FROM PRISTINE TO POLLUTED

HOW CHEMICALS AND POLLUTANTS DRIVE FISHERY DECLINES AND ECOSYSTEM COLLAPSE

Media Summary

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NTN NATIONAL TOXICS NETWORK

IPEN
for a toxics-free future

Fishery managers strive for sustainability of fisheries natural resources, but declining fisheries is a global problem. While overfishing continues to be problematic, other significant causes of this decline remain dangerously overlooked.

Our report, with three case studies of river ecosystems in Vietnam, Canada, and Australia, reviews the significant harmful effects on fisheries from toxic chemicals and demonstrates that chemicals and other pollutants worsen the productivity-degrading effect of overfishing. The report notes the triple planetary crises of biodiversity loss, climate change, and chemical pollution, and concludes that we urgently need stronger global and national regulations to stem the chemical assault on the world's fisheries.

KEY TAKEAWAYS FROM THE REPORT INCLUDE:

- The loss and devaluing of **Indigenous Peoples/First Nations' knowledge and values** following colonial occupation has been a significant driver of fisheries decline.
- The production of plastics and chemicals has **exceeded the "planetary boundaries"** for pollution, meaning that chemical pollution threatens the stability of the global ecosystem.
- The use of **pesticides and fertilizers**, toxic chemicals derived from fossil-fuels, is growing even as their use drives climate change, fisheries decline, and pollutes entire ecosystems.
- Corporate polluters benefit from current structures that allow them to **privatize profits while socializing the costs** of their destructive products, as the principle of "polluter pays" has rarely been adopted or enforced.
- Similarly, **governments favor corporate needs over environmental protection**, leading to weak or no regulations even in the face of dire consequences for fisheries. Fisheries are undervalued, with faulty, short-term economic arguments overriding the need for long-term sustainability.

CHEMICALS AND OTHER POLLUTANTS

The report identifies chemicals and other common pollutants that pose threats to fisheries. Some of these include:

1. **Pesticides:** Despite widespread calls for reducing toxic pesticide use, trends show increasing applications of these toxic chemicals globally, with increasingly toxic chemical formulations. Pesticides can cause acute or chronic mortality to aquatic life, reduce biodiversity, and lead to a loss of insects that serve as critical food resources for healthy fisheries. Herbicides contribute to death of microalgae, seagrass, coral and mangroves, and can harm fish health, leading to a loss of primary productivity and fishery declines.
2. **Plastics and plastic chemicals:** Plastics are derived from fossil-fuels and thousands of toxic chemicals go into different types of plastics, making the materials toxic environmental threats to fisheries and other ecosystems. Plastics used in fishing and fish farming can lead to toxic releases, and high levels of microplastics are found in major rivers, creating harm to microorganisms vital to the food web. Microplastics also adsorb chemicals in the environment and carry them across the planet, adding to chemical threats to fisheries.
3. **PFAS:** Per- and polyfluorinated alkylated substances (PFAS) are toxic chemicals used in hundreds of consumer products, including synthetic (plastic) carpets, clothes, and other materials. Called "forever chemicals" due to their environmental persistence, PFAS can accumulate in fish tissues and cause disease, harm reproductive capacity, and impact survival across generations.
4. **PBDEs:** Poly brominated diphenyl ethers (PBDEs) are toxic flame retardant chemicals used in many plastics (e.g., for electronics, car parts, and other uses). Like PFAS they are persistent and accumulate in the environment. PBDEs are endocrine disrupting chemicals (EDCs) that can disrupt an organism's natural hormones. In aquatic life, exposure can cause reproductive harm, inhibited growth, and neurological toxicity.
5. **Pharmaceuticals and chemicals in personal care products:** The use of pharmaceuticals and personal care products that contain toxic chemicals is increasing globally, yet wastewater treatment cannot fully eliminate these toxic chemicals. When wastewater is released, these drugs and chemicals pollute waterways and harm fisheries. Many common chemicals in personal care products are EDCs that can harm aquatic animals' reproductive capacity, immune systems, and can cause behavioral changes and physiological stress.

THREATENING PROCESSES

The report identifies **key threatening processes** and their impacts on fisheries, including, among others:

1. **Deforestation:** Normally a river's healthy streamflow will help dilute chemicals and other pollutants, but deforestation can lead to decreases in streamflow, allowing chemical contaminants to build up.
2. **Removal of native and riparian vegetation:** When native vegetation is removed, soil can erode, allowing greater waterway contamination from pesticides and fertilizers. Removal of vegetation on riverbanks (riparian vegetation) can increase sedimentation, smothering fish habitat, depleting feed resources, and promoting algal blooms.
3. **Drained wetlands:** Draining wetlands for construction creates inflows of stormwater pollution, leading to the collapse of vital ecological processes. Pesticides and fertilizers used when farms replace wetlands can also threaten fisheries. Drained acid sulfate soils boost toxic metal mobilisation, harming food webs and reducing keystone fish habitat.
4. **Mangrove and saltmarsh removal:** Ecosystem disruptions occur with mangrove and saltmarsh removal, leading to the collapse of vital ecological processes such as sediment stability, carbon and nutrient capture, prevention of coastal erosion, habitat refuge, and generation of aquatic food web and fishery production.
5. **Seagrass loss:** Seagrass meadows support humans with food, raw materials, and income, but seagrass loss leads to the collapse of vital ecological processes such as sediment stability, habitat, and aquatic food web production.
6. **Dams and road crossings:** Dams and dam construction lead to loss of habitat, modified stream flow, and changes in water temperature. Dams and road crossings can block fish from their natural reproductive strategies based on seasonal flow.
7. **Water extraction for human use:** Extracting water for local uses leads to altered volumes of water, with periods of lower flow leading to higher concentrations of pollutants that harm the health of waterways. Changed seasonal water flows affect natural fish migration and breeding, depleting populations.
8. **Toxic mining runoff:** Mining operations divert groundwater, with reduced stream flows, leakage of toxic tailings, and toxic discharges released when sites become flooded. Smelters also release toxics into waterways, impacting aquatic ecosystem health.

RECOMMENDATIONS

IPEN and NTN urge global and national governments to adopt strong regulations to end the threats to fisheries from toxic chemicals and other pollutants. The Precautionary Principle should be the basis for legislation that fully implements the four pillars of sound chemical regulation:

- **Right to Know:** the community has a right to know what is, or has been used and released, and the level of contamination of public resources such as water and air.
- **No data / No market:** when there is no chemical information, or an absence of testing technologies, there should be no right to use or release a chemical into the market.
- **Substitution and Elimination:** if there is a safer, better way of achieving outcomes, then this should be mandatorily substituted for toxic risks.
- **Polluter Pays:** Where pollution is emitted the polluter must pay for the full impacts caused. By their toxic products and practices, with the scale of costs incentivizing the elimination of the production and release of the pollutant.

See the full Synthesis report and case studies for detailed recommendations.

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