THE IMPACT OF THE WAR MACHINE ON GLOBAL WARMING AND
HEALTH: A POLITICAL ECOLOGICAL PERSPECTIVE

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Introduction

Various forces, such as the production of commodities for a growing world population clamouring for both basic and prestige resources, the increasing proliferation of motor vehicles, an expanding number of airplane flights worldwide, the overheating and overcooling of commercial operations, deforestation, animal production for food, and industrial agriculture are often cited as the sources of global warming. War and, more broadly the war machine as defined in this volume, are not usually included on this list. In this chapter, as the simple scheme illustrated below indicates (see figure 1), in addition to its other direct effects on human health and well-being, I argue that the war machine generates a considerable level of greenhouse gas emission which, in turn, contributes to global warming and resulting impacts upon health. At the same time, global warming contributes to armed conflict, creating a vicious cycle for the planet and its inhabitants.

[Figure 1, about here]

War and the Motor Vehicle-Oil-Complex
In their monumental book, *Monopoly Capital* (1966), Paul Baran and Paul Sweezy identified the steam engine, the railroad, and the automobile as having had ‘epoch-making’ impacts on capitalist development in their respective eras of technological dominance. They argued that the petroleum industry in large part has been a creation of the automobile. While states and empires have long engaged in ‘resource wars,’ as Michael Klare (2001) so aptly observes, the discovery of oil in the late nineteenth century added a new dimension to warfare. According to Kolko,

The destructive potential of weaponry has increased exponentially, and many more people and nations have access to it. . . The world has reached the most dangerous point in recent, or perhaps all of, history. There are threats of war and instability unlike anything that prevailed when a Soviet-led bloc existed. Since the beginning of the twentieth century, oil has played a significant part in both world and regional wars (Kolko 2006:177).

Moreover, as McQuaig (2004:3) usefully observes: “Even as the competition over dwindling reserves heats up and threatens to cause international conflict, we are faced with a still more devastating consequence of our addiction to oil – global warming.”

While war contributes to global warming vis-à-vis greenhouse emission, as indicated in Figure 1, the converse is also true. One of the consequences of global warming is increased dispute and armed conflict. This pattern, already can be seen in sub-Saharan Africa in the increase in warfare in drought-stricken regions, with each conflict threatening to become a global issue involving even larger-scale fighting as the ever worsening 21st century effects of global warming unfold. Bearing in mind the integral connections between fossil fuel powered motor vehicles, oil, and war, one may pinpoint the motor vehicle-oil-military complex as the principal engine of
production within the capitalist world-economy and hence a central component of the war machine.

As Figure 2 illustrates, the unrelenting capitalist drive for profits, as it is played out somewhat differently within individual nations (e.g., the U.S., England, Japan, Germany, Russia, and China) leads to a ever expanding need to extract oil from the natural environment in order to provide fuel for motor vehicles, including military ones, and other forms of transportation, including those used for military purposes. Motor vehicles, of course, impact human health as a result of accidents, but, in addition, they impact human health because the by-products of fossil fuel combustion are various highly toxic environmental pollutants (e.g., carbon monoxide, benzene, nitric oxide) and CO₂, a greenhouse gas.

Global warming and other environmental degradations pose serious problems not only for human settlement and subsistence patterns, but also for human health in the form of increased heat stress and exhaustion, flooding, and infectious diseases that have spread due to the warming of environments at greater distances from the equator and at higher elevations. The systemic drive for ever increasing profit pushes for expanded power to ensure the ability to gain control of energy and other resources, which drives up the war machine’s need for fuel, and consequent environmental damage, which, in turn, creates new conflict over dwindling useable resources. Eventually, resource wars erupt in various regions, thereby creating scenarios in which the carbon-based military machine pollutes the environment, causes global warming, creates diseases and other health problems, and kills and maims people. The end result is an ever more impactful--in terms of fiscal, human, and ecological costs--upward spiral of adverse interactions between the war machine, the environment, and human health.
Oil for Military Operations and Wars

Although the discovery of oil preceded the advent of the automobile era by about five years, the rise of the petroleum and the automobile industries were intricately interwoven. Oil was the principal source of economic growth during most of the 20th century and continues to be so in the 21st century (Heinberg 2006:1). It is estimated that nearly half of worldwide oil consumption is devoted to the global auto and aircraft industries. While most motor vehicles and airplanes are used by civilians, a notable number of them, however, are owned by the military and are used in military operations and actual wars.

Militaries with their heavy reliance on airplanes (ranging from jet fighters to planes carrying troops and cargo to Air Force One), battleships, aircraft carriers, tanks, and other military equipment rely heavily on oil. Indeed, the Post Carbon Institute (2007) reports that the Pentagon is the single largest consumer of oil in the world, with an official figure of 320,000 barrels of oil per day being used for vehicle transport and facility maintenance. The official figure does not include “energy for the manufacture of vehicles, energy for building and dismantling of military facilities, energy for construction of roads, and energy consumed while rebuilding whatever the military blows up” (Fitz 2007:1). Klare (2008:11) maintains that the Pentagon consumed 134 million barrels of oil in 2005, as much as the entire country of Sweden. In his most recent book, he reports that “[d]uring World War II, the American military consumed one gallon of petroleum per soldier per day; during the first Gulf War of 1990-91, the rate rose to four gallons per soldier per day; in the Bush administration’s
wars in Iraq and Afghanistan, it leapt to sixteen gallons per soldier per day.”

One-third or more of U.S. military oil consumption reportedly occurs outside
of the United States (Smith 1990-1991:1). Two decades ago, Smith reported:

The biggest gas-hogs in the Pentagon’s arsenal are the Navy’s non-nuclear
aircraft carriers that burn 134 barrels per hour and battleships which consume
68 barrels per hour. At a speed of 25 knots, the USS Independence (a 1070-
foot-long aircraft carrier with . . . a flight deck and a crew of 2300) consumes
150,000 gallons of fuel a day (Smith 1990-1991)

Consumption levels have continued to go up with the constant development of new,
more powerful, war vehicles. An armoured division of 348 tanks requires nearly a
half billion gallons of fuel a day. A B-52 bomber requires 86 barrels per hour and F-4
Phantom fighter/bombers consume 25 gallons of fuel per minute. Ironically, the U.S.
Army is redesigning the Humvee, a battlefield vehicle that has been modified for the
civilian market, because it consumes as little as four miles per gallon in city traffic
and only eight miles per gallon on the open road (Peak-Oil News and Message Boards
2009). More so than all the other countries in the world, as none other than George
W. Bush noted in his State of the Union address on January 31, 2006, “America is
addicted to oil.” Klare (2003:16) adds that oil is “absolutely essential to US national
security, in that it powers the vast array of tanks, planes, helicopters, and ships that
constitute the backbone of the American war machine.”

Gwynne Dyer (2008), an international affairs journalist, posits diminishing
natural resources, massive population shifts, ‘natural disasters,’ spreading epidemics,
droughts in some regions, rising sea levels, declining agricultural productivity,
economic crises, and political upheaval as some of the possible consequences of
global warming and associated climatic changes that may come to drive international
conflicts as the twentieth-first century unfolds. His futuristic book projects potential security crises in the United States in 2029, Northern India in 2036, and China in 2042. It is evident in various studies and committees commissioned by the Pentagon (Walsh 2009) that there is growing awareness within the war machine that global warming is likely to be a primary source of many future wars.

**Hot and Cold Wars for Oil**

Oil has long been a factor in international power initiatives and conflict. The Japanese attack on Pearl Harbor on December 7, 1941, for example, was in part prompted by the American decision to cut off oil exports to Japan earlier that year (Heinberg 2006). Prior to this event, Japan had relied very heavily on imported oil from the United States and invaded the Dutch East Indies in part to access its rich oil fields.

Since the Second World War, Western powers have employed military might in ensuring access to oil. In his discussion of *petro-imperialism*, Altvater (2006:51) argues that “oil security” constitutes one of the priorities of the United States and other powerful oil-consuming countries and blocs, such as the European Union. He delineates three strategies that these countries and blocs have utilized in their efforts to gain strategic control over oil: “Diplomacy, and the establishment of friendly interstate relations, as in the Gulf region; or by means of subversion, as in some Latin American and African countries; or by using massive military power, such as in Iraq, and to a lesser extent also in Central America – and perhaps in the future against Iran and Venezuela (Altavater 2006:51). The 1953 coup in Iran orchestrated by the United States and UK resulting in the overthrow of Prime Minister Mossadegh was in large part prompted by his call to nationalize his country’s oil fields (Wheelwright 1991).
During the Cold War, Baran and Sweezy (1966:183) argue, the United States employed its military and economic power to “attract large segments of old colonial empires into its own neo-colonial empire.” In its assertion that it constituted the principal bulwark against the spread of communism, the U.S. in the wake of World War: 1) provided economic support to various capitalist powers, particularly the UK, West Germany, and Japan; 2) created an elaborate system of military alliances and bases around the massive perimeter of the Soviet bloc and elsewhere; and 3) developed a massive military force that essentially functioned as a form of state capitalism under the guise of what Eisenhower aptly termed the ‘military-industrial complex’, of which the motor vehicle-military complex constitutes a major component (Baran and Sweezy 1966:191). In contrast, while the Soviet Union developed its own military-industrial complex, its stance toward foreign relations was largely defensive, including using its military muscle to create a subordinated buffer zone between itself and the West by establishing and maintaining satellites in Eastern Europe.

The rich oil reserves of the Persian Gulf region have long served as locus of the resource wars. Following colonial and neo-colonial interventions in the area by Britain, Russia, France, and Germany, the United States has established itself the major world power in the region. According to Klare 2004:x), “By the end of the twentieth century, safeguarding the flow of oil from the Persian Gulf had become one of the most important functions of the U.S. military establishment.”

Indeed, tensions in the Middle East generally constitute the single most significant factor affecting the price of oil over the course of the past three decades or so. As the editors of Monthly Review reported a few months before the U.S. invasion of Iraq in 2003,
Military, political, and economic aspects are intertwined in all stages of imperialism, as well as capitalism in general. However, oil is the single most important strategic factor governing U.S. ambitions in the Middle East (Editors 2002:000).

Middle Eastern governments, such as Saudi Arabia, Iran, and Iraq, have used their oil earnings to purchase more weapons and have assisted arms manufacturers in capitalist developed societies to earn tremendous profits. What Bichler and Nitzan (2004:310) term the “Weapondollar-Petrodollar Coalition” requires an “atmosphere of permanent threat,” a role played for the U.S. by the Soviet Union during the Cold War. At the same time, while the United States has acted in an increasingly imperialist manner in the Middle East, the war in Iraq has split the countries of the European Union in various ways and has revealed internal tensions within the core countries of the capitalist world system, (Boswell 2004).

Many countries, both in the developed and developing worlds, have a strategic interest in securing access to petroleum and other energy supplies. The United States far more than any other country, however, has employed its military for this purpose. According to Dancs, Orisich, and Smith (2008:35),

Without including costs of war, we estimate that approximately $100 billion out of the military budget is spent to fulfil the mission of securing access to energy in fiscal year 2009. If we include three-fourths of the spending on the Iraq War, the figure doubles. Without war, securing energy access accounts for about 20 percent of the Department of Defense budget. With the majority of the Iraq War spending included, the proportion rises to nearly one-third of the budget.
Darfur in southern Sudan and other parts of sub-Saharan Africa constitute the loci for a new Cold War, one focusing on competition for oil between Western powers and China. Increasingly China requires massive amounts of this commodity in order to support its monumental economic growth (Englahl 2007). China now extracts an estimated 30 percent of the oil it needs from Africa with about eight percent coming from southern Sudan alone. The China National Petroleum Corporation (CNPC) owns 40 percent of the Greater Nile Petroleum Operating Company, with the Sudanese National Energy Company owning 60 percent of the consortium (Mitchell 2007:31). CNPC constructed a pipeline from its concession blocs 1, 2, and 4 in the southern Sudan to a new terminal at Port Sudan in the Red Sea and holds concession rights to bloc 6 which straddles Darfur, near the borders with Chad and the Central African Republic. The Sudan was China’s fourth largest foreign oil source in 2006.

Elsewhere in sub-Saharan Africa, the United States now obtains more than 15 percent of its oil from various West African countries, almost as much as it acquires from Saudi Arabia. According to Mitchell,

The USA has been assiduously courting the oil-producers Angola, Nigeria, Chad, and Equatorial Guinea, all of which are run by regimes which are despotic to varying degrees. What is the likely outcome for the people of these oil-producing countries of the new USA’s new interest in the continent? Trouble, of one kin or another, seems to be the answer. In Angola, for example, oil revenues have enabled the government of Jose Eduardo dos Santos to build a massive army and secret police force (Mitchell 2007:32).

While U.S. oil companies were signing contracts with Gabon, Nigeria, Equatorial Guinea, Angola, and Algeria, the Bush administration increased aid to and stationed
military advisors in various African countries (Turshen 2004:2). Furthermore, in their
efforts to grab oil,

The leading energy-consuming nations have tried to protect access to vital
materials by providing arms and military training to the arms forces of
their primary suppliers, thereby encouraging the rulers of these countries
to rely on brute force rather than compromise and inclusion when dealing
with any group that seeks a greater share of oil or mineral revenues. More
often than not, this guarantees an endless succession of coups at the top and
revolts, ethnic upheavals, and gang wars below (Klare 2008:176).

Indeed, one reading of the initiation by the Bush Administration of the $50 billion
President’s Emergency Plan for AIDS Relief (PEPFAR), most of which goes to 21
African nations, is that it is part of an effort to court relations and goodwill in Africa
in light of the growing importance of African oil to the U.S. economy.

Another cold war of sorts has developed between the United States and various
South American countries, particularly Venezuela, over the past several years. As part
of his anti-imperialist policies, Venezuelan President and populist Hugo Chavis has
used the oil income of his country’s nationalized oil industry to finance ambitious
social programs, especially in education and health care. He also has agreed to
provide Cuba with 53,000 barrels of oil a day (Jones 2007:288). In turn, financially-
strapped Cuba is allowed to pay with a combination of money, goods, and services.
This arrangement is estimated to be worth $550 million a year and is intended to
provide Cuba with one third of its needed oil supply. Additionally, Venezuela has
struck an agreement to sell China oil and will obtain 18 ships from China in return
(Jones 2007:443). Under Chavez’s presidency, Venezuela has encouraged its
hemispheric neighbours to create regional oil consortia for the Caribbean
(Petrocaribe), the Andean region (Petroandino), South America (Petrosur), and Latin America (Petroamerica). Chavez also assisted Argentina in paying its debt to the International Monetary Fund, assisted Bolivia in paying off some of its debts, and “pledged $1 billion in credit assistance to Ecuador” (Rothkoff 2008:186). He has visited numerous countries, including Russia, China, Belarus, Iran, Indonesia, Vietnam, Malaysia, Portugal, Qatar, Syria, Mali, Benin, and Angola, and there is little doubt that oil was a key item of discussion with other heads of state. While undoubtedly Chavis’s extensive exercises in foreign diplomacy have cut into monies that could be spent for domestic programs, he has quickly evolved into a major player among a network of countries that are seeking in a variety of ways to challenge U.S. economic and military hegemony. Thus, the Bush administration sought as much as possible to undermine his influence both on the global scene and within his own country by backing ventures to depose him (Lebowitz 2006:95). In contrast, President Barrack Obama, as was manifested in his cordial demeanour toward Chavez at the 5th Summit of the Americas in Port du Spain, Trinidad, in April 2009 and promise of re-establishing diplomatic ties with Venezuela has adopted a ‘doctrine of engagement’ toward the populist if demagogic president who has expressed approval of socialist values.

**Oil and War as Generators of Greenhouse Gas Emissions**

McQuaig (2004:3) succinctly captures the linkage between the demand for oil and the environmental consequences of its use, arguing that we are “in a strangely paradoxical situation: there’s not enough oil to meet the world’s growing consumption, but that growing consumption is itself threatening to ruin the world.” Caught now between “the frying pan and the fire, we seem to be squeezed into a
space without a lot of wiggle space” (McQuaig 2004:3). The exact level of contribution of military operations to global warming remains an under-researched topic. While Biswas (2000) in his scientific assessment of the long-term consequences of specific wars on the environment discusses impacts on land, water, and air quality, as well as on noise pollution, resource depletion, and the generation of hazardous wastes, he downplays the impact of war on global warming. In commenting upon greenhouse gas emissions resulting from the First Gulf War, he observes that “carbon dioxide emissions from the war are now estimated at 300 million metric tons, only about 1.5 percent of the current global emissions from the burning of fossil fuels and biomass” and “the impact on global warming is likely to be so small that immeasurable because the extent, intensity, and duration of the fires were not significant on a global scale” (Biswas 2000:313). In fact, however, it appears that Biswas grossly understates the contribution of war to global warming. The Pentagon’s activities in 1988, for example, reportedly resulted in about 46 million tons or 3.5 percent of U.S. CO₂ emissions that year (Renner 1997:121). According to Renner, Estimating a global figure for carbon emissions from the military is fraught with uncertainty. A back-of-the-envelope calculation for the late 1980s yields an estimate of about 150 million tons: almost three percent of the global total, or nearly equal to the annual carbon emissions of the United Kingdom. If the energy consumption of arms-producing industries were included, these numbers could well double (Renner 1997:121).

More recent figures indicate that CO₂ emissions came to 60 million tons from U.S. military operations in 2005 and 5 million tons from UK military operations in the same year (Parkinson 2007:4). In 2005, in its Emissions of Greenhouse Gases Report, the Energy Information Administration indicates that the U.S. produced 6,023 million
metric tons of CO$_2$. In that a metric ton equals 2,204.6 pounds, this means that the U.S. produced 6630 million tons of CO$_2$ in 2005, about 1% of which was produced by military activities. However this figure only refers to actual military operations. Fixed military installations significantly increase this amount. For example, in Alaska, which is expect to be especially had hit by the effects of global warming there are 241 power plants emitting CO$_2$. Two of these, the Eielson Air Force Base plant and the Fort Wainwright Central Heating and Power Plant, rank among the “dirtiest” energy production facilities in the United States based on their the total carbon emissions per megawatt of electricity produced (O’Hara 2007). These two military facilities produce about 6,000 pounds of CO$_2$ per megawatt of electricity, or more than five times the CO$_2$ emission level per megawatt of energy produced by the gas turbine plant at Beluga, Alaska, the state’s largest electrical producer.

While it remains difficult to determine the precise level of greenhouse gas emissions during actual fighting, according to Martinot (2007:2), in 2004 the U.S. Army alone “burned 40 million gallons of fuel in three weeks of combat in Iraq, or almost 2 million gallons per day, an amount equivalent to the gasoline consumed by all Allied armies combined during the four years of World War I.” During the first Gulf War, Iraq allowed over 600 oil wells to burn for a period of time, thus emitting an undetermined amount of CO$_2$ into the atmosphere among other substances that impact human health. According to one source, “[a]n estimated three to six million barrels of oil per day were burnt (compared with an average daily consumption of oil in all Western Europe of 12 million barrels)” (Castels 2004:214).

**The Impact of Global Warming on Security**
Numerous reports have been issued by the Pentagon or other entities that express growing concern about the impact of global warming on U.S. national security. In one of the earliest of these documents, Homer-Dixon (1990) delineated the following clusters of environmental problems that potentially contribute to armed conflict: *greenhousing warming* (his term and my emphasis), ozone depletion, deforestation, acid rain, land degradation, over-utilization of water supplies; and fish stock depletion. More recently, in its recognition that global warming or climate change may pose a ‘security threat’ to the United States, the Pentagon commissioned the CNA Corporation (2007), a non-profit national security organization, to write a report on this issue. CNA convened a panel of retired military officers and national security experts as part of its effort to assess the security implications of global warming. In its report, CNA (2007:6) asserts that global warming “acts as a threat multiplier for instability in some of the most volatile regions of the world” and “will serious exacerbate already marginal living standards in many Asian, African, and Middle Eastern nations, causing widespread political instability and the likelihood of failed states.” CNA stresses that global warming poses the possibility of even a greater number of people attempting to emigrate, either legally or illegally, from Mexico to the U.S. and a more turbulent seas that could adversely affect U.S. naval operations in the North Atlantic.

Peter Schwartz and Doug Randall (2003:1) authored another Pentagon-commissioned report titled “An Abrupt Climate Change Scenario and its Implications for United States National Security,” in which they lay out worse case scenarios that while not likely are “plausible” and thus would “challenge United States security in ways that should be considered immediately.” Flowing from drastic climatic changes, Schwartz and Randall forsee the possibility of food shortages caused by diminished
“net global agricultural production,” “decreased availability and quality of fresh water in key regions,” and “disrupted access to energy supplies due to extensive sea ice and storminess.”

More recently the German Advisory Council on Global Change released a report for the German Advisory Council on Global Change (2007:1) in which they state:

Climate change will draw ever-deeper lines of division and conflict in international relations, triggering numerous conflicts between and within countries over distribution of resources, especially water and land, over management of migration, or over compensation payments between countries mainly responsible for climate change and those countries most affected by its more destructive effects.

Dan Smith and Janana Vivekanda (2007:3), two policy analysts associated with International Alert, an international organization that focuses on building peace and security in countries that have endured armed conflict, authored a report which asserts that many of world’s poorest countries and communities face a ‘double-headed’ dilemma: global warming and the potential for violent conflict. Like others, they maintain that global warming “could compound propensity for violent conflict, which in turn will leave communities poorer, less resilient and less able to cope with consequences of climate change” (Smith and Vivekanda 2007:46). Smith and Vivekanda further argue that the 46 countries where the “effects of global warming interacting with economic, social and political problems could create a high risk of violent conflict” are home to some 2.7 billion people and that the 56 countries “where governments will have great difficulty taking strain of climate change climate change on top of all their other current challenges” are the home to some 1.2 billion people.”
Indeed, a growing number of analysts have referred to the conflict in Darfur as the first climate war. For Faris (2009:16), “Darfur may be a canary in the coal mine, a foretaste of climatically driven political chaos.”

In another effort to assess the impact of climate change on security, Kurt Campbell and colleagues (2007) gathered a group of U.S. nationally recognized experts in climate science, foreign policy, political science, oceanography, history and national security, under the auspices of the Center for Strategic and International Studies and the Center for a New American Security. This team, recognizing that there remain many uncertainties about the pace global warming is occurring, examined the effects of three different possible climate change scenarios. The first, the expected scenario, which would entail an average global temperature increase of 1.3°C by 2040, predicts “heightened internal and cross-border tensions caused by large-scale migrations; conflict sparked by resource scarcity, particularly in the weak and failing states in Africa; increased disease proliferation. . .; and some geopolitical reordering as nations adjust to shifts in resources and prevalence of disease” (Campbell et al. 2007:6). The second, the severe scenario, which assumes an average global temperature increase of 2.6°C by 2040, predicts the likelihood of “armed conflict between nations over resources, such as the Nile and its tributaries” and the possibility of nuclear war (Campbell et al. 2007:7). Finally, the last alternative, the catastrophic scenario, which would involve an average global temperature increase of 5.6°C by 2100, predicts the possibility of the rapid decline of the global economy and the collapse of alliance systems and multilateral institutions, such as the UN and the Security Council; and a substantial reduction of “U.S. military’s worldwide reach” due to the “demand of missions near [U.S.] shores” resulting from “migration toward U.S. borders by millions of hungry and thirsty southern neighbors” (Campbell et al.
Given the ever faster pace at which climate scientists have tracked global warming processes and changes, the potential for a worst case scenario has been building in recent years.

In that global warming will contribute to a shortage of water in some areas as well as adverse affects on agriculture production in much of the world, conflicts over basic resources may well emerge in various regions as global warming progresses. McGuire (2008:130) posits the possibility of water wars erupting in places such east Africa, where Uganda has been draining water from Lake Victoria, and between Bangladesh and India given that India plans to “divert up to one third of the flow of Brahmaputra, Ganges and other rivers to drought-prone waters in the south of the country.” Similar patterns are likely to develop at many other hotspots around the world as rising temperature shrinks or dries up potable water sources and diminishes agricultural production.

The Impact of Global Warming on Health

The contributions of the war machine to increases in global warming have clear and significant health implications for diverse populations. Various scholars have recognized the impact of global warming on health. In his now-classic Planetary Overload, Tony McMichael (1993), an epidemiologist at the Australian National University, discussed the direct effects of global warming on health in the form of heat stress and respiratory ailments, and the indirect effects in terms of the spread of vector-borne and water-borne diseases. More frequent heat waves, particularly in urban areas, threaten the health and lives of vulnerable populations, such as the elderly, the sick, and infants. The estimated mortality of some 35,000 people during the heat wave of summer 2003 in Europe, particularly France and Spain, was
associated not only from the high temperatures but also the fact that the night-time low temperatures have been rising nearly twice as fast as daytime temperatures. The lingering night-time warmth deprived people of normal relief from blistering daytime temperatures and the opportunity to recuperate from heat stress. Air pollution linked to longer, warmer summers particularly affects those suffering from respiratory ailments, such as asthma. Temperature increases also contribute to an increase of ozone in the atmosphere. According to Epstein and Rogers,

Heat waves take a disproportionate toll on those living in poor housing lacking air conditioning, and those with inadequate social supports. The majority of those affected during the 1995 heat wave in Chicago, for example, were African-Americans living in substandard housing (Epstein and Rogers 2004:6).

Notably, global warming appears to be the primary impetus behind the spread of infectious disease north and south of the Equator and to higher elevations. While global warming is not the only factor involved--globalism and the rapid flow of people, commodities, and pathogens in conjunction with increased technological and economic developments are also critical--it is a primary force contributing to the capacity for spread of various diseases, as seen in the increasing rise of malaria in sub-Saharan Africa. In that malaria is worsened by inadequate diet, global warming may have a doubling impact on the health burden of malaria in Africa in coming years. Global warming appears also to have contributed to the resurgence of various other epidemics, including cholera in Latin America in 1991, pneumonia plague in India in 1994, and the outbreak of the hantavirus epidemic in the U.S. Southwest in 1994. In this regard, McMichael presents the following observations:

The main anticipated impact of climate change on the potential transmission
of vector-borne diseases would be in tropical areas. In general, populations on the margins of endemic areas in the tropical and subtropical countries would be most likely to experience an increase in transmission. . . This appears to reflect a combination of increasing population mobility, urbanization, poverty and regional warming, along with a slackening of mosquito control programmes. Meanwhile, in temperate zones, climate change may also affect diseases such as tick-borne encephalitis (which occurs in parts of Western Europe, Russia, and Scandinavia) and Lyme disease (McMichael 2001:302).

As a result of these factors, it is appropriate to speak of the diseases of global warming (Baer and Singer 2009). This includes any ‘tropical disease’ that spreads to new places and peoples, but also includes failing nutrition and fresh water supplies because of desertification of pastoral areas or flooding of agricultural areas and other diseases too, such as heat stroke). The UN Food and Agriculture Organization has warned that in some 40 percent of the poorest developing societies with some two billion people, global warming may drastically increase the numbers of malnourished peoples. In this, it is evident that the war machine plays an important part in reshaping the environment in ways that enhance both global warming and the array of diseases and health problems associated with it, consequences that expand the steep human toll of armed conflict specially and the war machine generally.

### Conclusion

As I have demonstrated in this chapter, the oil-motor vehicle-military complex as an integral component of the capitalist world-system, is an important contributor to global warming. While the contribution of fossil fuels, including oil but also coal and natural gas, and the heavy global reliance on motor vehicles and other modes of fossil
fuel-based transportation to global warming, has received considerable attention, the specific role of the war machine in our growing environment and health crisis has not. In this chapter, I have attempted to begin the process of unraveling the complex dynamic involving the petroleum and motor vehicle industries and the war machine as well as the impact of the oil-motor vehicle-military complex on global warming, and ultimately on health. As Singer and I argue in Global Warming and the Political Ecology of Health (Baer and Singer 2009), mitigation of global warming will require transcending global capitalism and replacing it with an alternative global economic system committed to meeting the basic social needs of all peoples and achieving social parity, democratic processes, and environmental sustainability, one that Singer, Susser, and I have termed democratic eco-socialism (Baer, Singer, and Susser 2003).

No doubt, global capitalism is a well-entrenched system with support from many sides. Still the impact of global warming and other ecocrises ultimately may destabilize capitalist institutions internationally. Sociologist John Urry, for example, cautions that a dystopian world may be produced by the on-going and ever-increasing effects of global warming. He argues that as global and national governance systems deteriorate, local warlords will control access to water, oil, and gas. Notes Urry (2008:348), “with extensive flooding, extreme weather events, and the break-up of long distance oil and gas pipelines, these resources [will] become exceptionally contested and protected by armed gangs” (Urry 2008:348).

In order to ward off such calamitous scenarios, various voices are challenging global capitalism from many quarters, including the global justice or anti-corporate globalization, environmental, labor, indigenous and ethnic rights, and peace movements, as well as socialists, anarchists, and even left liberals and social democrats. Indeed, a distinct climate justice or anti-global warming movement has
emerged over the past few years, one that has built upon warnings about the dangers of global warming emanating over the past two decades from climate scientists, environmental groups, and indigenous groups in the Arctic and South Pacific. This movement remains very disparate and is presently struggling to develop meaningful strategies that will effectively challenge global capitalism and its political allies in governments around the world. Opposition to the motor vehicle-oil-military complex in one form or other is particularly embodied in the environmental, pro-public transportation and cycling, and peace movements, although organizations within these movements often tend to adopt a single issue perspective. To date, most analyses of global warming have not factored in the contribution that the war machine makes to this phenomenon. It is evident, however, that any proposal for mitigating global warming needs to come to terms with the role of the war machine, in all of its varied expressions and component, to both global warming and health problems. As Martinot (2007) argues, as a result, the environmentalist, anti-consumption, alternative energy will have to be “anti-militarist” in that the military plays a key role in the making of global warming.
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Figure 1

The Impact of the War Machine on Global Warming and Health

War Machine \rightarrow \text{Greenhouse gases} \rightarrow \text{Global warming} \rightarrow \text{Health impacts}
**Figure 2**

**Model of Impact of the Oil-Motor Vehicle-Military Complex and War on Global Warming and Health**

<table>
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<th>Capitalism</th>
<th>Oil as a Vital Energy Resource</th>
<th>Military Machine &amp; Wars for Oil</th>
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<th>Motor Vehicles and Other Transport</th>
<th>Pollution &amp; Greenhouse Gas Emissions</th>
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<td>Forms as Sources of Profit</td>
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**Global Warming & Related Climatic Changes**

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<th>Conflicts Resulting from Global Warming</th>
<th>Injuries, Disease, &amp; Death</th>
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