

TOXIC LEGACY IN RUSTAVI: A HIDDEN HEALTH CRISIS 2025

Impact of industrial pollution on local environment
and food chain in Georgia's industrial heartland



This summary is based on findings from the study Toxic Hot Spots in Rustavi (2025), produced by Arnika (Czech Republic) with a support of Gavigudet (Rustavi, Georgia).

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TRANSITION



SAMPLING LOCATIONS

1. RUSTAVI

(city and industrial zone)



Samples collected:

free-range chicken eggs (+ supermarket egg sample as reference), dust, soil and fish

Key findings:

- ▶ Highest levels of PCBs and dioxins in eggs (up to 35.7 pg WHO-TEQ/g fat)
- ▶ Total DDT in eggs up to 7,120 ng/g fat
- ▶ Dust contained lead and cadmium 24–26× above background
- ▶ Soil in playgrounds exceeded limits for zinc and cadmium

4. MTKVARI RIVER



Samples collected:

fish and sediment

Key findings:

- ▶ PCB concentrations in fish up to 18 ng/g fresh weight
- ▶ DDT concentrations up to 85.6 ng/g fresh weight
- ▶ Multiple hazardous substances detected together (e.g. PCBs, DDT, mercury)
- ▶ Cumulative exposure from fish consumption may pose health risks

2. TAZAKENDI

(village near industrial zone)



Samples collected:

free-range chicken eggs, fish and soil

Key findings:

- ▶ Total DDT in egg up to 279 ng/g fat
- ▶ PCBs in soil: 510 ng/g dm (highest in study)
- ▶ Fish with elevated PCBs (18 ng/g fresh weight) and DDT (85.6 ng/g fresh weight)

3. UDABNO

(remote reference site)



Samples collected:

soil and dust

Purpose:

Used as reference location with no known industrial activity

Key findings

Very low background levels of POPs and metals

TYPES OF SAMPLES



Free-range chicken eggs
(7 pooled samples)



Fish
(12, some of those pooled samples)



Soil or waste
(6), soil from children playground (7)



Street dust (5)



River and lake sediments (4)



Reference samples of soil (1),
dust (1) and eggs (1)

ABOUT THE RESEARCH

This summary is based on four scientific studies conducted by Arnika (Czech Republic) and partner organisations in 2023–2025, in cooperation with Georgian experts and laboratories. Researchers collected and analysed over 40 environmental and food samples in and around Rustavi. Samples were tested for a broad range of toxic substances, including:

- **Persistent Organic Pollutants (POPs):** Polychlorinated biphenyls (PCBs), dioxins and dioxin-like PCBs (PCDD/Fs, dl-PCBs), DDT and its metabolites, hexachlorocyclohexane (HCH), hexachlorobenzene (HCB), pentachlorobenzene (PeCB), hexachlorobutadiene (HCBd), brominated flame retardants (PBDEs, HBCD, novel BFRs), Dechlorane Plus (DP), and UV stabilizers.
- **Heavy Metals:** Mercury, lead, cadmium, arsenic, chromium, copper, and zinc.
- Selected samples (e.g. pooled eggs) were also analyzed using the DR CALUX® bioassay to determine dioxin-like activity and for the presence of **brominated dioxins and furans (PBDD/Fs)**.

All analyses were conducted by ISO/IEC 17025-accredited laboratories in the Czech Republic, the Netherlands, and Germany using internationally recognized methods (e.g. GC-MS, UHPLC-MS/MS, ICP-MS). These methods ensured the accuracy, reliability, and comparability of the results. Contamination levels were compared with international safety thresholds, and potential health risks were assessed, especially for vulnerable groups such as children and local food consumers.VBV

POSSIBLE SOURCES OF POLLUTION



Metallurgical
plants



Use of contaminated
materials in residential
areas



Cement
factories



Industrial waste dumps
and slag re-use



Suspected illegal use
of DDT and other banned
pesticides

SUMMARY

Four environmental studies conducted between 2023 and 2025 reveal alarming levels of toxic pollution in and around the industrial city of Rustavi. Persistent organic pollutants (POPs) such as PCBs, dioxins, DDT, and brominated flame retardants, as well as heavy metals like mercury, lead, cadmium and zinc, were detected in soil, dust, sediments, fish, and free-range chicken eggs. The results indicate both historical and ongoing pollution, posing significant risks to public health—especially for children and residents consuming locally produced food.

Key Findings

- **Dangerous chemicals found in food:** Free-range chicken eggs from the Rustavi area contain levels of dioxins, both dioxin and non-dioxin-like PCBs exceeding EU food limits by several times. Daily dose of eggs can expose a person to 3–4× more dioxins than the safe tolerable daily intake established by the European Food Safety Authority.
- **Children's playgrounds polluted:** Soils from Rustavi playgrounds show extremely high levels of banned pesticides (DDT) and industrial chemicals (PCBs), with some values exceeding background levels by up to 3,500 times. Zinc and cadmium also exceeded hygienic standards for children's sandboxes.
- **Toxic dust and soil in residential areas:** Street dust near industrial zones contains heavy metals like lead and cadmium at concentrations 20–25× higher than in clean areas. Chromium and zinc levels ranked among the highest reported in comparable international studies.
- **Contaminated river and fish:** Fish from the Mtkvari River carry worrying levels of legacy POPs and heavy metals. Although not everyone eats local fish, families who do may face increased health risks from long-term exposure. Levels of DDT and PCBs in sediments were several times higher than measured at riverine locations.
- **Signs of ongoing illegal pesticide use:** The chemical profile of DDT in soil and eggs suggests it is still being used or released today—despite its international ban decades ago.

THE POWER OF CIVIC ACTION

This research would not be possible without the commitment of independent environmental groups working under increasingly difficult conditions. Their role in uncovering pollution, educating local communities, and demanding better environmental standards is vital for protecting public health in Georgia. The Rustavi case is a powerful example of what local–international cooperation can achieve—and why it must continue.

TIME TO ACT

Rustavi's toxic legacy is not just a problem of the past—it's a daily risk for families, children, and the environment. The results clearly show that urgent action is needed to clean up contaminated sites, stop illegal pollution, and protect public health. Local people deserve clean air, safe soil, and healthy food—just like anywhere else.

RECOMMENDATIONS

- **Identify and stop pollution at the source:** Authorities shall investigate ongoing releases of banned chemicals like DDT and PCBs, and clean up legacy pollution near homes and public spaces.
- **Protect public health through food safety measures:** Issue consumption advisories for local fish and eggs, especially to protect children and pregnant women. Improve food safety monitoring in contaminated areas.
- **Clean up the most toxic areas:** Highly contaminated playgrounds, gardens, and soils should be remediated or fenced off to prevent exposure—especially for children.
- **Strengthen environmental monitoring and enforcement:** Introduce regular, transparent monitoring of POPs and heavy metals in air, soil, food, and water. Results must be accessible to the public and used to enforce laws. Georgia should introduce Pollution Release and Transfer Register (PRTR) to open data on pollution to the public.
- **Promote cleaner industry and better waste management:** Polluting factories must adopt best available techniques (BAT) and reduce emissions of toxic substances. The permits issues must be regularly updated. Require proper classification, storage, and disposal of industrial hazardous waste according to international standards, with regular inspections and penalties for violations.
- **Engage local communities and seek international support:** Involve residents in risk communication and participatory monitoring, for example by supporting citizen science. Leverage global funding and technical help for site remediation and clean-up efforts.



The full study **Toxic Hot Spots in Rustavi** is available for download here:

<https://arnika.org/en/publications/toxic-hot-spots-in-rustavi-georgia>



Scan the QR code to access detailed report.