Environmental Damages from Minefields

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Environmental Damages from Minefields

Desert Storm brought Iraqi Forces to Kuwait and, with them, mines. Aerial diagrams illustrate the areas of Kuwait still littered with landmines. Landmines are causing significant short- and long-term damage to the environment, resulting in soil erosion, destruction of vegetation and topsoil and negatively impacting wildlife.

by Dr. Raafat Misak and Dr. S. Omar [Kuwait Institute for Scientific Research]

In the aftermath of the deployment of the Iraqi Forces on Kuwait in early August 1990, they started taking their defensive garrisons, preparing for fortifications and laying mine belts. The Iraqi Forces, while occupying Kuwait, depended upon mines to establish an integrated system of barriers and impede the advance of any force attempting to liberate Kuwait. Dr. Raafat Misak and Dr. S. Omar of the Kuwait Institute for Scientific Research report the following:

Landmines had been cleared from Kuwait by companies and governments. For mine-clearance and 21 kilometers.

The second was behind the first, extending to the north of the front belt in the depth of Kuwaiti 1991, showing two major mine belts left behind for a distance that ranged between three and four kilometers. The first mine belt was advanced in the front, extending to the north of 10 to 15 kilometers to the northern border with Saudi Arabia. This strategic defense line spanned from the Arabian Gulf coast in the east to Wadi Al Burin in the west, a distance of about 175 kilometers. The width of this line ranged between one-and-a-half and two kilometers and was composed of anti-personnel and anti-tank minefields, open trenches and emplacements that controlled the minefields.

Aerial photos and satellite images of Kuwait taken in 1991 and 1992, and the map of dangerous areas prepared by the Ministry of Defense and Kuwait municipalities in 1991, show including 10 to 15 kilometers to the northern border with Saudi Arabia. The first mine belt was advanced in the front, extending to the north of the front belt in the depth of Kuwaiti 1991, showing two major mine belts left behind for a distance that ranged between three and four kilometers. The first mine belt was advanced in the front, extending to the north of 10 to 15 kilometers to the northern border with Saudi Arabia. This strategic defense line spanned from the Arabian Gulf coast in the east to Wadi Al Burin in the west, a distance of about 175 kilometers. The width of this line ranged between one-and-a-half and two kilometers and was composed of anti-personnel and anti-tank minefields, open trenches and emplacements that controlled the minefields.

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By late February 1991, the liberation of Kuwait was nearing completion and the Ministry of Defense signaled contracts for mine clearance with several companies. For mine clearance purposes the country was subdivided into eight sectors (see Figure). The teams destroyed 95.7 percent of AP mines and 91.4 percent of AT mines in the field. The remainder were stored.

Active mine-clearance and demining programs (March 1991–July 1993). During this phase, the following activities took place:

- Storing usable mines (about 5 percent of total cleared mines)
- Destroying damaged mines (about 95 percent of total cleared mines)

As a result of these three events, various environmental damages affected the environment. Additionally, the destruction of the immense number of mines caused soil pollution by residual explosives.

Environmental damages are classified as either “immediate” or “long-term.” Specific examples of “immediate” damage in Kuwait include:

- Soil pollution and contamination in its chemical properties due to explosive and destroying mines, whether in situ or in holes specially prepared for this purpose, at depths ranging between one and three meters.
- Soil disruption during mine exploitation, resulting in the drift of the fine, fertile soil particles, thus the soil productivity is weakened or completely depleted.
- Soil compaction due to turning heavy equipment. Consequently, the rate of water infiltration into soils is reduced between 18.46 percent and 96.8 percent in comparison to unaffected soils, according to “Soil Compaction and Sealing in Al Salim Area.” In this study, a soil compaction map was prepared for Al Salim area. It shows three different classes of soil compaction: highly compacted (68.8 percent of the soil), slightly compacted (47.7 percent), and almost non-compacted (89.5 percent). The highly compacted soils are detected in the areas affected by mine implantation. The bulk density for the compacted soil (mine-affected areas) is high (1.6–1.7 grams per cubic centimeter) compared to slightly compacted soils (1.2–1.35 grams per cubic centimeter).
- Destruction of the vegetation cover of grazing value, e.g., Haloxylon salicornica (located in the western areas of the country), Cyperus congestulatus (located in the southeastern areas of the country) and Ipypoges (located in Umni Omara on Salim Road and its surroundings) plant species.

Specific examples of “long-term” damage in Kuwait include:

- Soil creasing and sealing as a direct result of vegetation degradation.
- Hydrological disruption and loss of rain and runoff waters during the water seasons.
- Soil compaction and sealing in Al Salim area. In 1990, the United Nations Environmental Programme found that the most environmentally damaging of all the explosives used on land in the Gulf War were the anti-personnel bombs and tear-gas mines. The destruction of the vegetation cover resulted in breaking up the muddy soil, which is the most fertile soil type in Kuwait. In addition, soil crusts were developed on the top soils and compaction resulted in loss of water infiltration, which results in deterioration of the biological potential of soils. Besides these damages, the vegetation cover in the Kuwaiti desert was destroyed as a result of mine implantation and removal in a later stage.

Extent of Damage

This area contaminated with mines near the borders with Saudi Arabia (strategic minefields) extends from the Arabian Gulf coast in the east to...
Initial Iraq Landmine Impact Survey Completed

The first phase of a three-year survey on 13 of Iraq's 18 provinces has been completed. The Landmine Impact Survey is an important tool for the government of Iraq and international donors, allowing a temporary blueprint to be made for clearance of landmines, unexploded ordnance, abandoned munitions and other explosive remnants of war. Such hazards threaten one in every five Iraqis, according to the U.S. Department of State, whose Office of Weapons Removal and Abatement Funded the US$4 million survey.

The survey was conducted in the provinces of Babylon, Baqubah, Dahrak, Dhi-War, Erbil, Kirkuk, Missan, Muthanna, Najaf, Qadisiyah, Sulaymaniyah, Tameem and Wasit. Work will proceed in the remaining five provinces—Al-Anbar, Baghdad, Diwla, Nineveh and Salah ad-Din—as security conditions permit.

The survey will allow the government and international donors to improve the allocation of demining and clearance resources. It was completed, the State Department reports, by Iraqi citizens, including teachers and doctors, and was done via foot, car, tractor and even donkey. The survey was conducted in the provinces of Babylon, Basrah, Dahrak, Dhi-War, Erbil, Kirkuk, Missan, Muthanna, Najaf, Qadisiyah, Sulaymaniyah, Tameem and Wasit. Work will proceed in the remaining five provinces—Al-Anbar, Baghdad, Diwla, Nineveh and Salah ad-Din—as security conditions permit.

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