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Life in Plastic*

*Not Fantastic.
The Rise of Chemical Pollution.

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The United Nations Environment Assembly (UNEA) met at the end of February 2022 to discuss the ongoing problems of chemical and plastic pollution. At this meeting, the environment ministers from 193 Nations agreed to establish an ambitious science-policy panel for global management of chemical waste and pollution and, for the first time, to forge a worldwide and legally binding treaty for tackling plastic pollution[1, 24]. Work on this treaty, which will cover all stages of the plastic life cycle, is to begin this year, with a draft agreement to be completed by 2024[2].

Of course, chemical pollution is not purely caused by plastic production, with agriculture being one of the other leading contributors[25]. In fact, pollution from agrochemicals is one of the strongest factors linked to habitat collapse[26]. The new Value Alignment Tool (VAT) from ESG Book will allow investors to systematically screen over 29,000 companies on their revenues and business involvements from 7 overarching themes, with 36 different screens available. Within the Chemical theme, the VAT allows for the screening of assets involved in plastic, fertiliser, and pesticide production, tackling three of the leading causes of destructive chemical pollution.

Chemical pollution is not a recent problem, and global action is long overdue. Plastic production has been rising sharply since 1950 (figure 1), a trend projected to continue despite efforts introduced by many nations to curb plastic use. Much of this rise is driven by fossil fuel companies, which, between 2010 and 2017, invested more than 180bn USD into new plastic and plastic feedstock facilities[3].

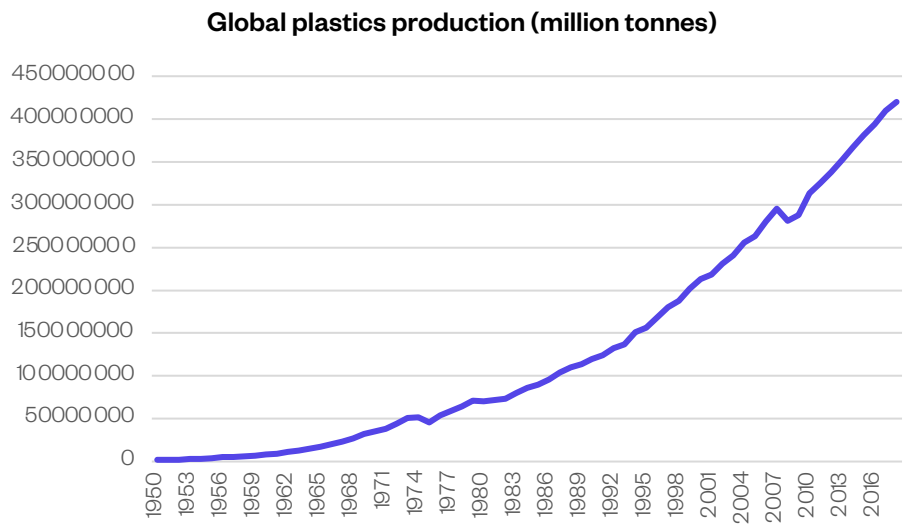

Figure 1. Global plastic production (in millions of tonnes) over time [4, 5, 6]

Government regulation can and does have a measurable impact on the more sustainable use of chemicals. For example, when Northern Ireland introduced a plastic bag levy in 2013, usage dropped by 71% within a single year[7] and, since banning plastic bags in a range of stores in 2016, beach clean-up events in California have reported a 72% decrease in plastic bags found[8]. It is clear, however, that progress so far still falls short of what is required. Under business-as-usual scenarios, the amount of mismanaged plastic waste worldwide is expected to double in the next 40 years[9], highlighting the need for targeted and measurable global regulation such as the UNEA is trying to introduce.

Similarly, swiftly changing agricultural practices and the move towards mass agriculture have led many farmers to increasingly rely upon chemical fertilisers and pesticides to generate the yields required to make a living, with the use of both rising by ~80% since 1990 (figure 2). This increased reliance on chemicals has led to a doubling of nitrogen compounds found passing between the water, soil, and air as part of the natural nitrogen cycle[14]. At the same time, 64% of global agricultural land is at risk of multiple forms of pesticide pollution[15].

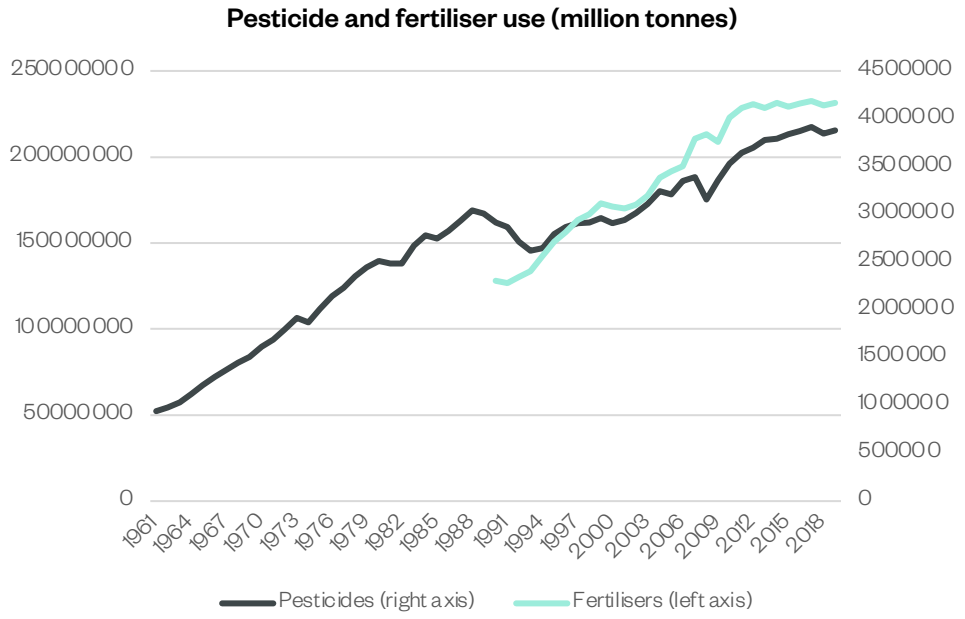

Figure 2. Pesticide (right axis) and fertiliser use (left axis) in million tonnes over time [4, 5, 6]

Plastic leeching (i.e., the transfer of chemicals from plastic into its surrounding environment, including into food and drink), fertiliser runoff and pesticide use each have multiple severe and well-documented consequences, not just on the local environments, but to human health at a global scale. 80% of nitrogen used in fertilisers is lost, primarily through runoff, poisoning local water systems and causing dead zones up to 6500 square miles in size[12], while long-term fertiliser use can decrease soil fertility and accelerate acidification[13]. Pesticides similarly impact their environment and, even further, they are toxic to almost all forms of life, including humans, with links to chronic and long-term illnesses such as Parkinson's, asthma, ADHD, and cancer.

And beyond this, research has shown that 11,000 people die each year from unintentional pesticide poisoning[16]. Finally, plastic waste likewise impacts the natural and human worlds alike, killing over 100,000 marine mammals, including 1000 turtles[17], and over 1 million seabirds[18] each year through direct ingestion alone. Beyond this, as plastic waste breaks down, it releases toxic chemicals into the soil, water, and air and is linked to infertility, diabetes, cardiovascular disease, obesity and more[19]. Indeed, plastic pollution is now so pervasive that microplastic fibres can be found in snow falling on Mount Everest[20] and in the placentas of unborn babies[21]. This trend cannot continue. Something must change.

The UNEA resolutions tackling plastic and other chemical pollution are a step in the right direction. But investors can play their part as well, with the awareness that addressing plastic and the associated waste is increasingly a focus for government and intra-governmental agencies. ESG Book's VAT is a valuable tool that enables investors to bring this awareness into their portfolios and investment decisions.

An analysis of the 29,000 companies in the VAT universe shows 241 companies involved in the production of pesticides, 282 in fertilisers, and 1113 in plastics. There is significant overlap between some of these companies, particularly pesticide and fertiliser production companies, which are likely to be involved in both activities and plastic production (figure 3). For example, around 57% of pesticide production companies are also engaged in fertiliser or plastic production, although only 19 companies in the universe are involved in all three.

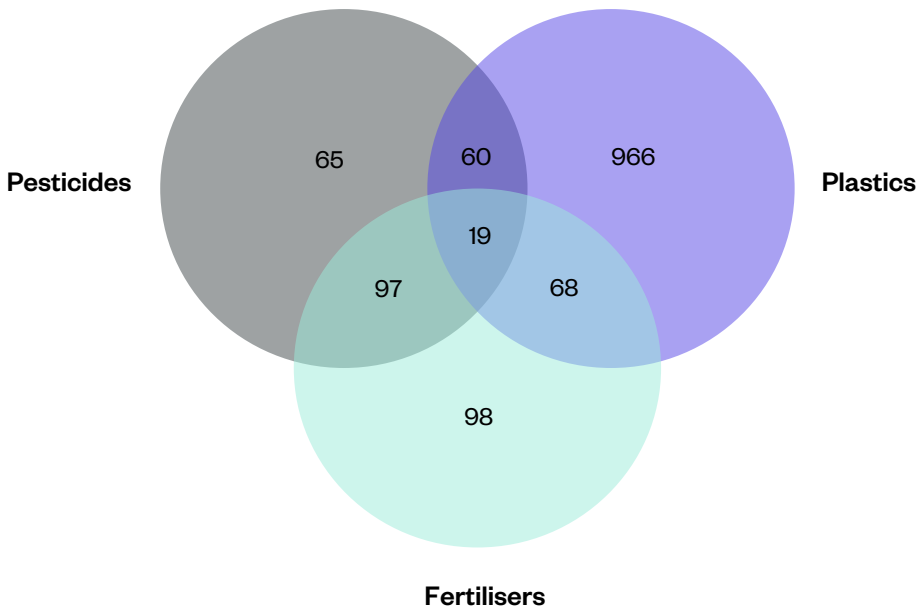

Figure 3. VAT Universe, overlap between Pesticide, Fertiliser and Plastics companies.

For all three screens, most identified companies are in Asia (figure 4), specifically in Japan and China (figure 5), where 32-39% of companies are found, depending on the screen in question. Following Asia, Europe and North America hold the next highest proportion of companies (23-28%), dominated by the United States.

	Plastic (%)	Pesticides (%)	Fertiliser (%)
Asia	70	64.7	64.9
Europe	13.4	13.3	12.8
North America	10.5	14.5	10.3
Middle East	2.7	2.1	4.3
Africa	1.4	1.2	3.5
South America	1.1	2.1	2.5
Pacific Rim	0.7	1.2	1.1
Central America	0.2	0.8	0.7

Figure 4. Regional breakdown of plastic, pesticide and fertiliser production.

	Plastic (%)	Pesticides (%)	Fertiliser (%)
Japan	20.8	13.8	10.0
China	18.2	18.4	29.0
United States	9.6	11.3	10.4
Taiwan	7.6	2.1	2.9
Korea	6.3	2.5	3.7
India	5.8	12.8	12.0
Thailand	2.4	1.1	3.3
Hong Kong	2.2	1.4	2.9
Germany	2.2	2.1	2.9
United Kingdom	1.9	1.1	0.4

Figure 5. Country breakdown of plastic, pesticide and fertiliser production.

Many of the identified fertiliser, pesticide and plastic production companies are from the expected industries - 44% of pesticide and 60% of fertiliser productions companies are from the chemical and agriculture sectors, while 25% of plastic production companies are from the chemical and packaging sectors. However, in all three cases, the remaining companies are spread across a wide range of industries, with plastic production identified in 89 different industries and pesticide and fertiliser production identified in 39 and 46, respectively.

Knowing that a broad range of companies is involved in these activities, the question becomes: is it a viable option to halt the production of harmful substances such as these? The simple answer is, in many cases, yes. Of course, the onus does not lie with investors alone. For this to succeed, reduced production must come in hand with increased government regulation, assistance to affected workers and industries, and coordinated global efforts such as that by the UNEA. But these changes are coming, so now is the time to act.

The introduction of pesticides and chemical fertilisers has caused more problems than it has solved. Their continued use has built an increasing reliance on them, which exacerbates the problem and costs farmers more every year[22]. But it does not need to be like this, and farmers can cut such chemicals out of agricultural practices. The return of traditional methods, including crop rotation and the use of natural pesticides, could reduce and remove the need for chemicals in farming, help to restore lost soil fertility, and even increase farm profitability[25].

Similarly with plastic, while it has many uses, being light, flexible, and recyclable if appropriately managed, much of what we produce we simply do not need. While we cannot immediately cut plastic out of some industries, for example, healthcare, estimates suggest that 50% of global plastic production is single-use and disposable [23] and even if this plastic is recycled, most of it can only be recycled once[26]. There is little argument to continue production as our current rates and, as evidenced by bans on single-use plastic, if production is stopped, society adapts.

Beyond this, research submitted this year has found that we have already passed the planetary boundary for chemical pollution[24], that is, the point at which human-made changes push us irrevocably outside of the stable environment we have enjoyed for the last 10,000 years. Therefore, it is clear that all actions that we can take, we take, and that, if we wish to limit the already unavoidable damage to our planet and our health, there is no time to waste.

For more information, visit esgbook.com or sign-up to our newsletter to get our latest insights and regulatory updates delivered direct to your inbox.

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