CONTEMPORARY WARS AND THE ENVIRONMENT

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War is an on-going activity in human affairs. Since the end of World War II, this activity has, to put it somewhat cynically, been "business-as-usual". A new war started up somewhere at a rate of one every three months and around 140 wars occurred, all told, between 1945 and 1980. Around 80 countries, chiefly in the Third World, have been involved in these wars, in which over thirty million people have died (as against 50 million in World War II).

While man has perhaps always been an aggressive animal (judging from archaeological and even fossil evidence), the armaments and military preparations in the modern world are truly monstrous in scale and refinement.

The human suffering and the economic consequences arising out of conflicts are reasonably well appreciated. However, what in often insufficiently appreciated are the effects (including disruption of eco-systems) of military preparations and activities on the environment.

The Gulf War of 1991, for instance, had a variety of environmental effects which included threats to the wildlife of the area. (The wildlife of the area included the Arabian oryx, dolphins, dugong, green turtles and the sometimes over six-foot-long Tigris salmon in addition to less widely known fauna and flora). The noise alone of well over 25 thousand sorties of military aircraft would have had an impact on wildlife in addition to that, for instance, of the deposition of oil from the wells which were set on fire. The devastation caused by the bombing would have included the release into the environment of toxic PCBs (polychlorinated biphenyls) from damaged transformers and CFC_s (Chloroflurocarbons) from damaged refrigeration systems. Other environmental problems of the Gulf War which may be referred to include the impacts of 1) over one million armed military personnel stationed in the desert, 2) spills of over eleven million barrels of oil, 3) the destruction of two operational nuclear reactors, 4) the breakdown of sewage treatment and garbage disposal in Baghdad and 5) warfare in an archaeologically- rich area.

While a somewhat different spectrum of environmental effects is occurring due to the on-going conflict in the former Yugoslavia (e.g. the felling of trees to provide fuel), it is instructive at this point to present a more general overview of some aspects of modern military preparations and technologies.

Resource Utilization

A few facts regarding utilisation of resources for war and war-related activities will help to indicate the extent of the cause for concern.

One indication of the exceedingly high level of wastage of resources incurred for war-related purposes is given by considering military expenditures. Global military expenditures around 1981 were variously estimated as being about 400 to 550 thousand million US dollars per year (which is around one million US dollars per minute). According to trends prevailing in 1981, and after taking inflation into account, it was estimated that global military expenditure could reach one million million US dollars a year by the year 2000. Around 1981, probably 20 to 30,000 million US dollars an year worth of arms were traded internationally, while the total expenditure on weapons was about 135,000 million US dollars.

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As regards manpower, personnel occupied in war or war-related work are said to number 60 million. This includes 400,000 scientists or about 40 per cent of all living scientists.

The land used worldwide for military purposes is difficult to estimate. According to one criterion, the land usage per man in the armed services may range from approximately 0.3 to more than 5 hectares. Computations of global land usage for military purposes range from 42 to 174 million hectares.

Deterioration of land may, also, occur, e.g. due to the passage of heavy military vehicles and the explosion of bombs etc. A 250 kg-bomb may, on explosion, produce a scar of about 8 metres diameter and 4 metres depth. About one to ten per cent may remain unexplored, thus constituting a future hazard, whether on the battle field or the practice range. One state has noted that it had cleared nearly 14,500,000 landmines after World War II and that the work was still continuing at that time.

Trees may often be physically removed in wartime due different reasons. Damage including war-related fire damage) to forests in France during World War II amounted to around 500,000 hectares. Again, the approximately 200 immense tractors ("Rome ploughs") used by the U.S. forces in South Vietnam resulted in the removal of the trees of around 325,000 hectares of forest. Trees damaged by shrapnel are, also, liable to decay due to fungal attack. The loss of tree cover leads to soil erosion.

The military utilisation of raw materials, such as that of silver for photographic needs, is considerable. The total military utilisation of oil may be double that of the African continent.

Modern Warfare

There are several different techniques of warfare and each of them has adverse environmental effects of one kind or another.

Of the available options, the public is fairly familiar with the effects of conventional warfare. The scale of destruction due to modern warfare may, however, be gauged by noting that, over around ten years, the U.S. used approximately 14 million tonnes of bombs and other explosives in South Vietnam and that about 100,000 hectares of previously mainly forest land became covered with craters. (The citing of figures relating to the U.S. forces may sometimes mean that figures relating to other belligerents were unavailable for public information).

Chemical warfare agents are of different types. Anti-personnel agents (those used against people) include those used in World War I, such as arsenic compounds and mustard gas (which burns the skin and could blind). Modern anti-personnel chemical warfare agents include sensory irritants, incapacitants, blister gases, blood gases, nerve gases and lethal toxins. Sensory irritants include the "tear gas" or "CS gas" used by the police for mob dispersal. The toxin called botulin is estimated to be lethal at a dose of 0.013 milligram per man. (1000 milligram = 1 gram).

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Uses of anti-plant chemical agents include 1) destruction of crops which provide food to sustain the enemy and 2) defoliation of forests which provide concealment. These chemicals are also toxic to soil micro-organisms.

The 90,000 tons of anti-plant agents used in South Vietnam, over ten years, included the chemicals 2,4-D, 2,4,5-T, dimethyl arsenic acid and picloram. The chemical, dioxin, is a contaminant of 2,4,5-T and may cause human birth defects as well as cancer of the liver.

Some of the biological anti-personnel agents which have been examined are the pathogens responsible for brucellosis, tularemia, Q fever, Yellow fever, Venezuelan equine encephalitis and anthrax. Anthrax is an agent which may contaminate the area (for example, a target city) and leave it uninhabitable for well over a decade. A variety of methods have been examined for dispersal of pathogens, including sprays, bullets, missile warheads and cluster bombs.

Biological anti-crop agents which have been studied, include those against rice, potato, tomato, tobacco, sweet potato, soya beetroot and cotton. Methods of distribution of biological agents cold include the use of migrating birds (particularly useful for undermining an adversary against whom war has not yet been declared).

Environmental modification or geophysical techniques of waging war is another military possibility. Artificial rainmaking was tried in Indo-China in an attempt to disrupt roads and communications.

Nuclear Conflict

Nuclear war may well be the ultimate environmental horror and irrespective of where a nuclear war may take place the fall-out and climatic effects resulting from a major conflict could be expected to be global in extent.

Some of possible effects of a nuclear war have been discussed in many publications and conferences. For instance, it has been recorded that many of the over quarter of a million people who died in Hiroshima and Nagasaki in August 1945 were simply vaporised. The envisaged medium and long-term effects of a nuclear war suggest that the lucky ones would be those who die in the initial explosion of the bombs. Many others would die soon due to radiation and due to radiation sickness. The breakdown of society would result in hospitals, medicines etc. not being available to treat the sick and injured. Disease epidemics would break out following the breakdown of sanitation and gabage disposal services. Fresh-water reservoirs would be contaminated with radioactivity of several years and rain would be radioactive. It is possible clouds of smoke, dust etc. would block out the sunlight and warmth from large areas of the earth's surface resulting in what has been termed a nuclear winter". Food production by agriculture and fisheries would be badly affected as would food distribution. People would develop cancers and (or) become sterile and countless others would, for several decades, be born with genetic defects.

The above are a few of the hypothesized consequences of a nuclear war. The number of nuclear weapons in the world today probably exceeds fifty thousand which are together equivalent in destructive power to approximately one and a quarter million times the bombs used in Hiroshima. One B-52 bomber can transport more explosive power than that used in all of mankind's previous wars and battles put together.

Public Opinion and Treaties

It should be noted that military activity or fear of military activity lead to large-scale human migrations, which themselves create stresses, particularly on the receiving environment.

Treaties relating to the limitation of arms and their use are, however negotiated as one line of defence against the unleashing of modern techniques of warfare. Their success often depends on the public support they receive. (This paper is based on articles published in the "Sunday Observer in 1985 and 1991).