

# Environmental Destruction in the 1991 Gulf War\*

by Adam Roberts

Since the 1991 war between Iraq and the coalition powers there has been much interest in the question of how to limit the environmental damage of warfare. In addressing that question, it is necessary to look at the events of the war itself, and to draw some conclusions from that experience as well as from other experience and from more normative approaches.

That there would be a high risk of environmental destruction in any war over Kuwait had been expected beforehand — not least because, in September 1990, Iraq had threatened destruction of oilfields. Thereafter, for better or for worse, many of those warning of environmental destruction described the probable damage in apocalyptic terms, and used it as an argument against resorting to war at all.

In the months between the occupation of Kuwait in August 1990 and the outbreak of war in January 1991 there was rather less public debate about the need to observe laws of war restraints, including those in regard to the environment, if war should break out. The UN Security Council did not address laws of war issues systematically in its resolutions in this period. However, the ICRC, in its representations to governments in mid-December 1990, did refer to protection of the natural environment. Then, in the letter handed to the Iraqi foreign minister in Geneva on 9 January 1991, President Bush warned that the US would not tolerate “the use of chemical or biological weapons, support for any kind of terrorist actions, or the destruction of Kuwait’s oil fields and installations”.

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## Statements by coalition leaders

After the start of Operation “Desert Storm” on the night of 16-17 January 1991, statements by coalition governments placed some, albeit limited, emphasis on laws of war issues: but these were mostly of a rather general character, and contained few specific references to the protection of the environment or the avoidance of wanton destruction.

The address by President Bush on the evening of 16 January specified that targets which US forces were attacking were military in character, but contained no other indication of the limits applicable to the belligerents under the laws of war. In general, his speeches before and during the war contained little reference to the laws of war.

In remarks on 16-18 January, Richard Cheney, US Secretary of Defense, and Lt.-Gen. Chuck Horner, Commander of the US Central Command air forces, particularly stressed that the bombing campaign would avoid civilian objects and religious centres. Some of their words on this point echoed the words of Additional Protocol I of 1977, Article 48, which spells out the principle that belligerents must direct their operations only against military objectives.

During the war, the US armed forces appear to have placed much emphasis on operating within established legal limits. General Colin Powell said subsequently: “Decisions were impacted by legal considerations at every level. Lawyers proved invaluable in the decision-making process”.<sup>1</sup>

There appear to have been some official American attempts to limit discussion of the environmental effects of the war. On 25 January 1991 researchers at Lawrence Livermore National Laboratory received a memorandum which reads in part:

“DOE [Department of Energy] Headquarters Public Affairs has requested that all DOE facilities and contractors immediately discontinue any further discussion of war-related research and issues with the media until further notice. The extent of what we are authorized to say about environmental impacts of fires/oil spills in the Middle East follows:

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<sup>1</sup> Steven Keeva, “Lawyers in the War Room”, *ABA Journal*, American Bar Association, Chicago, Ill., vol. 77, December 1991, p. 52. See also the passage on “Role of Legal Advisers” in *Conduct of the Persian Gulf War: Final Report to Congress*, Washington DC, Department of Defense, April 1992, pp. 0-3 and 0-4.

Most independent studies and experts suggest that the catastrophic predictions in some recent news reports are exaggerated. We are currently reviewing the matter, but these predictions remain speculative and do not warrant any further comment at this time”.<sup>2</sup>

The British Government, at the start of “Desert Storm”, stressed that the coalition forces were operating within a framework of legal and moral restraint. Prime Minister John Major told the House of Commons on 17 January:

“I also confirm that the instructions that have been given to all the allied pilots are to minimize civilian casualties wherever that is possible, and the targets that they have been instructed to attack are, without exception, military targets or targets of strategic importance”.

He also said that the government had made clear to Iraq that it expected any captured British troops to be treated as prisoners of war according to international convention, adding that there had been “no positive response” from Iraq. At the beginning of the war there do not appear to have been any British government statements of a general character about the laws of war as they bear on the environment.

## **Iraqi actions on oil**

Soon after the beginning of “Desert Storm”, the Iraqi forces launched an artillery attack against the Khafji oil storage depot in northern Saudi Arabia, setting it on fire. It began to leak oil into the Gulf on about 22-23 January, causing the first major oil slick of the war. However, this was probably as much a military target as the oil depots and refineries in Iraq which were hit by the coalition bombing.

A much larger slick was caused by pumping huge quantities of oil into the Gulf from the Sea Island Terminal, a pumping station for the Mina al-Ahmadi crude oil tank farm in Kuwait. This apparently began on about 19 January. The spill was reportedly reduced by co-

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<sup>2</sup> Text published in *Scientific American*, New York, vol. 264, no. 5, May 1991, p. 9. A DOE spokesperson is quoted as saying that the policy was not intended to “muzzle the debate”, but because discussions of the possible effects of fires and oil spills could “give the Iraqis ideas”.

alition forces accidentally setting the terminal ablaze on the night of 25-26 January, and then brought under control by coalition bombing of the pumping stations at Mina al-Ahmadi on 26 January. There were also huge spills into the Gulf from five Iraqi tankers moored at Mina al-Ahmadi: by 24 January these ships were apparently empty, or almost empty, of oil.

The total amount of oil spilled into the Gulf almost certainly constituted the largest oil spill ever. It was much bigger than the *Exxon Valdez* disaster in Prince William Sound, Alaska, in March 1989, of around 250,000 barrels; and also bigger than the less well-known but larger oil rig accident in the Gulf of Mexico in 1979, of over 3,750,000 barrels. Estimates at the time of the total amount of oil spilled into the Gulf ranged up to eleven million or more barrels of crude. The true size of the spill was probably between seven and nine million barrels.<sup>3</sup>

The total damage done by the slicks, while less than many had feared, was considerable. By May, over 400 kilometres of the Saudi coast, as well as the southern Kuwaiti coast, was affected. There was damage to coastal marshlands, to wildlife (over 15,000 birds killed), to coastal flora, to fishing, and to offshore oil operations.<sup>4</sup>

The most dramatic Iraqi environmental crime, the destruction of the oilfields of Kuwait, was unprecedented in scale. It had been carefully prepared. Some oil installations in Kuwait were set on fire by the Iraqis during the first week of the war. Then on about 21 February, just before the coalition ground offensive began on 23-24 February, Iraq started the programme of systematic destruction of oil installations, casting a huge pall of smoke across the country. Before Iraqi forces fled from Kuwait one week later, they blew up or damaged virtually all the oil installations. Over 500 wells were set on fire, wasting between 2 and 6 million barrels per day.<sup>5</sup>

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<sup>3</sup> Pentagon, *Final Report to Congress*, p. 0-26. In the same month, a Greenpeace paper by William M. Arkin, "Gulf War Damage to the Natural Environment", pp. 2-3, gave the same figure, but mentioned additionally that smaller quantities of oil continued to leak into the Gulf from a number of sources until May or early June 1991.

<sup>4</sup> A short survey of ecological damage is *The Environmental Legacy of the Gulf War*, Amsterdam, Greenpeace, 1992.

<sup>5</sup> Kuwait Environment Protection Council, *State of the Environment Report: A Case Study of Iraqi Regime Crimes Against the Environment*, Kuwait, November 1991, pp. 1, 2-3, and Table in Fig. 2. This states that after 26 February, 613 wells were on fire, 76 gushing, and 99 damaged. It quotes the Ministry of Oil in Kuwait as stating that 6 million barrels of oil per day, and 100 million cubic metres of gas a day, were being lost. Greenpeace, *The Environmental Legacy of the Gulf War*, pp. 17 and 38, gives figures of between 2.3 and 6 million barrels per day.

These Iraqi actions seem to have had little military rationale. Kuwait later claimed that the environmental devastation was not the result of military conflict, but “the product of a deliberate act that was planned in the very first days of the brutal Iraqi occupation of Kuwait”.<sup>6</sup> It is possible that the oil slicks in the Gulf were intended to hamper possible efforts at amphibious landings in Kuwait: however, quite apart from the doubtfully relevant fact that (as emerged later) the coalition’s preparations for such landings were a ruse, it is debatable whether slicks created by the odd terminal disgorging oil would have seriously hampered any amphibious landings. The coalition powers managed by various means to avoid oil damage to their ships.<sup>7</sup> As to the burning of the oil wells, in some cases the creation of huge smoke clouds may have been intended to hamper coalition air operations, especially reconnaissance and ground attack. However, smoke palls could achieve little since Iraq’s defence plan was essentially static and predictable, and since the palls quickly lofted to levels high enough to allow aircraft to operate underneath. There are conflicting views as to whether the smoke had a slight military effect or none.<sup>8</sup>

What was the purpose of Iraq’s releasing of oil and destroying oilfields? It was probably less tactical than punitive and destructive: to show that a country losing a war can still do damage, hurt its adversaries and neighbours, and diminish the value of the prize for which the war is being fought. The fact that only Kuwaiti wells were set alight, and not those on the Iraqi side of the border, confirms this, as does the fact that explosive charges were used, rather than simple ignition with opened valves.

The Iraqi environmental destruction was heavily criticized by coalition leaders. Thus on 25 January, as the extent of the Iraqi oil spill into the Gulf was attracting notice, President Bush said at a news conference:

“Saddam Hussein continues to amaze the world. First, he uses these Scud missiles that have no military value whatsoever. Then, he uses the lives of prisoners of war, parading them and threat-

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<sup>6</sup> Letter from Permanent Mission of Kuwait at UN to the UN Secretary-General, 12 July 1991; text in Glen Plant (ed.), *Environmental Protection and the Law of War*, London, Belhaven Press, 1992, p. 265.

<sup>7</sup> Confirmed by the Pentagon in *Conduct of the Persian Gulf Conflict: An Interim Report to Congress*, Washington DC, Department of Defense, July 1991, pp. 13-1 and 13-2; and in the 1992 *Final Report to Congress*, p. 0-27.

<sup>8</sup> Compare the Pentagon’s *Interim Report to Congress*, p. 13-2 (which says the smoke did have some effect) with the *Final Report to Congress*, p. 0-27 (which says it had little).

ening to use them as shields; obviously, they have been brutalized. And now he resorts to enormous environmental damage in terms of letting loose a lot of oil — no military advantage to him whatsoever in this. It is not going to help him at all... I mean, he clearly is outraging the world”.

In late January and February, the British Minister for the Environment similarly condemned Iraqi actions as “unleashing this environmental catastrophe”, and “a violation of international law”. On the environmental impact of operations by the forces seeking to implement UN resolutions, he said: “Environmental factors are taken into account by the coalition forces as far as possible in the planning and conduct of military operations as part of the policy of ensuring that collateral damage from those operations is minimized”.<sup>9</sup>

On 22 February, as the Iraqis began destroying the Kuwaiti oil installations, and on the eve of the coalition land offensive, President Bush said: “He is wantonly setting fire to and destroying the oil wells, the oil tanks, the export terminals, and other installations of that small country”.

The effects of the destruction of the oil installations in Kuwait proved to be serious, though mainly confined to the region. The rate of burn-off was actually higher than many had anticipated. The flood of oil from the wells formed lakes and reportedly affected aquifers. The fires involved huge waste of a valuable natural resource, and spewed many gases, including the “greenhouse” gas carbon dioxide (perhaps 3 per cent of the world’s total annual fossil fuel emissions), into the atmosphere. In Kuwait in the months after the war, there was heavy atmospheric pollution, causing an increase in respiratory illnesses, a lowering of regional temperatures, and much damage to the land.<sup>10</sup> The smoke was widely reported as having adverse effects in neighbouring countries, including Iran. There were reports of black rain in Turkey, Iran and the Himalayas. However, soot from the fires does not appear to have risen high enough to cause the global environmental effects which some had feared.<sup>11</sup>

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<sup>9</sup> *Hansard*, London, vol. 184, col. 655, 28 January 1991; vol. 186, cols. 285-6, 22 February 1991.

<sup>10</sup> See e.g. Greenpeace, *Environmental Legacy of the Gulf War*, pp. 17-22 and 34.

<sup>11</sup> John Horgan, “Up in Flames”, *Scientific American*, vol. 264, no. 5, May 1991, pp. 7-9; Neville Brown, “The Blazing Oilwells of Kuwait”, *The World Today*, London, vol. 47, no. 6, June 1991; D. W. Johnson *et al.*, “Airborne Observations of the Physical and Chemical Characteristics of the Kuwait Oil Smoke Plume”, *Nature*, London, vol. 353, no. 6345, 17 October 1991, esp. at p. 621.

The Iraqi actions — the discharge of oil into the Gulf, and the burning of the Kuwaiti oilfields — were plainly contrary to the laws of war. There has been general agreement that they violated Article 23 (g) of the Hague Regulations of 1907. It is also widely accepted that they violated Article 147 of the Fourth Geneva Convention of 1949, and also Article 53, which is in the section on occupied territories. Whether the Iraqi actions would have constituted violations of two conventions in this field which mention the environment — the 1977 ENMOD Convention, and the 1977 Additional Protocol I — neither of which was formally in force in the Gulf war, is a more contentious matter.

As regards ENMOD, a key question is: was Iraq, to use the language of Article II, “changing — through the deliberate manipulation of natural processes — the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere”? It might well be asserted that this was, rather, a case of the deliberate abuse of man-made installations and artificial processes: of damage *to* the environment, but not necessarily damage *by* the forces of the environment. The terms of ENMOD, as well as the fact that it was not in force in this war, suggest that it has limited relevance to the Iraqi actions.<sup>12</sup>

As regards Articles 35 and 55 of the 1977 Protocol I, there is perhaps more room for the view that Iraqi actions would have violated these environmental provisions. In its July 1991 interim report to Congress, the Pentagon stated that Iraq had committed extensive and premeditated war crimes, which included “unnecessary destruction, as evidenced by the release of oil into the Persian Gulf and the sabotage of hundreds of Kuwaiti oil wells”. It stated that these actions “could implicate a number of customary and conventional international law principles”, including the 1907 Hague Regulations and the Fourth Geneva Convention of 1949, and further mentioned in its list Articles 35 and 55 of the 1977 Additional Protocol I.<sup>13</sup> However, the Pentagon’s April 1992 final report, while continuing to assert the illegality of Iraqi actions, was much more dismissive of the Protocol’s relevance, especially in the following:

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<sup>12</sup> This is the clear conclusion of the Pentagon’s *Interim Report to Congress*, p. 12-6; and *Final Report to Congress*, pp. 0-26 and 0-27.

<sup>13</sup> *Interim Report to Congress*, pp. 12-5 and 12-6.

“Even had Protocol I been in force, there were questions as to whether the Iraqi actions would have violated its environmental provisions. During that treaty’s negotiation, there was general agreement that one of its criteria for determining whether a violation had taken place (‘long term’) was measured in decades. It is not clear the damage Iraq caused, while severe in the layman’s sense of the term, would meet the technical-legal use of that term in Protocol I”.<sup>14</sup>

This passage is likely to provoke criticism. Yet the fact that there is scope for debate about the relevance of the environmental provisions of Protocol I (and also of ENMOD) suggests the importance of other provisions, including those of the 1907 Hague Regulations and the Fourth Geneva Convention of 1949: these were a key basis for judging the actions of the belligerents.

## **Coalition military actions**

Many coalition actions in the crisis had environmental consequences, even if they were on a lesser scale than those caused by their adversaries. Of all the actions which were taken by the coalition, that which has attracted most attention as regards environmental consequences is the bombing of Iraq. Many objects which were attacked, such as oil storage sites, power stations and factories, provided for the needs of both the armed forces and the civilian population. It must be doubtful whether it is possible to embark on a policy of damaging the military function of such targets without at the same time doing harm to the civilian population and/or the environment; and so it proved in this case. In March 1991, in the immediate aftermath of the war, a controversial report submitted to the United Nations noted the destruction of non-military objects in Iraq: for example, seed warehouses, and a plant producing veterinary vaccines; and it said that “all electrically operated installations have ceased to function”, causing shortages and contamination of the water supply.<sup>15</sup> The damage to facilities serving Iraqi civilian life was also criticized in a report by Middle East

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<sup>14</sup> *Final Report to Congress*, p. 0-27.

<sup>15</sup> Report of the UN Secretary-General to the President of the Security Council, New York, 20 March 1991 (S/22366), prepared by Under-Secretary-General Martti Ahtisaari.



Watch.<sup>16</sup> Some other reports in the aftermath of the war were less negative.<sup>17</sup>

Coalition attacks on nuclear facilities in Iraq inevitably raised worries that there might be substantial release of radioactive materials. In the event, any such release appears to have been minor. The question remains, which will no doubt be faced in future conflicts, whether attacks on such facilities are contrary to the laws of war. There is no absolute answer. The problem comes closest to being addressed in the 1977 Additional Protocol I, Article 56, on “Works and installations containing dangerous forces”. However, this is of limited relevance, mainly because it deals with “nuclear electrical generating stations”, but does not appear to address the types of nuclear installations actually attacked in Iraq. Even if the targets had been nuclear electrical generating stations, attack is only prohibited (and then incompletely) “if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population”. If attack does take place, “all practical precautions shall be taken to avoid the release of the dangerous forces”. These formulae leave much to the judgement and skill of the attackers. Clearly attacks on nuclear installations, such as occurred in the 1991 Gulf war, risk very serious consequences, and require very special reasons and precautions: but it cannot be said that they are always prohibited.

A strong defence of the coalition bombing policy generally can be made along the lines that it was aimed at targets which had some military relevance, was conducted with unusual precision, and any damage which was outside the proper military purposes of the war was accidental or collateral in character. These points were emphasized by Tom King MP, Secretary of State for Defence, in evidence to the Defence Committee of the House of Commons on 6 March 1991. He stated categorically that water pumping plants in Baghdad had not been a target, though their operations had inevitably suffered from the attacks on electrical power-generating stations; and he said that nuclear reactors were only attacked “after the most detailed planning to minimize the risk of any radiation spreading outside the site”.<sup>18</sup> The

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<sup>16</sup> *Needless Deaths in the Gulf War: Civilian Casualties During the Air Campaign and Violations of the Laws of War*, Middle East Watch/Human Rights Watch, New York, 1991, 402 pp.

<sup>17</sup> See for example the report by Paul Lewis, “Effects of War Begin to Fade in Iraq”, *New York Times*, 12 May 1991, p. 2E.

<sup>18</sup> House of Commons, Defence Committee, Tenth Report, *Preliminary Lessons of Operation Granby*, HMSO, London, July 1991, pp. 10-11.

account of the war in the British defence white paper makes the same point:

“There was evidence too that Iraq had been seeking to develop nuclear and biological weapons. The allies therefore placed great importance on deterring Iraq from using any such weapons. Alliance leaders made it clear they would take the gravest view of any Iraqi use of weapons of mass destruction. Production and development facilities were attacked with precision-guided munitions using tactics designed to minimize any risk of contamination outside the sites”.<sup>19</sup>

Similarly, the Pentagon’s reports to the US Congress in July 1991 and April 1992 say of the bombing campaign that aircraft and munitions were carefully selected to achieve “the least risk to civilian objects and the civilian population”.<sup>20</sup>

Taking the coalition bombing campaign overall, and making full allowance for the inadequate state of current information about its effects, it does appear that such coalition actions as damaged the environment were less wanton and gratuitous than the Iraqi oil crimes in Kuwait, and that some, but only some, significant efforts were made to avoid or reduce certain kinds of environmental damage. However, the bombing campaign is an uncomfortable reminder that prohibiting or reducing the environmental damage of war is not a simple task. Oscar Schachter’s judgement is worth noting: “The enormous devastation that did result from the massive aerial attacks suggests that the legal standards of distinction and proportionality did not have much practical effect”.<sup>21</sup>

The coalition did avoid some actions which would have affected the environment. In the months before the war, when UN Security Council sanctions were imposed on Iraq, there were some proposals that Iraq might be defeated by stopping the flow of the Tigris and Euphrates (both of which originate in Turkey): these proposals were not implemented, for reasons which can be guessed but are not definitely known.

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<sup>19</sup> *Statement on the Defence Estimates, 1991*, vol. 1, HMSO, London, July 1991, p. 17.

<sup>20</sup> Department of Defense, *Interim Report to Congress*, p. 12-3; and *Final Report to Congress*, p. 0-10.

<sup>21</sup> Oscar Schachter, “United Nations Law in the Gulf Conflict”, *American Journal of International Law*, Washington DC, vol. 85, no. 3, July 1991, p. 466.

## **Remnants of war**

The dangerous effects of remnants of war have long been a cause of concern, including to the United Nations. Such acts as the laying of mines without keeping careful plans violate basic principles of the laws of war on several grounds. They pose an obvious risk to innocent human life, even after the end of a war, and they may degrade the environment in a lasting way. Moreover, attempts to make the land environment safe again are liable to cost a great deal of money, human effort and lives.

The 1991 Gulf war left the land littered with the remnants of war. There were pools of oil near the destroyed oil installations and on the frontier with Saudi Arabia, where they had been prepared by Iraqi forces to frustrate a coalition invasion. Iraqi forces reportedly laid well over 500,000 mines in Kuwait and abandoned quantities of unexploded ordnance. As to the coalition, as many as one third of its bombs and projectiles reportedly failed to detonate, the soft sand and the use of stockpiled or experimental weapons increasing the failure rate; and many US anti-personnel mines, dropped into the battle area, remained a lethal hazard afterwards. In less than a year after the war, explosive ordnance reportedly killed or wounded some 1,250 civilians and claimed fifty lives among demolition specialists.<sup>22</sup> Substantial quantities of depleted uranium, which is toxic and mildly radioactive, were left in armour-piercing shells in the desert.

Some less-publicized aspects of environmental damage were potentially serious. According to some accounts, the movements of armoured vehicles over the desert landscape of Saudi Arabia, Kuwait and Iraq in the months of crisis and war left the desert surface looser than before, and may have increased the likelihood of severe sandstorms.

## **Action to protect the environment during and after the war**

During and after the war the tackling of major environmental hazards in the whole area of the conflict involved difficult problems

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<sup>22</sup> Tony Horwitz, report from Kuwait, *The Wall Street Journal Europe*, Brussels, 21 January 1992.

of diagnosis, prescription, organization and international co-operation. Not all were handled equally effectively.

There was much action to limit the effects of the oil spills in the Gulf. The US government took some effective steps on an inter-agency basis. A huge containment and recovery effort was made by Saudi Arabia's Meteorology and Environmental Protection Administration, and by the International Maritime Organization. Under the auspices of the UN Environment Programme and the Kuwait Regional Convention on Protection of the Marine Environment 1978 a special oil clean-up ship, the *Ali-Wasit*, recovered 500,000 barrels of oil from the Gulf. Altogether some two million barrels of oil were recovered. A serious threat to the world's largest desalination plant, at al-Jubayl in Saudi Arabia, was effectively countered by booms, nets and skimmers — the one part of the protection and clean-up effort that seems to have been completely successful. The efforts concentrated on protecting industrial and desalination plants, and not environmentally sensitive areas. There is much dispute over methods of tackling this and similar disasters.<sup>23</sup> Overall, while there remains a thick tarry layer in the sands of the Saudi coast, the waters and wildlife of the Gulf have made an impressive recovery, confirming to some observers the remarkable capacity of nature to survive disasters.

As to the oil fires in Kuwait, there was debate about the adequacy of preparations during the war, by either the US government or the Kuwaiti government in exile, to prepare for putting them out. After a slow start, work on controlling the oil fires gathered pace: the last fire was extinguished on 6 November 1991. There were inevitably missed opportunities, and many lessons to be learned from this episode so far as future oil fire disasters are concerned. In 1992 there was criticism of the Kuwaiti authorities for further damaging the wells by rushing to bring them back on stream before they had time to recover.<sup>24</sup> Numerous other aspects of the clean-up operations posed problems. In Kuwait, huge quantities of oil remained on the surface even after the fires were put out.

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<sup>23</sup> On the methods of coping with the oil spills in the Gulf, see especially William M. Arkin *et al.*, "On Impact: Modern Warfare and the Environment — A Case Study of the Gulf War", Washington DC, May 1991, pp. 63-6; John Horgan, "The Muddled Cleanup in the Persian Gulf", *Scientific American*, vol. 265, no. 4, October 1991, pp. 86-8; and Marguerite Holloway, "Soiled Shores", same issue, pp. 81-94.

<sup>24</sup> See e.g. Maria Kielmas, "Kuwait Plunders Oilfields to Destruction", *The Independent*, London, 22 May 1992.

## UN Security Council post-war resolutions

After the war, the UN Security Council held Iraq responsible for the damage caused by the invasion and occupation of Kuwait. Resolution 686 of 2 March 1991 demanded that Iraq “accept in principle its liability under international law for any loss, damage, or injury arising in regard to Kuwait and third States, and their nationals and corporations, as a result of the invasion and illegal occupation of Kuwait by Iraq”. It also required Iraq to “provide all information and assistance in identifying Iraqi mines, booby traps and other explosives as well as any chemical and biological weapons and material in Kuwait...”.

Resolution 687 of 3 April 1991 — the longest ever passed by the Security Council — contained many provisions relevant to the environment. It reaffirmed that Iraq “is liable under international law for any direct loss, damage, including environmental damage and the depletion of natural resources, or injury to foreign governments, nationals and corporations, as a result of Iraq’s unlawful invasion and occupation of Kuwait”. Further, stringent measures of disarmament — especially in the chemical, biological, missile and nuclear fields — were imposed on Iraq by that and subsequent resolutions.

Despite these UN resolutions, after the cease-fire almost nothing was heard from the coalition governments on the subject of the major war crimes, and the personal responsibility of Saddam Hussein and colleagues for them. An opportunity to spell out the criminal nature of certain Iraqi actions, including wanton damage to the environment, was missed. The Security Council’s failure after the war to address the question of war crimes was all the more striking in view of the explicit reference to such crimes in resolution 674 of 29 October 1990.

The reasons why the war crimes issue was not pursued are serious and need to be understood. Three stand out. First, there was wide agreement in the months before January 1991 that if there was to be a war for the liberation of Kuwait, it had to be a limited war for limited objectives: neither the occupation of Iraq nor the capture of its leadership would have made sense in this context. Second, there was nervousness in coalition capitals about going ahead if opinion in countries in the region did not support trials. And third, in many coalition capitals there was the hope, publicly expressed from the beginning of the war, that some internal political change within Iraq would solve the problem for them.

However, as a minimum it would have been possible for an authoritative statement to be made, to the effect that major war crimes had occurred, involving *inter alia* grave breaches of the Geneva

Conventions, that there was personal responsibility for these crimes, and that under the Geneva Convention any State is entitled to prosecute. Such a statement could have been made by the coalition powers, the UN General Assembly, or the Security Council.

## General issues and conclusions

One war is too narrow a frame of reference for making hard and fast observations on the multi-faceted subject of the impact of war on the environment.<sup>25</sup> Environmentalists and lawyers may, like generals, be open to the accusation of always fighting the last war. Vietnam produced very different environmental problems, and so will present and future wars. Both in peace and war, environmental damage can take many forms, can be very hard to forecast beforehand and to assess afterwards, is open to very different interpretations and is hard to rectify. However, the events of the 1991 Gulf war do suggest a number of conclusions, which may be briefly summarized as follows:

1. Prophecies of total global ecological disaster appear in this case to have been exaggerated. The most serious ecological consequences of the war were local, mainly in Kuwait but also in Iraq and in other States which border on the Gulf. While the consequences of the oil crimes were extremely serious, the aspect of environmental damage which cost the most in human lives was probably the scattering of hundreds of thousands of mines and other remnants of war in land areas.
2. The use of environmental considerations may in certain circumstances be ineffective as a reason against resorting to war at all. This is not only because some prophecies of doom may not be believed, but also because ecological factors may be counterbalanced by other powerful considerations (e.g. prevention of aggression, maintenance of credibility of international institutions) or interests. The *jus in bello* aspects of environmental protection therefore need to be taken seriously.
3. While the coalition powers affirmed that they did take environmental considerations into account in many aspects of their actions,

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<sup>25</sup> A point made admirably by Antoine Bouvier, "Protection of the Natural Environment in Time of Armed Conflict", *IRRC*, No. 285, November-December 1991, p. 570.

many problems remained. Attacks on such military targets as electric generating stations had serious effects on water and sewage systems, leading to disease and loss of life. Attacks on nuclear installations, however skilfully they were conducted, inevitably involved some risk of contamination.

4. There was never much doubt in the international community that acts such as wholesale releases of oil into the Gulf or destruction of the Kuwaiti oilfields were illegal. However, the legal grounds for asserting this illegality were not always clearly enunciated. There was too much tendency to rely on legal provisions which specifically mention the word “environment” (including Articles 35 and 55 of Additional Protocol I of 1977) — provisions which were of limited applicability and relevance in this case. Other general principles and detailed provisions of the laws of war, including those of the 1907 Hague Regulations and the 1949 Geneva Conventions, were indisputably in force and clearly covered these acts of wanton destruction.

5. The various environmentally destructive acts in this war were caused not by new or advanced weaponry but by selecting as targets sensitive installations. Also, many of these acts were not so much acts of combat as wanton destruction of property in occupied territory. They thus represent new manifestations of problems traditionally tackled by the laws of war — problems which are likely to get more serious as societies develop.

6. A key question raised by the environmental destruction in this war (as also by the Iraqi use of hostages) is not that of developing new law, but rather of how to secure understanding and implementation of existing law. In particular, how is the international community to respond before, during, and after a war, when one belligerent apparently rejects basic provisions of the laws of war and/or appears unconcerned about environmental issues?

7. During a war, preventing an adversary from committing environmentally destructive acts, even where they have little or no military value, can be a particularly complex task. It can easily appear that the coalition did not make serious enough efforts in this direction: for example, of the many leaflets dropped by the coalition powers on Iraqi forces, none discouraged environmental destruction. Perhaps a main reason for this is that the coalition was deeply preoccupied with dissuading Iraq from other actions — such as use of gas and chemical weapons — which were also illegal, and which posed a much more immediate threat to the lives of coalition troops.

8. This war, especially the spills in the Gulf, raised two questions which may need consideration even if the answers may not be simple. First, to what extent do peacetime environmental rules (such as the Kuwait Regional Convention on the Protection of the Marine Environment 1978) continue to be applicable in a war? And can wartime clean-up efforts (which may involve specialists of many types) have any protection comparable, say, to that accorded in various treaties to humanitarian relief efforts?

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