

Crossing the boundary

How can we solve our chemical problem?

1. Our planet is a remarkable one. As far as we know, it is the only place in the universe that is home to life. Other celestial bodies may be too hot, too cold or too unstable to host lifeforms such as humans, but the Earth has developed into an environment that is ideal for nurturing living things. Aside from being in the perfect location – just close enough to the Sun, but not too close – the planet has existed within a particularly stable state for the last 10,000 years, allowing diverse species to evolve and flourish. According to a scientific study conducted this year, however, things may be changing.
2. In 2009, a research team identified nine planetary boundaries that allow Earth's current phase of stability to continue. In 2015, they came to the conclusion that humanity has already breached four of these: driving species to extinction, replacing forests with farmland, releasing Greenhouse gases into the atmosphere and reducing soil quality through agriculture and industry practices. The recent study, led by Linn Persson of the Stockholm Environment Institute, suggests that human activity has been responsible for the breach of a fifth boundary – that of chemical pollution.
3. The study, a joint effort involving fourteen different authors from five different countries, concluded that, through the production of new chemicals, the release of pollutants into the ground and environment and the existence of synthetic substances in the food chain, we have crossed the boundary and are no longer within the safe operating space for humanity. Researchers looked at a variety of contributing factors, such as the increase in plastic waste (the total mass of plastic in the world now exceeds that of all living mammals, for example) and the massive increase in the production of chemicals on an industrial level. Some of the threats to our planet's stability have, to an extent, been tackled, such as the reduction of CFC chemicals responsible for the partial destruction of the Ozone layer.
4. The boundary itself is somewhat hard to define, as there is no baseline dating to pre-human times, unlike with climate change. Many of the chemical compounds currently registered for use haven't been tested for safety, and as such, it can be hard to quantify the destruction caused by chemical pollution. As such, researchers used a variety of measurement systems, such as the rate of production of new chemicals and the amount that were released into the environment. Although their findings were bleak, the team had some proposed solutions. Patricia Villarrubia-Gómez, a research assistant who was part of the research group suggested "shifting to a circular economy" in which materials and products are reused rather than wasted. The researchers also called for stronger regulation and fixed limits on chemical production and release.
5. The outlook for the future of our planet isn't great – at least, if we refuse to change our habits or modify our lifestyles. There is still hope that the changes we have inflicted on our home can be reversed. Scientific research is key to drawing attention to the many effects we are having on the Earth as we transition into the digital age. Already, there have been calls for international action on chemicals and plastics, and, broadly speaking, the public is more aware of the damage we are causing as a species than ever before. Now, we need to act, decisively and collectively, to nurture and care for the world just as it has looked after us.

1. Is the concept of “safe operating space for humanity” a useful framework for understanding the impact of human activity on the planet?
2. Should there be stronger regulations and limits on chemical production and release, even if it means reducing economic growth and affecting industries?
3. Is a circular economy the most effective solution to tackle the problem of chemical pollution, or are there other strategies that should be pursued?
4. Can the damage already inflicted on the planet be reversed through individual actions and lifestyle changes, or is international action and collective effort necessary for real change?
5. What are the ethical implications of breaching planetary boundaries? Should we prioritize the survival of humanity or the protection of the natural world?
6. To what extent do you think the responsibility for reversing the effects of chemical pollution lies with individuals versus governments and corporations? How can we balance personal responsibility with collective action?
7. Do you think the EU’s ban on substances is a good idea, or is it too little, too late?

We need to move away from the current model of capitalism for the sake of our planet. Alternative solutions, such as the creation of a circular economy should replace the constant production of new goods.