

# Long-term environmental damage due to NATO bombing in Yugoslavia

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The NATO bombing of Yugoslavia in 1999 breached international humanitarian law and caused long-term environmental damage, a report by the American based research group, Institute for Energy and Environmental Research (IEER), has found.

The IEER carried out a case study of two industrial facilities targeted by NATO in Operation Allied Force. The Pancevo industrial complex, consisting of a petrochemical and fertiliser plant as well as an oil refinery, is situated 20 kilometres (12 miles) from Belgrade. The Zastava car plant in Kragujevac is 100 kilometres (60 miles) south of Belgrade.

The Pancevo plant stands at the confluence of the River Tamis and the Danube while Zastava is located on the Lepenica River, a tributary of the Velika Morava, which in turn meets the Danube 60 kilometres downstream. After the bombings, toxic chemicals gushed into the waters of Europe's second largest river. Civilians living near the plants became vulnerable to major health risks from contamination of the atmosphere, food produced locally and the water supply.

The authors caution, "As modern warfare becomes more technologically sophisticated and targeting more precise, it is essential not to succumb to the idea that the damage on the ground is also precise and limited. It may be in some cases, but precise bombing does not always yield precise or limited damage. As this study indicates, the health and environmental consequences of precision bombing can affect unborn generations far into the future, even when the bombs are entirely successfully in finding their targets."

The IEER chose the two facilities as case studies because NATO had carefully selected them as targets. Pancevo and Kragujevac are two of four areas designated as environmental "hotspots" by the international body charged with overseeing the post-war cleanup operation, the United Nations Environmental Program Balkan Task Force (UNEP/BTF.) The report's pollution estimates are based largely upon surveys conducted by the UNEP/BTF in the immediate aftermath of Operation Allied Force. The majority of the pollutants dealt with in the report can be found in the Top Twenty Hazardous Substances listed by the Agency for Toxic Substances and Disease Registry (ATSDR).

Three people were killed directly by NATO bombing of the industrial complex when it was hit repeatedly during April 1999. The NIS Oil Refinery was the most heavily targeted and was bombed as late as June.

The report concentrates on the major contamination by mercury and 1,2-dichlorethane. Eight metric tonnes and 2,100 metric tonnes were released of the toxic chemicals respectively. The former is known to cause brain and digestive disorders and lead to birth defects, while the latter is classified as a probable human carcinogen and can attack the nervous system. Both are known to percolate rapidly into the groundwater when released into the soil, threatening the water supply. Until now only the mercury spill has received immediate attention, as this is highly volatile and the vapours pose an immediate threat. While large amounts of the contaminated soil have been removed, there is still a residual amount that has entered the groundwater.

The report warns about the lack of action to clear up the 1,2-dichlorethane spill. Fifty percent was released into the ground with the remainder in the plant's waste channel. The report explains, "The fact that the area of contamination has not really spread 1,2-dichlorethane on the surface indicates that any movement from a surface spill would be downward toward the [local] aquifer. As described earlier, once contamination has reached the aquifer, it spreads horizontally in the direction of the groundwater flow" (*Precision Bombing, Widespread Harm* by Sriram Gopal and Nicole Deller, Institute for Energy and Environmental Research, page.38).

The US Environmental Protection Agency's regulation for the concentration of 1,2-dichlorethane in drinking water is set at five micrograms per litre. The concentrations found in the groundwater around Pancevo exceeded that by several thousand times in some instances. This constitutes the main long-term threat in the area as the chemical has a half-life of 30 years.

Additional sources of toxic pollutants in the area are those released by fires caused by NATO bombing. At the petrochemical plant, 460 metric tonnes of vinyl chloride were incinerated whilst 62,000 metric tonnes of oil and oil related products were burnt at the oil refinery. The result was a release of hydrochloric acid fumes and nitrogen and sulphur compounds, which cause respiratory problems. The report states that the fires at the oil refinery probably released significant amounts of sulphur dioxide and nitrates, "These two compounds are associated with acid rain that results from industrial activities."

A reporter who visited the area noted, "The repeated air strikes on the industrial complex, which covers several acres, culminated in three huge hits at 1.00 a.m. on April 18. The bombs sent fireballs into the air and enveloped Pancevo in clouds of black smoke and milky white gasses. Flames leapt from the facilities for 10 days."

An estimated 1,500 tonnes of vinyl chloride, 3,000 times higher than permitted levels, burned into the air or poured into the soil and river, according to municipal officials in Pancevo. This has left the banks of the river edged with white foam that still clogs the canals around the town. Huge quantities of other noxious chemicals burned or gushed out of storage facilities, including an estimated 15,000 tonnes of ammonia, 800 tonnes of hydrochloric acid, 250 tonnes of liquid chlorine, vast quantities of dioxin (a component of Agent Orange and other defoliants) and 100 tonnes of mercury.

By the dawn of the night attack, dozens of people were hospitalised gasping for air, or were temporarily blinded or unable to digest food, witnesses said. At its peak, on the night of April 18, the number of people evacuated from the town and surrounding villages reached 80,000, approximately one-tenth of the population.

The Zastava car plant in Kragujevac, a town with a population of 150,000, was bombed twice, once on April 9 and again on April 12, 1999. It was hit with a dozen bombs. Before the imposition of sanctions, this was one of the largest industrial plants in the whole of the Balkans.

In an attempt to deter NATO air strikes, the workers and management at the plant issued an open letter three days after Operation Allied Force began explaining that they were forming a human shield around the site. NATO didn't alter its plans and 124 people were injured in the subsequent bombing.

In a further appeal the workers explained, "Tonight, the 9th of April, the Zastava factory plants in Kragujevac were bombed. The live shield was broken through. This bombardment has inflicted severe damage to the factory equipment and almost completely destroyed the energy supply complex that served not only the Zastava factory, but also the heating needs of the entire city of Kragujevac: its residential houses, schools, faculties, hospitals...." [*World Socialist Web Site*, April 13, 1999 Workers at Serb car plant bombed by NATO make appeal to world public]

The report concentrates on the dangers posed by the release of Polychlorinated Biphenyls (PCBs), a mix of 209 individual chlorinated compounds generally used as coolants and lubricants in transformers and other electrical equipment. Since 1977 their manufacture has been stopped in the US because they are known to pose a severe health risk. According to ATSDR, the discharge or accidental release of 1 pound or more of PCBs into the environment should be reported immediately to the Environmental Protection Agency. It is a probable human carcinogen and can cause endocrine disruption.

The power station, assembly line, paint shop and computer centre suffered either major damage or total destruction. Two transformers were hit and leaked PCBs into the surrounding area. From one transformer alone 1,400 litres of pyralene oil (transformer oil composed of PCBs and another highly toxic substance, trichlorobenzenes, otherwise known as "trike") leaked into the floor and waste pits. Workers involved in the initial clean up did not wear protective clothing and some were taken ill.

The transformer at the power station leaked unknown quantities of PCBs into the Lepenica River via the sewage system. The gravel basin underneath the transformer was unable to cope with the volume that was released and the concentrations of PCBs around the rainwater drain were higher than inside the plant. The operation to remove the contamination within the plant has largely been completed by UNEP/BTF, but the same cannot be said about the drainage system outside. Flooding during July 1999 may have spread pollutants in the waterways to nearby low-lying agricultural areas. Tests for PCB contamination have not been conducted on the water wells on the shores of the Morava River by either the city's public health institute or UNEP/BTF.

The issue of adequate funding raises the question of liability for the damages, something that NATO refuses to accept responsibility for. To make matters worse, other Balkan countries are making compensation claims against Serbia. The report cites the fact that Hungary has demanded that Serbia refund orders paid for in advance from the petrochemical plants destroyed during the bombing.

NATO maintained that its military offensive against Yugoslavia was justified on humanitarian grounds. However, the report questions the moral and legal authority of Operation Allied Force. NATO's military action did not comply with the Geneva Convention and the laws protecting the lives of non-combatants adopted in 1949 and the two Additional Protocols that became international law in 1978. Two years ago, Amnesty International (AI) found NATO responsible for perpetuating war crimes after demonstrating that it had violated these laws.

While the IEER estimate the number of civilians killed during Operation Allied Force at 500, Christopher Layne writing for the Cato Institute estimates that between 1,200 and 2,000 civilians were killed.

As Operation Allied Force progressed, an increasing array of weaponry was used including cluster bombs and missiles tipped with depleted uranium (DU). This was carried out under the auspices of downgrading Yugoslavia's military capability as the term "dual-use" was stretched to

efface any meaningful distinction between military and civilian installations. The report cites several cases where existing international law on discriminating between the former and the latter were ignored by NATO.

Apart from the oil refinery neither of the case studies in the report could qualify as playing a critical role militarily. The Zastava car plant was not involved in arms production at the time. Moreover, even where a military use can be proven this does not remove the need to ensure that civilian fatalities are avoided.

The report notes that Article 35 of Additional Protocol I prohibits the use of weaponry "of a nature to cause superfluous injury or unnecessary suffering" and "methods or means of warfare which are intended, or may be expected, to cause widespread, long term and severe damage to the natural environment."

Of the 19 NATO countries that took part in the bombings, 16 have ratified Additional Protocol I. Turkey has not, France did so only after the Operation Allied Force, while the US was signatory to the treaty but did not ratify it. However, it did ratify the 1977 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD). This came into effect after the Vietnam War and forbids the use of the environment or environmental modification as a means of warfare. The bombings of installations storing such large quantities of toxic substances amounted to a form of chemical warfare.

NATO's greatest crime was that against peace, the report continues. The bombing was in breach of international law that only recognises military force as an act of self-defence. The report cites the United Nations Charter Article I, paragraph I which explains that its main objective is: "To maintain international peace and security, and to that end: to take effective collective measures for the prevention and removal of threats to the peace, and for the suppression of acts or other breaches of the peace, and to bring about by peaceful means, and in conformity with the principles of justice and international law, adjustment or settlement of international disputes or situations which might lead to a breach of the peace."

It was to circumvent opposition within the United Nations Security Council that America launched its military offensive through NATO. At no stage can it be credibly argued that all means towards a peaceful settlement in the Kosovo conflict had been exhausted, the report insists.

The US committed over 700 of the 1055 aircraft used in Operation Allied Force and US aircraft flew more than 29,000 of the 38,000 sorties flown during the campaign. However, it is impossible to say whether it was US aircraft that bombed the facilities in Pancevo and Kragujevac as this information has not been declassified. Attempts by IEER to obtain the targeting criteria used during the bombings under the Freedom of Information Act was rejected by the US Department of Defense, which handed over 42 blank pages marked "classified". An analysis of Yugoslav bombing campaign carried out this year by the US General Accounting Office, the investigative arm of Congress, remains classified as well.



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