those facts that suit their convictions” (Whitten 1966: 109). A single dead robin can be evidence of criminal poisoning of the environment and an unfortunate miscalculation in a pest-eradication campaign.

Despite the doom and gloom predicted by Carson on the use of pesticides, wildlife populations all over the world are bigger and healthier than ever, not in spite of pesticides, but in many cases because of them. According to Whitten (1966: 110-111), “the thing that most conservationists and nature lovers seem to forget,” he says, “is that most cultural practices are the best friend wildlife has, and I am including pesticides use. On our land, a successful insect-control program helps us produce yield that are double or even treble what they used to be. Consequently we’ve been able to cut back our cotton acreage drastically ... now there is more game on our land than ever before, including deer, a species that disappeared in the thirties. In addition, we’ve damned up a bayou for irrigation purposes, drilled a deep well, and created a very good duck lake as a by-product.”

A number of pesticides disasters that have been reported in the past, were found to be unfounded, exaggerated (Tsakane Furumele). The wildlife poisoning that did occur were invariably the result of misuse or negligence, not the inevitable result of prescribed application.

Most pro-DDT lobbyists that I spoke to in Limpopo and Mpumalanga Parks Board, believe that in the past most of the bird mortality were attributed to lack of diet, and prey as well as Newcastle disease and botulism rather than DDT or any other pesticide for that matter. Some birds died as a result of cold weather. It is common in South Africa that 60 to 80 percent of bird mortality is as a result of low temperature. It is common for birds which are having a high birth rate (Anonymous Park Board Official - Mpumalanga).

Some of the wildlife which were suspected to have died from DDT exposure, were as a matter of fact, victims of veld fires. However, even the wildlife which was suspected to be extinct were later discovered to have moved into other areas in search of food. The whole story about extinction is seen in this context, as nothing else but “chemophobia”.

From laboratory studies, it appears, there is much that is not known about how to interpret a finding that a certain level of a certain kind of insecticide in the diet does or does not kill certain birds. The effect of DDT, for instance, amalgamated with food – for example earthworms – was more lethal to woodcocks than pure doses of DDT. But “birds” in good condition could scarcely be killed by oral doses of DDT, even massive ones. Some succumbed to smaller space serial doses, but only when these were accompanied by starvation rations. Only malnourished birds died in most cases (Whitten 1966: 117). The egg fertility and survival of the young, was not affected by the DDT, but by their hyper-activity (BBC News, 2001). But many human and environmental stressors can contribute to thin egg shells. Laboratory experiments purporting to link DDT with egg shell thinning involved massive doses of the chemical, far in excess of what occurred in the wild.

Moreover, the bald eagle and falcon populations were already rebounding during the peak years of DDT use - thanks to law limiting their hunting. DDT is not a carcinogenic hazard to man ... DDT is not a mutagenic or teratogenic hazard to man ... The use of DDT under regulations involved here does not have a deleterious effect on fresh water fish, estuarine organisms, wild birds or other wildlife (Whitten 1966: 104)

With regard to fish and DDT, it has been found that fish in inland lakes and other areas where pesticides are extensively used have stored 40 times as much pesticide in their fat as the fish that supposedly were killed by pesticides in the Mississippi river in 1963. Yet these lake fish were plump and lively. Studies of fish at Mississippi State University showed that fish over several generations develop a genetic resistance to pesticides just as insects do (The Centre for Science and Environment, July 26, 2002). Do spraying lakes and marshes for mosquito control always harm fish and wildlife? Many people seem to think so, but there are ways to do it without harm. It has been shown repeatedly that insecticides can be used on water safely by using proper materials at proper dosages at the right time. The recommended application is 0.2 pounds of DDT per acre for single treatment and 0.1 pounds per acre for repeated treatments, with malathion at 0.2 pounds per acre as an alternative (Whitten 1966: 117).

The bottom line is, therefore, if used correctly, DDT is a life saver against mosquitoes. Bad things which were said about this miracle chemical in the newspapers, and by some environmental fanatics like Foreman, are unfounded and short of hypocrisy.

In South Africa, each time fishes are found dying or dead in the rivers, pesticides are always implicated before an environmental audit can be conducted. But as the case later developed, it is in most cases discovered that the culprit is a virus that is responsible for this toll. As is always the case with reckless charges, the charges attract more attention than the effort to correct it. Doubtless to say that such incidents damage the credibility of pesticides, as was the case with *Silent Spring*.

Massive fish kills, were known to occur long before the invention of DDT and other chemicals. Old generations, would always say that God was angry, for mankind was over-fishing. God wanted people to starve so as to bring stability in the dams and rivers. The death of such fishes was believed to be caused by a fish virus, which was like Aids. But it will not kill all fishes, but people will be scared to hunt down the few remaining, fishes. They will wait for the population to recover before they resume fishing again. There were no chemical used then. Can we therefore still blame pesticides?

3.4 Rich Nations versus Poor Nations/Nature Versus Human Health

Do the rich countries have the right to make a decision to ban DDT when such a decision would have such far-reaching consequences, and would obviously affect the future economic and social well-being of so many nations of the world? Often we hear people say, "Live and let live". Should we not say instead, "Live and help live" (Beatty 1973: 23). America and other Western countries are not safe from malaria anymore. They may have eradicated malaria in their countries, but it should also be remembered that they are frequent visitors to endemic countries. They are also vulnerable to these diseases, and they can and do bring them back to USA and other Western countries. Will the same countries continue the ban of DDT if problems of malaria reappear in a lightning speed in their own countries?

Politics seems to seep into every phase of our living. It is unfortunate that it must influence the production of DDT, but we can hope that our politicians will listen to facts rather than fiction. They might well consider the political consequences of the rich affluent North's ban on DDT. After using DDT to eradicate malaria from our own land, can we deny other countries the use of the pesticide that helped the Americans and other Northern countries (New York Times, March 1983)?

Denying the people who are stricken by malaria the choice to use DDT is denying the people the future. Since the 1940s DDT has become the weapon of choice against malaria. It is an affordable, readily supplied and instantly lethal poison to the

mosquitoes that carry the malaria-causing protozoa. DDT application, typically on the inside walls of houses where the disease is endemic, indisputably saves lives.

Considering the known and the suspected dangers to human health and wildlife, it would be nice to be able to ban DDT immediately. But banning it, without providing adequate alternatives, would be ruinously unfair to those who suffer the worst from malaria – the poor, in poor countries. Can we take to heart the ‘dirty war’ against DDT by the greens and the millions it killed and is still killing? Are human’s lives less important than the mosquitoes or the environment as it were?

Moral Anthropocentrists are of the view that the only beings that have moral standings (i.e. intrinsic value) are humans. Accordingly Baxter describes his view as follows: “My criteria are oriented to people, not penguins. Damage to penguins, or sugar canes, or geological marvel is, without more, simply irrelevant. One must go further, by my criteria, and say: Penguins are important because people enjoy seeing them walk about rocks; and furthermore, the well-being of people would be less impaired by halting the use of DDT than giving up penguins. In short, my observation about environmental problems will be people oriented, as are my criteria. I have no interest in preserving penguins for their own sake” (Baxter 1995: 149).

Thus, Baxter advocates a purely cost benefit approach to making environmental decisions (to spray or not to spray with DDT) where costs and benefits are determined relative to human ends. Baxter states four ends by which environmental decisions can be assessed, namely:

- i. Human freedom should be maximised so that each person should be free to do whatever he/she wishes in the contexts where his actions do not interfere with the interest of other human beings.
- ii. Waste should be avoided,
- iii. Human dignity should be respected; in other words, every human being should be treated as an end rather than as a means to be used for the betterment of others, and
- iv. Opportunities for each person to increase his/her share of resources should be maximised (Baxter 1995: 149).

Baxter believes only people have intrinsic importance, and his sentiments are shared by lots of other people. He gives or offers two reasons why humans have moral worth, than nonhuman beings:

- Only human beings can express their preference “insofar as we act collectively, only humans can be afforded an opportunity to participate in the collective decision. Penguins cannot vote now and are unlikely subjects for the franchise - pine trees more unlikely still (Baxter 1995: 149).
- Only humans can ask what ought to be the case. Only humans have the ability to understand right and wrong, and control their own behaviour.

Birds, mosquitoes, fish etc. are, according to this argument, incapable of loving and do not have the capacity to think. Why, therefore, must we concern ourselves with ugly insects that torment and kill us in millions? Many anti-DDT environmentalists, have had a great deal of hyperbole deployed in articulating the claims that destructive human activity, such as spraying with DDT, are threatening the life of the planet; that we are disrupting the delicate fabric of the ecosphere, and driving it toward collapse. Such claims are exaggerated. There have been far more traumatic disruptions to the planet than any we can initiate. From a long-term planetary perspective, this is alarmist nonsense.

If the concerns for humanity and nonhuman species raised by advocates of deep ecology, like the Earth First! are expressed as concerns about the fate of the planet, then these concerns are misplaced. From a planetary perspective, we may be entering a phase of mass extinction of the magnitude of the Cretaceous. For planet earth that is just another incident in a four and a half billion year saga. Life will go on - in some guise or other, whether DDT will be present or not, whether mosquitoes will be extinct or not. Other organisms like the algae, bacteria, arthropods, will be still around in billion years hopefully. And with luck some creatures like us will still be around, for a while longer.

Of course, our present disruptive and destructive activities are, should be, of great concern to us all. But that is quite properly a human concern, expressing an

anthropocentric perspective. Life will definitely continue, as it has for billion of years. However we need to take steps to maintain and preserve our sort of living planet; one that suits us, with a few exceptions, our biotic co-existence. Anthropocentrism is thus natural and inevitable, and when properly qualified, it turns out to be perfectly benign.

Nature in and of itself is not, I suggest, something to be valued independently of human interests. It could be argued moreover that in thus modifying our natural environment, we would be following the precedent of three billion years of organic evolution, since according to the Gaia hypothesis of Lovelock (1979), the atmosphere and oceans are not just biological products, but biological constructions.

Environmentalists have proposed natural properties such as biodiversity, beauty, harmony, stability, and integrity as non-anthropocentric basis for value. But unless we smuggle in some anthropocentric bearings, they fare no better than the property of being the outcome of a natural process in providing an intuitively plausible ordering of better and worse states of the world. We therefore need humans to help give some anthropocentric bearings to determine which of the abundant and wonderfully various unfolding planetary biotas should be preferred (Lovelock 1979)

Poor people should in the final analysis have a final say in determining whether DDT must be banned or not. The rich and heavily funded environmentalists do not have the right to put a price on the lives of millions of dying poor people. If people feel threatened by the presence of mosquitoes, they have the right to defend themselves. Defending oneself is a universal principle, and it is right.

In the next section, I will show that the principle of self defence can also be defended from a non-anthropocentric point of view.

3.5 Taylor's Principle of Self Defence

According to Paul Taylor, the principle of self defence becomes operative in those cases where nonhuman beings and organisms are a direct threat to humans. For example, it is morally permissible for one to kill a mosquito if it is about to bite me ...

or is it? According to Taylor, this principle covers only those cases where such a threat could not be avoided. However situations where humans put themselves in danger because it is their job, e.g., snake hunters or because they are thrill-seekers are not intended to be covered by this principle.

If I go looking for dangerous animals, Taylor would argue, then it is not morally permissible for me to kill one when I find it, notwithstanding the imminent danger to me, owing to the fact that such danger could quite easily have been avoided (Taylor 1995: 125-139) However in the case of mosquito bite, humans do not go looking for mosquitoes, but mosquitoes do. The kind of case that Taylor has in mind is one where a human being encounters a dangerous non-human beings or organism, where such an encounter is quite accidental, and where the only recourse is to kill the mosquito that threatens non-human beings or organisms.

Taylor points out that this principle is akin to our principle of self defence in the criminal law. No one is expected to sacrifice himself to another person. However, there is a problem with this principle as it applies to nonhuman animals and organisms. How serious does the threat have to be? A mosquito sting is harmful, and quite painful, but does it mean it warrants the death of mosquito? It is simply not clear where we have to draw the line here.

One might claim that excessive force should not be applied to such situations. Perhaps we should defend ourselves to the point where such defence wards off or subdues the attacker and not beyond that. However, there will be cases where any defence spells the death of an organism. As Nolt has pointed out the danger posed by pneumonia is not so great as to be life threatening in the young. One could survive pneumonia without taking antibiotics. Taking antibiotics, spells death for the bacteria. At minimum, Taylor's principle cannot resolve such cases.

Does the mosquito ever express compassion for the devastation that it has caused, is causing and will be causing in future? No, because it does not have the capacity to feel compassionate towards humans. Therefore the obligation to respect every species in nature even those that do harm to us is not justified. It follows, therefore, that

humans have a right to defend and kill in some instances to protect his/her own kind and his/her freedom.

Mosquitoes have become resistant to some chemicals like pyrethroids, particularly the *anopheles funestus* species. Malathion on the other hand is expensive and out of reach to most poor counties. The only chemical available is DDT, which for all intent and purposes repel the mosquitoes once they get too dangerously close to human habitat. Human self defence in this case obviously only targets the infective, female mosquitoes. If, obviously, for one reason or the other, these insects were not infective, humans will have no excuse to eliminate them. Humans are only defending themselves, to ensure survival of its species. Humans don't go out and hunt these little creatures nor hunt them for thrill or even for consumption. But these insects are hunting humans for consumption. They need humans' blood for survival. It is therefore ethically justifiable, in terms of Taylor's argument, to eradicate those harmful species that threaten our lives and prevent us from achieving our telos (IUCN 1991: 15)

Finally it is not humans' endeavour to eradicate all mosquitoes. Humans are only targeting hostile mosquitoes that thrive at the expense of human's life and suffering. I don't believe that mosquitoes are sentient, and therefore they do not qualify to be classified as having moral considerability since they cannot be held criminally responsible for their actions.

3.6 DDT in a Planetary-geological Perspective

Some nature advocates or anti-anthropocentrists may counter that this lack of responsibility does not disqualify animals and organisms as holder of rights, even if they can't return the favour. Human babies for instance have rights but no responsibilities. To which, as we have seen, it can be answered that babies have rights because they have human potential: they are only 'defective' or incomplete members of the species to which rights belong. Sometimes nature advocates will offer another explanation, such as that all species possess 'inherent' rights simply because they exist, because they are living creatures and all living creatures have rights.

A great deal of hyperbole has been deployed in articulating the claims of some radical environmentalists. It is common for example, to counter claims that destructive human activity, and in particular human technology that introduced DDT in the environment, is threatening life on the planet; that we are disrupting the delicate fabric of the ecosphere, and driving it towards collapse. Such claims are exaggerated. There have been far more traumatic natural disruptions to the planet than any we can initiate.

If the concerns for humanity and nonhuman species raised by advocates of nature are expressed as concerns about the fate of the planet, then these concerns are misplaced. From a planetary perspective, we may be entering a phase of mass extinction of the magnitude experienced billion of years ago. Life will go on after or during DDT debate, in some guise or other.

The arthropods, algae, and the viruses, bacteria, and so on will certainly be around for few billion years more. And with luck and good management, some of the more complex and interesting creatures, such as us, may continue for a while longer as well. Of course our present disruptive and destructive activities are, or should be, of great concern to us all. But that is quite properly human concern, expressing anthropocentric values from anthropocentric perspectives. Life will continue; but we should take steps to maintain and preserve our sort of living planet; one that suits us and, with a few exceptions, our biotic co-existence.

The traumatic disruption to planet brought about by natural forces far exceeds anything which we have been able to effect. What DDT does to the environment is far less than what natural disaster could do. Consider, first what Lovelock (1979: 68) has called the worst atmospheric pollution incident ever; the accumulation of that toxic and corrosive gas oxygen some two billion years ago, with devastating consequences for the then predominant anaerobic life forms. Or the Cretaceous extinction 65 million years ago, which eliminated an estimated 96 percent of marine species. Like the eruption of Mt St Helens, these were natural events; but it is implausible to suppose that they be valued for that reason alone.

There is of course an excellent reason for us to retrospectively evaluate these great planetary disruptions positively from our current position in planetary history, and that is that we can recognise their occurrence as a necessary condition for our own existence. But what could be more anthropocentric than that? However, as Gould (1989: 36) has pointed out, mass extinction is awful for those who are caught in them.

If such periodic disruptions events are natural and good all right, they however nonetheless destroy most of the large forms of life. These times of renewal provide on the one hand opportunities for smaller, flexible organisms to radiate opportunistically into vacated niches. On the other hand the man's intervention by way of spraying with the DDT, also provide an opportunity for humans to recover their health which was compromised by malaria and help sustain their health. The radical environmentalists on the other hand disagree with this notion that human intervention in nature will bring sanity; rather they see his demise as providing comparable opportunities for development which we currently prevent. Should we, in such circumstances, step aside so that evolution can continue on its majestic course? I think not, and I think further that interference with natural course of events if it could be affected, would not be a bad thing at least from an anthropocentric point of view and in terms of our interests, which it is quite legitimate to promote and favour.

Suppose that we are entering one of the periodic epochs of reduced solar energy flux. An ice age is imminent, with massive disruptions to the agricultural productive temperate zones. However, suppose further that by carefully controlled emissions of greenhouse gases it would be possible to maintain a stable and productive agriculture. No doubt this would be to the detriment of various arctic plant and animal species, but I do not think that such interference, though 'unnatural' would be therefore deplorable. Nature in and of itself is not, I suggest, something to be valued independently of human interests. It could thus be argued moreover that in thus modifying our natural environment to be liveable by getting rid of troublesome mosquitoes, we would be following the precedent of three billion years of organic evolution, since; according to the Gaia hypothesis of Lovelock (1979: 43), the atmosphere and oceans are not just biological products, but biological constructions.

Natural properties such as biodiversity, beauty, harmony, stability, and integrity are the non-anthropocentric basis for value. But unless we smuggle in some anthropocentric bearings, they fare no better than the property of being the outcome of a natural process in providing an intuitively plausible ordering of better worse states of the world. For example, if biodiversity is taken as a basic value-giving characteristic, then the state of the planet just after the Cambrian explosion (about 570 million years ago) would be rated much more highly than the world of the present, as it was far richer in terms of the range and diversity of its constituent creatures. Therefore we can only rank preferences if and only if we give some anthropocentric bearings (Lovelock 1979: 43-48).

3.7 The Value of Autonomy

Rodman proposed a notion of autonomy wherein he proposed that: "One ought not treat with disrespect or use as a means anything that has a telos or end of its own - anything that is autonomous in the basic sense of having a capacity for internal self direction and self regulation (Rodman 1983: 90). The anti-DDT proponents are highly against DDT which saves millions of lives every year in poor developing countries. The fact that the Western countries are prescribing to the rest of the world that is reeling from the effects of malaria is beyond my comprehension. This is a total lack of respect to dead, dying and sick people of colour.

Humans, of course, have the ability for moral consideration, and are also autonomous. Plumwood (1991: 147) suggests that moral consideration should be extended to anything, including humans, which has an interest or good of its own, that is: to anything "having a good, or end, or direction, to which it tends or which it strives, and which is its own". For the fact that some environmentalists are calling for the death of some people to 'bring sanity' to the world by banning DDT defies logic. Yes, mosquitoes have no doubt their own protozoan autonomy (as well as being the products of natural historical processes), but for all that is perfectly legitimate to regard their interest when they conflict with our own. Yet it is also difficult to deny them a place in the scheme of things, except to appeal to a value system which favours human interests. Plumwood (1991: 147) seems to agree that in deciding who is important or worthy of being classified as having intrinsic value, one shall have to

cast the net far to include anything so as to “make distinctions for appropriate treatment within each class of items”. It seems reasonable to suspect that human standards of appropriateness will be brought to bear to settle cases where conflicts arise.

Thus every human being has a moral responsibility to act in a responsible way towards the environment. Although this may impose certain restrictions on personal freedom, it is just as much of a civil obligation as refraining from stealing or mugging. It is in humanity’s long-run interest to avoid environmental destructive behaviour, yet it would be a tragedy of massive proportions if humans are excluded as a part of a broader community in the environment. The anti-DDT proponents must understand that humans have survived the greatest catastrophes meted out by nature, and yet they came out unscathed.

The notion of trying to attach negative sentiments to every human’s action is therefore wrong. The environment needs man, and man needs the environment. Lets join hands and save not only penguins, BUT mankind. By doing so we will be saving civilisation.

3.8 Conclusion

Given this heated debate on whether to spray or not to spray with DDT, it follows that both parties need each other like never before to narrow areas of disagreement, and look for win-win solutions. It is often said that when two elephant bulls fight, the grass suffers. In the final analysis, the poor people – people of colour, bore the brunt of these disagreements. Wrangling and finger pointing by these opposing factions will surely not bring relief to the dying. What is real though is that the poor continues to die whilst politician and governments are failing to see the atrocity and carnage that is unfolding.

The pro-DDT arguments have shown that DDT is not the only menace to the environment. Anything if not properly used or is eaten in greater proportion would kill, as is ordinary table salt. Wildlife’ deaths have not only been attributed to DDT,

but some fish virus and other wildlife were at the brink of extinction not because of DDT, but because of over-hunting.

Humans and other species were shown to have defied natural catastrophes, and survive the might of nature. How can we therefore allow poor people of colour to die whilst a chemical as potent as DDT is available. Humans are autonomous and are therefore deserving of respect and moral considerability.

What we have also learnt in this debate is that there is no *prima facie* evidence scientific or otherwise that has attributed the death of humans or wildlife to DDT. It is just emotions running high by those who are anti-anthropocentric. It also appear as if there is a ploy to discredit DDT by the Western countries because they are unaffected by this plague.

However this does not imply that all is lost and forgotten. We can still make a difference by co-operating to halt this march to destruction. Either way, we shall have to find common grounds where nonsense is replaced by common sense. The following chapter will try and suggest possible solutions which hopefully will find favour with both factions, i.e. the anti-DDT and the pro-DDT proponents.

Chapter 4

Suggested Solution

In this chapter four solutions will be explored which will try to look at ways in which to strike a balance between the two warring factions, i.e. between anti-DDT proponents and pro-DDT proponents. Scientific research on DDT will be explored as a possible solution to verify its efficacy and possibly its harm to the natural system and to humans' health. The said scientific research findings will be made available to the warring factions to review their debate on DDT, and hopefully such results will ignite a meaningful discussion between the two parties which hopefully will lead to consensus. Biological control will form the basis of the second solution wherein natural agents will be used as an alternative to chemical usage to control these mosquito-carrying malaria also be discussed. Stewardship as an environmental solution will form the basis of the solution where humans actions and responsibility come under scrutiny. And lastly the principle of utility as a solution will be addressed wherein we look at the benefits of spraying as against the cost of spraying.

4.1. Scientific Research

Something that will kill bugs also kills animals, even man. This sounds logical enough, but isn't necessarily true. However it is difficult to convince some folks of that. And when DDT first hit the civilian market, many people were afraid to handle it. This, in part, was due to the fact that DDT was a relatively new material and neither the manufacturers themselves nor the government agencies that were working with it had had sufficient time to learn about it.

Since no one has ever died from DDT poisoning, it is difficult to say just what a toxic dose is. It would be on the same breath suicidal to leave one with the impression that DDT is harmless to man and the environment and other nonhuman beings. It will poison and eventually kill if a lot of it is eaten over a long period of time.

Pseudo-scientists believe that in general, when an animal gets too much DDT he loses his appetite, his nervous system goes haywire, and he gets the tremors, and finally, if he has had a sufficiently large dose, he gets convulsions and dies. Autopsies usually reveal fatty degeneration of the liver and kidneys and changes in the nervous system, but with no apparent damage to the brain and spinal cord. But this requires a massive dose of from 150 to 750 milligrams of DDT per kilogram of body weight (Zimmerman and Lavine 1946: 51).

And there it is – DDT, one of the most lethal, and certainly one of the most important of the insect killers that man has developed for use against his insect enemies. Is it a final weapon –the weapon that will win the war for mankind? Certainly not! No one claims that it is! Against some bugs it is ineffective. Against many others it is less effective than other pesticides already in use like malathion, pyrethroids, etc. But against many other obnoxious insect enemies it is the most effective substance yet developed.

When properly formulated and applied, DDT will protect man against malaria, and rid his house/home of mosquitoes and other insects. Yes, it will do all these things and it will do many more. But, does this mean that with the advent of DDT these insects are doomed to extinction? Can man look forward to an insect-free world? Hardly! Insects have existed for millions of years, and they have shown remarkable ability to adjust themselves to new conditions. Otherwise they could not have survived. The development of new poisons for the control of insects is usually followed thereafter by the appearance of more resistant strains. And when certain insects are driven from a locality, others, perhaps even new species, come in to take their place.

The early, over-optimistic pictures painted by some of the most sensational journalists when DDT first made its appearance were often based on wishful thinking, not upon facts. Because people could be free from the mosquito threat, and since practically all insect life could be killed, people began to dream of an insect free world.

But those who were most loud in their heralding of the “miracle” insecticide, were the first to swing in the opposite direction and belittle the value of the material whose praise they had formerly sung (Zimmerman and Levine 1946: 145). Thus again, we

saw a repetition of the common cycle of events that has accompanied the discovery of every cure for the ills of mankind. A few decades ago sulphur drugs were hailed as the wonder healers for which the world had so long been waiting for in anticipation. These drugs were to wipe out every known disease that had impacted on humans negatively, that is according to some “prophets of doom”. Then penicillin followed and captured the imagination of every person, including the environmentalists, especially those from the West. Yet, the magic drug kept on eluding scientists. All of these drugs have certain uses and limitations, so is DDT. The men who knew much about them were most conservative in their predictions. They were not responsible for the many rash statements that the public so easily followed (Zimmerman and Levine 1946: 145).

It is the same with DDT again. It was heralded as the magic killer, but alas, it was not the silver bullet it was purported to be, which will put an end to all insects life that threatens humanity’s existence. And, as in the case of the medicinal world, those who had the most to do with the development of DDT insecticides were not the ones who made the fantastic claims.

Let us examine DDT on the basis of what it has done and it can do in poor countries. Denying the poor access to DDT is reminiscent of the colonial era, when blacks were simply left to die in agony, because they were perceived as subhuman. It is the prerogative of the countries affected with malaria to decide whether DDT is a poison which warrants immediate ban, or whether it is a miracle chemical to keep it as the only viable chemical to save poor nations from an almost guaranteed death. When we take this rational point of view, we are led, inevitably, to the conclusion that the development of DDT was the greatest contribution to the field of insecticides since that day in 1869 when man first began to use poison in his fight against his external enemies - the enemies that fly, that crawl, and that hop; and yet are so small that it is hard for us to believe that some day they may, if we weaken our guard, inherit the earth (Zimmerman and Levine 1946: 146).

People from rich countries must understand that somehow *Silent Spring*, which they read so avidly, is not a balanced account of the place of pesticides in the world. They must know that its conclusions are not endorsed by the vast majority of scientists and

physicians with the background to judge. They must realise that it is a polemic, not a prophecy (Whitten 1966: 209).

Of course, DDT is poisonous. It must be treated with respect. It must be kept out of the reach of children and it must never be stored with food and other food products. And most importantly, it must always be labelled, to obviate accidental ingestion of this chemical. The chemical should furthermore be applied in accordance with the instructions on the label. The chemical must and should be used only by trained personnel for indoor spraying, and agricultural spraying must for the time being be prohibited.

In Southern Africa, there is a widespread resistance of anopheles mosquitoes to carbamates and also to synthetic pyrethroids. Reduction in the choice that malaria control officers have in which insecticide to use hampers their ability to effectively control the disease and the end of the day this endangers lives.

What is perhaps more worrying is that many of the environmentalists campaigners are calling for bans and restrictions on a global basis. This clearly ignores the fact that economies, environments and more particularly disease and methods to control them differ from country to country. For sub-Saharan Africa to implement policies that are applicable to Mexico or China would be completely inappropriate and again would result in an enormous number of lives being lost or endangered.

Malaria policies in the past that were based on global standards – such as the WHO Malaria Eradication Programme failed precisely because of the assumption that one size does fit all. For the environmentalists groups to have conducted their campaign on the basis that what is good for one region must surely be good for another. This was not true in the past and it is difficult to see how it could be true now.

The incorporation of the precautionary principle in international agreements and as a guideline for policy makers is another change in environmental policy that can impact on public health policy. There are many definitions of the precautionary principle – perhaps the most widely used is:

When an activity raises threats of harm to human health or the

environment, precautionary measures should be taken even if some cause and effect relationships are not established scientifically (Tren 2002).

Greenpeace have their own definition: “Do not admit a substance until you have proof that it will not do harm to the environment” (<http://darwin.bio.uci.edu/sustain/global/sensem/S98/Ohara/EnvEthics.html>).

However this definition is highly misanthropic as it totally ignores the damage the non-use of the said pesticide will do to human health. On the face of it, the precautionary principle may seem like a sensible policy – however in reality its application and its effects are not well thought through. It is impossible to prove that a substance or new technology will not have a negative impact and so what the precautionary principle does is to allow for the halting or banning of technologies almost at the whim of the regulators. In the final analysis it is not the regulators who are dying of malaria, but ordinary people in poor countries. Given the lobbying power of the green groups, this is a very worrying factor for those who are interested in public health and see the need for the development of new products and technologies for disease control.

The precautionary principle ignores the fact that on balance, new technologies bring about greater benefits than they do costs. It also removes the decision making power from those that would be most affected by the technology. The poor and the illiterate nations of the world are never consulted on whether they see the need for new technology or whether they consider the banning of an existing technology to be justified.

If the concern about DDT is also its effect on human health, there is no scientific proof that DDT has killed or is killing millions of people the way malaria is. It would therefore be tragic, for instance, to let the conditions for an insect-borne epidemic arise simply because of vague fears over possible adverse side effects of pesticides. There is no evidence that the small amounts of chemical residues found in human tissues have any effect on human health. The average life expectancy has increased twenty years since 1910, since the introduction of DDT (<http://www.newaus.com.au/news> 40.html). Despite claims to the contrary, DDT is the wonder drug of the century. It is one of the least dangerous poisons available to

the public. For about thirty years hundreds of people had been employed in spraying it without any ill-effects, during which it saved millions of lives. In fact, DDT was no more poisonous to people than aspirin. This is not to suggest that DDT, along with other insecticides, should be thoughtlessly used, only that it be used intelligently, as in the case of Kwa-Zulu-Natal Province and Limpopo Province, where it is used for indoor spraying only.

Whenever a case of pesticide poisoning occurs, its symptoms are clearly marked and are closely associated with the exposure. There is no indication that pesticides are responsible for cancer or leukaemia or any other disease. And happily, there are signs the research will soon find a way to reduce greatly the poisonous effects that do sometimes occur when pesticides are improperly used (<http://www.newaus.com.au/news40.html>).

While pesticide such as DDT is allegedly responsible for the high mortality of fish and wildlife, this has been built out of proportion. In South Africa, DDT reintroduction has been based on the premise that it will only be used to spray internal walls of huts and houses. Agricultural spraying with DDT is still outlawed. However pesticide applications cover such a small part of the land supporting wildlife that the vast majority is completely unaffected. Where DDT is used/was used wildlife losses are mostly temporary. Indeed, the areas where DDT is used most heavily, it supports a thriving wildlife population, with some kinds of birds reaching to such an extent numbers that they are serious pests and must be controlled (<http://home.pacbell.net/mjvande/scb4.htm>).

If it was possible to do without pesticides, every human, farmers, public health officials would gladly leave them alone. Pesticides cost money, and nobody uses a potential hazardous chemical for its own sake. DDT is a means to an end.

But while research into the ways of controlling insects and other creatures that man regards as pests has shown some great promise over the last few years, it will take some time before pesticidal chemicals are no longer required. DDT at the moment still remains humanity's best friend. A century of accelerating research has found nonchemical ways to control a few pests and disease. But our homes, huts, farms, are

still abounding with enemies that will seize the slightest chance to lay waste to entire crops, and endanger public health. The weapon we have in DDT has helped us cope with these foes, and it will be morally unjustifiable if this chemical is banned without providing an alternative drug, and leave millions more people exposed to the worst illness, malaria.

We shall have to continue using DDT for the time being until the hoped-for nonchemical weapons are ready to take their place. Dee Belveal in Whitten (1966: 211) put the magnitude of pests in excellent perspective:

People are much concerned these days with the threat of nuclear warfare; the fear that mankind may be destroyed and this planet blown into dust by the hydrogen bomb. The concern is well justified, and yet there is another threat to survival that is almost as dreadful and much closer. The danger does not await the poised finger of an irresponsible dictator; it is not held in abeyance by diplomats around a conference table; or by threat of retaliation ...

The enemy is already here in the skies; in the fields, and waterways. It is dug into every square foot of our earth; it has invaded homes, schoolhouses, public buildings, it has poisoned food and water; it brings sickness and death by germ warfare to countless millions of people every year ...

The enemy within - these walking, crawling, jumping, flying pests destroy more crops than drought and floods. They destroy more buildings than fire. They are responsible for many of the most dreaded disease of man and his domestic animals: malaria, yellow fever, dengue, sleeping sickness, and many others. Twenty-one classifications of insects are now in active existence. Some of them eat or attack everything man owns or produces - including man himself.

The American legislation which was used to ban DDT must not be applied universally, even in countries which are reeling from the setbacks of losing millions of its people. We can rather have an international act which will prescribe regulation of DDT and other POPs. America and the West must not arouse public alarm without adequate reasons. DDT producers found guilty of gross mishandling of materials

should be penalised. DDT is to be used only internally to spray walls of huts and not for agriculture. We hope this will appease the Western environmentalists and their governments who are sponsoring them. By this it is believed that no chemical will be blown to other countries, and the amount of DDT that will be used internally will only be about 2 grams per household.

The Northern countries must co-operate with the South to improve their cooperation in matters relating to pesticides. The mentality of one size fits all must be done away with and rationality allowed to prevail. They could exchange scientific information pertaining to the efficiency of the pesticide as well as guarding against polluting the atmosphere. But poor people must not be made to suffer. They have the right like anyone else to live a life which contributes to their peaceful existence. In short a happy life that the West perceive as unthreatening.

There should also be an increased awareness of duty to the poor countries by the rich countries. Their duty must not be motivated by financial greed, but by compassion to save lives especially children below the age of 5 years. In fact, poor countries should be the ones who decide whether DDT ought to be banned or not since they are the ones who feel the brunt of malaria.

Meanwhile, insects are developing immunity to some of the pesticides now in use. Until foolproof ways are found to prevent insects from detoxifying these materials, a succession of insecticides seems to be the only answer. Otherwise we may find ourselves where we were before the arrival of DDT, lacking an essential weapon to oppose a return of malaria which has been rendered impotent by DDT.

We must continue research about pesticide so that we may protect our health and those of future persons, and be ready to meet the demands which will be put on our economies, particularly those from disadvantaged countries. We must not permit anyone, environmentalists and “prophets of doom” to saddle our future and that of the future persons with the burden of the unknown. We don’t know for sure that DDT is carcinogenic; therefore, this calls for donor countries to put aside funds to study the long term effects of DDT and other pesticides.

Since DDT is claimed to persist in the soil for more than 30 years, studies must be undertaken to authenticate this claim. No amateurs must be called in to determine humanity's destiny, at the expense of professional scientists. We must and cannot afford the luxury of restricting the use of DDT, our best weapon against malaria and other insect-borne diseases. We must abolish once and for all the notion to force doctors, malariologists, entomologists and those engaged in health to prove the worth of their tools and working materials: to prove that they do not cause that for which even our best researchers, physicians, and scientists do not know the cause (Whitten 1966: 215).

We must be ready with new weapons and new methods; in the meantime we must not give up those we have. For if we do follow this latter policy, we might as well say our good byes to Mother Earth.

Policy makers and countries who are calling for the banning of DDT should not be biased against this chemical. They should retrospectively also talk about the miracles this chemical has brought to civilisation. It is unfortunate that rich countries use their economic and political might to determine the fate of poor countries. South Africa like other countries are on the receiving end of governments and radical environmental groups such as Earth First! who want to dictate and shape the health and life of poor people from overseas. Those unreasonable demands on the part of those governments to have DDT banned smacks of racism of the greatest order. To link the release of social grants to poor countries with discontinuing the use of DDT is surely criminal to say the least. Poor people's lives seem to be more cheap than a mere mosquito.

Environmental groups like the Earth First! Greenpeace, Friend of the Earth, et al, have been consistent in their quest to discredit DDT such that their consistency has become more inconsistent in that they are no longer against DDT, but are now fighting poor people of colour. It appears as if they are no longer playing the ball, but the man. They must put their money where their mouth is, that is in research, and help provide an alternative drug that will at least result in preventing the body count, emanating from the malaria scourge. The money that they waste on their propaganda against DDT can best be utilised to save lives in African countries. They could rather use

their influence in the rich North to channel more money in malaria research and DDT studies.

There are more problems in the Northern countries which are sparked by the arms race. The threat of a nuclear bomb is looming in the struggle between Pakistan and India, and that threat is real. The DDT threat is minimal compared to other threats, such as diseases which are spread by mosquitoes. People who are calling for the banning of DDT, are not living in tropical regions where malaria share a bed with the inhabitants there, and they have in any case used this chemical successfully in their countries to prevent their soldiers and crops from the devastating effects of insect-borne diseases. The demand of the West to ban DDT is therefore simply cheap politics. If they are so serious about this proposed banning, they should provide expertise, and alternative chemicals to fight humanity 21st Century disaster. Instead, however, we often see in Africa how this politics is used as a tool to threaten poor people. A case in point is South Africa that has experienced how donor countries insist on this country banning DDT before they released social grants. This is tantamount to hostage taking and demanding ransom, which translates as the death of poor non-white people, like Wurster suggested.

DDT's poisonous effects on the environment and wildlife are without foundation, fabricated and misleading. People who made such wild allegations are not scientists, yet they manage to stage a coup d'état on an unsuspecting public. Let's leave story telling to dreamers and science to scientists. As long as there are no positive linkages between DDT and wildlife, human health, etc., there is no basis therefore to consider the banning of DDT. If properly used, DDT, like any other chemical, is safe. DDT is a chemical, and if wrongly used will of course result in death.

According to Whitten (1966: 215): "One controversial book has jolted us into re-evaluating man's entire relationship within his environment", and he continues: "But let us pledge that we will accept the facts, but not the fantasy, of *Silent Spring*. The general public must indeed be made to realise that man's environment is a combination of everything that has gone before, and that it will continue to be changed. Natural disaster appears to be more devastating to the environment, than

man's anthropocentric nature. What happened and where are the dinosaurs? Was it man who caused that extinction? No! It was natural disaster”?

Pinchot (1947) believed that the human race was to live on earth, and control its resources with conservation, meaning the greatest good for the greatest number for the longest time. Man is part of nature, though in most cases he is called upon to build himself a synthetic environment, free from nonhuman beings and environmental threats. In fact, everything about man is as the result of converting natural elements into products of use to him, e.g. his clothing, food, housing, etc. However mosquitoes are interfering with this telos. Man is therefore in the light of this, justified in defending himself against any threat that threatens his existence, by using any available method to save his skin and that of his own.

Man should not expect miracles to cure him of malaria, nor worry about the minute traces of minor elements that his ingenuity enables him to identify. Rather, he should interest himself in what is significant. It is not how little can be measured, but the effects that counts. We must remember that all the chemicals that are used to control pests in our homes, schools, airports, etc. are toxic. If they were not, they will not be effective. The real concern therefore should be to keep toxicity at safer levels, without sacrificing the means of protecting public health, the comfort and convenience of the housewife and the homeowner.

We must therefore require standard tests to determine “legal” tolerance. Legal tolerance must not be greater than the amount which has been determined by responsible agencies to be absolutely safe for use. Minute quantities of residue certainly do not constitute a danger to life and health.

We must use all our known weapons, like DDT, as we spend millions every year in our quest to find new ones, if we are to enable man to keep that important one step ahead in his continuing contest with insect and disease, with pest and pestilence.

DDT at the present moment is the only hope for Africa, presently subjected to the hardship of malaria. It is the only chemical capable of adding more years to humanity and brings dignity that was unceremoniously taken away by mosquitoes.

4.2 Biological Control

A primitive way of dealing with the menace of mosquitoes, which was applied sometime ago, was the effective usage of mosquitofish. Mosquitoefishes (i.e. fishes which were used in the past before the advent of chemical control, to control mosquito breeding places mostly in swimming pools) have been proved to be effective and efficient in various mosquito breeding habitats as they fed on the larvae, thereby denying the larvae from becoming an adult mosquito. Fishes have become an alternative to pesticides today for environmentalists.

However, this method of control is reliant upon sufficient water levels existing for the fish to survive and access any larval mosquitoes present. Although an eventual drydown may eliminate the fish from an area, the area should be considered for stocking if a few months of larval control can be achieved.

However, these predators are more effective in some situations than others. They generally work quite well in unused swimming pools, abandoned sewage lagoons, mine pits and permanently flooded stormwater facilities. Other larval habitats do not consistently provide a suitable site for some fish stocking, but at times exhibit the proper characteristic that enable stocking to occur. These sites included freshwater swamps, ditches and woodland pools.

A healthy fish population must be maintained to ensure that larval mosquitoes are sufficiently controlled. However, Anopheles mosquitoes are particularly hard for mosquitofish to control when emergent vegetation provides them harbourage. The area wherein fishes are going to be introduced should be a documented mosquito producer. The area should be contained so that fishes cannot escape. The area should further be monitored to follow the progress of the fish.

However, this method of mosquito control will be hard to implement and control in rural areas where the land is vast and there are no swimming pools in sight. The said predators can in turn be a meal for the hungry poor people. This method may work in the Western setup, because their lives are not dictated by poverty.

4.3 Stewardship as a Solution

Homo sapiens need to respect nature, and as such, humans should intervene in a protective way as responsible stewards, when necessary to protect the environment. Carson rightly pointed out the perils of disrupting natural communities, and recognised that inevitably society will attempt to manipulate nature by this technology.

Indeed, the anthropocentric goal of spraying with DDT will influence the way in which intervention takes place for the long range benefits of humans as well as other residents of the ecosystem. This tendency, however, equally places a duty on humans to protect and preserve nature. In this regard, saving habitat is not enough. In order to survive, we must assure the preservation of many elements of the ecosystem. After all, nature is composed of much more than trees or birds, or fishes or ants. It also contains many creatures, including soil bacteria that, together, form a web of life.

We should therefore seek to protect all forms of life, not only those we love or which capture our imagination - such as dolphins, sharks, birds, elephants, lion, etc., but also more obscure creatures. The web of life depends on variety of species, including earthworms, insects, and bacteria. These species need our good stewardship as much, if not more than do the creatures that we perceive as having intrinsic value. Our actions, therefore to control mosquitoes, should not be directed towards total elimination of mosquitoes, but merely to repel their attack on our homes.

Mosquitoes have a mosquito function in the web of life. Some may also argue they have inherent value independent of what humans think of them. Yes, some are killers like anophelene. So, are me and you? Love them or hate them they are here to stay. Repel their attack rather than killing them. It is a human thing to do.

4.4. A Utilitarian Solution

Most attempts to spray with DDT appear to be supported by utilitarian philosophy. This argument outlines the importance of spraying against the benefit that humanity

will enjoy. If the costs of spraying exceeds the benefits, spraying with DDT will of course not be recommended. On the other hand if the benefits of spraying far outweighs the costs, spraying should be allowed, i.e., the greatest good for the greatest number.

The costs of spraying include the loss of life, pain and suffering to birds, fishes, mosquitoes, bees, etc., and a negative impact to the environment. However, the benefits of spraying include the protection of humans against the infective mosquitoes that transmit malaria. What a utilitarian account calls for is thus that despite the fact that nonhuman and the environment have interests humans are taken into account more than the nonhuman beings. This is because humans can express themselves and argue their case, whilst nonhuman cannot do the same. Therefore this argument is biased against nonhuman beings, since they cannot express their feelings or even vote for that matter. Therefore cost benefit analysis will always be in favour of humans (King 1991: 64).

This utilitarian view is based on the belief that humans can identify and quantify the factors which influence his moral judgements, and that a positive cost-benefit ratio necessarily has a positive moral value. This system reduces wildlife to a mere commodity, just there for the human taking and exploitation. In this manner, utilitarians simply relegate morality to a simple cost-benefit analysis. DDT spraying would therefore be seen as an effective method used to control mosquito carried diseases, though it could be argued that it is not cost effective in terms of time considerations, because it requires that sprayers need to cover large areas and need to undergo rigorous training which might take some time, and thus is in effect a very expensive exercise. Many anti-DDT lobbyists, however would oppose this utilitarian approach, arguing that spraying in itself is a cruel method of achieving humanitarian ends, since it kills non-target organisms as well, and by that treat them unjustly.

However, an advantage of utilitarian is that it provides a method for decision-making when whatever humans do will have harmful consequences. In short, it allows humans to choose the better of the evils. Humans, I would argue, should strive though to give equal consideration to all components of the ecosystem. Humans, after all are part of the greater community.

A utilitarian approach also assists humans to evaluate the impact of their activities on the environment so as to make an informed decision prior to engaging in some activities, on whether to spray or not to spray. This approach is imperative as it assists humans to take rational decisions. A word of caution should be sounded, however, by appealing that such a utilitarian approach should be applied with utmost caution. After all, man does not have the capacity to predict all the consequences of his actions, and disaster has often been the result of his actions. This in the final analysis impedes humans to make an accurate cost benefit analysis (Moriarty and Woods 1997: 394).

4.5 Conclusion

In this chapter it was argued that the heated positions of radical stances for DDT need to be relativised by a thorough rational analysis. The radical environmentalists were advised not to allow themselves to be ruled by emotions, but by facts on the ground. They at least need to show some compassion to the dead and the dying. The question of whether DDT is the evil it is alleged to be must also be investigated, and the answer determined on sound factual grounds. It was further argued that we need to find a balance which hopefully will lead to a gradual phase-out of DDT and other POPs whilst not endangering the lives of the poor people further. The West's attempts to universalise the banning of DDT should be done with caution and humility after consultation with affected and interested parties.

This chapter has clearly demonstrated that DDT is not the evil is purported to be. It is in fact a life saver to the poor and the dying, exposed to the risks of malaria. However, what this chapter allude to is that no one knows for sure the extent of the damage DDT or any chemical exert on the ecosystem. As long as no alternative chemical is found which is more environmentally friendly, people who need it should be allowed to use it – albeit under strict control.

The West's threats of economic sanctions against those countries who want or have reintroduced DDT should be challenged. The situations in the two worlds are not the same. Therefore, the notion of wanting to impose Western standards to the rest of the

world must be condemned. That DDT has proved its worth in the fight against malaria cannot be challenged. On the other hand its destabilising effect on the environment has not been proved. The hype, exaggeration and distortions on this chemical will not save lives. The research on this chemical and dialogue with affected and interested groups should take the front seat. It is the only way to go.

Chapter 5

Conclusion

Almost any decision in life involves trade-offs. Very rarely do we face clear-cut choices where the answer to a dilemma is clearly the best and the only choice. Environmental decisions are no exception to this. Nearly every decision has pros and cons that must be reconciled. So, what about the DDT dilemma: banned worldwide over three decades ago but still used (or needed) by poor nations to fight malaria. Both opposing streams involved in the debate appear to be tenaciously holding on to their position despite heavy costs in terms of health of the people, and the alleged damage the chemical DDT causes to the environment.

The harmful consequences of widespread use in any quantity of any substance in the natural environment may not be predictable with our current state of knowledge. Well planned monitoring for possible harmful effects of chemicals in use will remain essential for the foreseeable future. Even where environmental damage is possible or has been observed, benefits (such as elimination of disease) may be sufficient to justify careful use of a chemical

What can we learn from this expensive dilemma? As long as we simply rush untested technology to the environment and accept it with fanfare, we are bound to engage our energies to useless debate about such technology. The DDT controversy has been raging on for more than 30 years, yet nature lovers and pro-DDT lobbyists continue to vilify and scorn each other.

What are the true facts here, is that malaria, an ancient disease that was once effectively controlled by the use of DDT between the mid 1950s to late 1960s has made a deadly comeback with other fatal varieties like dengue. According to WHO there were between 300 and 500 million people with acute cases of malaria in 1998, and approximately 2,7 million deaths. In Africa alone 3000 people die of malaria every day (<http://www.moer.org/more15.htm>).

The World Health Organisation credits DDT with saving 50,000,000 lives. And DDT has not even accounted for any human's fatality. DDT today is outlawed in the name of protecting wildlife and the environment. The ultra left green agenda of the environmental movement have become political tools for governments who want to enforce the banning of DDT. Politics appear to be used as a yardstick to determine the future of the poor nations. For instance a developed country like Germany, where the green lobby is politically powerful, used its presidency of the European Union (1999) to back the demands for a ban on DDT and probably a UN treaty may finally implement such a ban in 2006 or 2007 (<http://www.moer.org/more15.htm>).

In the face of such a politically powerful onslaught against the use of DDT by governments and organisations such as WWF, EDF (Environmental Defence Fund), Earth First! etc., the developing countries in the South had an increase of more than 500 percent of malaria after abandoning DDT.

Other factors do contribute to the emergence of malaria, like social, political and climate changes in the South, but none equals the influence of the decreasing use of DDT. In Africa alone, banning of DDT has jeopardised the health of millions of people in malaria endemic countries.

Studies have shown that countries who have never sprayed with DDT or those who stopped using the chemical had an increase in malaria cases of more than 90 percent. And those countries that lowered their DDT spray rates in the mid-1990s, in keeping with the new WHO Global Malaria Control Strategy, all experienced a rise in malaria of nearly 40 percent (<http://www.moer.org/more15.htm>).

South Africa has refused to give in to pressure to withdraw DDT for internal wall spraying, and has since enjoyed a more than 80 percent decrease in cases of malaria. From the preceding argument it is very clear that growth in malaria incidence corresponds with changes in the global strategies for malaria control and that there is clearly a link between decreased use of DDT and increased lethal malaria.

I do share the sentiments of the Greens that DDT has some negative effects on the environment, though scientific investigations are inconclusive in this regard, and that

DDT may cause some limited non-lethal injury to people. As far as I know, there is no chemical which is not dangerous. However, proper and careful application of any chemical is safe. Ordinary salt can kill if too much of it is ingested, so is DDT. If we agree that DDT is mildly toxic to birds and fish, and that it may possibly cause non-lethal harm to humans, surely that is a tiny price to pay for combating a noxious disease that is becoming worse in the South.

The Western 'environmentalists' are still convinced that DDT application is a short-term approach to help humans against this vector disease, however, the damage to the environment is going to be long-term now that everybody will suffer in the future, in health terms and environmental terms.

The biggest problem today with the rich countries and their surrogate environmental movements, is that they want to eliminate DDT, the best chemical we have for prevention of malaria, without engaging in debate. Their decisions are mostly unilateral, immoral and ethically incorrect. The health of millions of poor people in endemic areas should be given greater consideration before we proceed with the present course of action of restricting or banning DDT.

Poor nations, who are under the onslaught of malaria, should start re-spraying households and the environment with DDT to save lives in thousands without paying attention to any international environmental outrage. The poor nations must also reject with contempt the WHO's Global Strategy to provide individual medical treatment to those suffering from malaria. That is unrealistic, impossible and unavailable, given the economic situations of poor countries, and other factors such as political strife.

The implication that DDT is deadly is completely false. Human volunteers have ingested as much as 35 milligrams of it a day for nearly two years and suffered no adverse effects. Millions of people have lived with DDT intimately during the mosquito spray programs and nobody ever got sick as a result. The National Academy of Science in the USA has concluded that "in a little more than two decades, DDT has prevented 500 million (human) deaths that would otherwise have been inevitable" (<http://21stcenturysciencetech.com/articles/summit02/Carson.html>).

The World Health Organisation acknowledges that DDT has killed more insects and saved more people than any other substance. A leading British Scientist pointed out that “if the pressure groups had succeeded, if there had been a world ban on DDT, then Rachel Carson and *Silent Spring* would now be killing more people in a single year than Hitler killed in his whole holocaust”

(<http://21stcenturysciencetech.com/articles/summit02/carson.html>).

It is a travesty, therefore if Rachel Carson’s all out attack on DDT results in any programs lauding her efforts to ban DDT and other life saving chemicals. Surely it is unfair of Carson to imply that all insecticides are “agents of death” for animals other than insects (Carson 1962: 18).

Carson vividly describes the death of a bird that she thought may have been poisoned by a pesticide, but nowhere in the book does she describe the deaths of any of the people who were dying of malaria and other diseases transmitted by insects. Her propaganda in *Silent Spring* contributed greatly to the banning of insecticides that were capable of preventing human death. Carson and her book share the responsibility for literally millions of deaths among the poor people in the developing and undeveloped nations.

According to an entomologist in Tzaneen (Tsakane Furumele), DDT is the most significant discovery of all times, and “in malaria control alone it saved millions of South African lives”.

Environmental movements and Carson have clearly demonstrated their dislike of human lives endangered by mosquitoes. Yes, these insects have inherent value, but this does not translate to them biting humans and leaving them decapacitated. Humans have the right to defend themselves, when their survival is threatened. Killing of mosquitoes and some wildlife (by mistake) does not translate to human hate of nature. Humans have legitimate interests, and they are also teleological centres of life.

Other control measures which we proposed as a solution to fight the scourge of malaria are inadequate, impossible and impractical. The debate, man versus nature will not be easily won. It depends on how rich you are, and how politically powerful

you are. As long as you are coming from the South, your well being and health will always be relegated to nothingness.

The attitude of some Western environmentalists to put nature above the concern for people is regrettable. Banning DDT will surely guarantee the loss of human lives in poor countries.

DDT must therefore not be phased out immediately, although I agree that one day it must, after the world collaborated in finding an alternative cheap, reliable chemical as effective as DDT in targetting malaria vectors. The bottom line is that politics must not endanger the health of the poor.

Therefore it will be foolhardy if the use of DDT is simply restricted or abandoned, unless its known detrimental health effects are greater than the effects of uncontrolled malaria on human health.

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