

# NATURE

## Does not Create Unnecessary Things

Zero waste is an idea challenging our way of thinking and functioning in the environment. It draws our attention to the fact that human activity should be associated with the responsibility for our lives and for the impact of our activities on the planet. The premise of zero waste is to minimize waste and to reuse the products we buy. Due to the fact that we use environmental resources, it is worth remembering that everything which is bought and consumed becomes waste. Hence, the emphasis on changing our habits and lifestyle is so important, but most of all it limits excessive consumerism.



text: Dr. Agnieszka Sikora



Prof. Piotr Skubała  
Institute of Biology, Biotechnology and Environmental Protection  
Faculty of Natural Sciences  
University of Silesia  
[piotr.skubala@us.edu.pl](mailto:piotr.skubala@us.edu.pl)







American biologist Barry Commoner formulated four laws of ecology in his 1971 book *The Closing Circle: Nature, Man, and Technology*. The second law states: “Everything must go somewhere.” This is how our planet works – everything that is created is a source of energy and matter for another being. For example, carbon dioxide released by animals is essential for plants, whereas oxygen released by plants is detrimental for animal life. Nature does not create unnecessary things, and nothing is wasted in nature.

“The human species often misuses its wisdom. We have learned to create unnecessary things,” says Prof. Piotr Skubała, a biologist at the University of Silesia, ecologist, environmental ethicist, popularizer of science, ecology educator, environmental conservationist, and climate activist.

A disturbing signal pertaining to our attitude to waste is its continuously growing amount. Currently we throw away 332 kg of waste annually per person. The average amount of municipal waste in Europe in 2018 was nearly 500 kg per inhabitant. In Denmark this figure was as much as 800 kg, in Norway and Switzerland – about 700 kg. Waste management on a national scale is not at its best, either. In total, 25% of our waste is recycled, 9% composted and fermented, 23% incinerated, and 43% finds its way to landfills.

Waste separation lulls our conscience. Research shows that people feel bad if they create unnecessary waste, and their well-being improves when they have the ability to recycle. This self-perception is becoming so positive that we buy an increasing number of products and throw away even more waste. This is demonstrated by an experiment conducted on a group of Boston college students, who were offered four different juices to taste. They had to pour these drinks themselves into disposable cups. A regular trash can was placed next to one group, and a plastic recycling garbage can next to the other group. Students who had the option to separate waste used an average of 3.5 cups; the rest used only 2.7 cups. Therefore, we use more if we

know that the resources used will be recycled. However, we forget that the recycling process also uses environmental resources and energy. Above all, we should emphasize the rather high cost of recycling as well as the need to reduce the consumption of resources and to minimize the amount of things that each of us buys and throws away.

## PLASTIC PLANET

Plastic is, of course, a classic example of human-made waste. It is a product that is literally flooding our planet, and nature has no tools to remove it.

In all parts of the world, the year 2020 will certainly be remembered as the year of the pandemic, but we should also bear in mind another aspect which pertains to it. This was the year when the amount of anthropogenic mass, the so-called anthropomass (mainly concrete, aggregate, e.g. gravel, but also bricks, asphalt, metals, waste, glass, plastic) equaled the amount of biomass on Earth.

As recently as the beginning of the 20<sup>th</sup> century, anthropogenic mass accounted for merely 3% of global biomass. About 120 years later, it began to dominate over the mass of living organisms. Since the 1970s, we have seen its exponential growth which doubles every 20 years. The mass of plastics (8 Gt) is now twice as high as the mass of animals. The mass of buildings and infrastructure (1100 Gt) is already higher than the biomass of trees and shrubs on the planet (900 Gt). On Earth, we have 1 km of concrete per square meter of the planet, including the oceans. Unfortunately, the forecasts for a further increase in the anthropogenic mass are not optimistic. If after the pandemic we continue to do *business as usual*, by 2040 this mass (including waste) will be three times the biomass on Earth.

The zero waste idea also calls for limiting consumerism. Of course, the level of consumerism is particularly high in rich countries or societies. However, this does not mean that there are

no waste problems in poorer countries – quite the contrary. What is this paradox about? In richer countries, a certain amount of waste is recycled, while in poorer countries, mainly in Asia and Africa, there is hardly any control over waste, and barely any recycling takes place. Most of the plastics that end up in the oceans (because that is their final destination) come from countries such as China and India. The current situation in the world is that 9% of the plastics we have produced has already been recycled, which means that with about 90% nothing has been done, and it is located probably somewhere in the oceans. In Poland and in the European Union in general, the situation is a bit better, since we recycle about 30% of plastics, but this is not much either.

## THERE IS WASTE OTHER THAN PLASTIC

We focus on an individual approach to waste and recycling, and this solves the problem of waste on a global scale merely to a small extent. As it turns out, industrial waste accounts for about 91% of waste generated in Poland. Mining (56%), manufacturing (24%), energy (12%), sewage and waste management (5%) and construction (3%) produce the most. As much as 45% of industrial waste remains on landfills. It includes all sorts of chemicals, including toxic ones, which are created as a byproduct of manufacturing processes.

Therefore, the economy must be radically transformed. Unfortunately, it is linear economy based on the principle “take, produce, consume, throw away” that currently prevails. We should strive to turn it into circular economy, a concept which says that products, materials, and raw materials should be left in economy as long as possible and waste generation should be minimized. In circular economy, it is essential that waste, after being produced, is treated as secondary raw materials.



## THE APOCALYPSE

There are numerous predictions by scientists according to which the apocalypse is drawing nearer. One vision was created by Chilean computer scientists who work with mathematical simulations. They took into account one factor – deforestation – and calculated that at the current rate, human civilization will be annihilated in 20-40 years. Algorithms also calculated the chance that the human species will survive this apocalypse, and it turned out that it amounts to 10%. We are living in a period of great species extinction. In a 2016 article in the journal *Nature*, scientists pointed out

10 factors of human activity that contribute to this situation [“The Ravages of Guns, Nets, and Bulldozers.” Maxwell S.L., Fuller L.A., Brooks T.M., Watson J.E.M. 2016. *Nature* (536) 2016]. One of the factors is waste, which made it to the 5<sup>th</sup> place on the list of the so-called big killers. The first place was taken by the exploitation of environmental resources, logging, hunting, fishing, gathering; the second by agriculture, industrial production, farming, industrial livestock breeding; the third by urbanization and infrastructure, i.e. concrete and cement. On the subsequent places we find invasive species and diseases, environmental pollution (including municipal and

industrial waste), changes in ecosystems, climate change, direct human activities (recreation, work, war), transport, and energy production.

“We are a civilization that creates artificial things and displaces what is valuable, that is, life,” remarks Prof. Piotr Skubała. “Therefore, the idea of zero waste, next to the climate crisis, is now becoming a key issue. We are facing a significant amount of work to raise public awareness with regard to the importance of combating waste. However, it must be emphasized that our individual behaviors are important but not sufficient. Systemic action is needed above all.”

On a global scale, we have produced **8.3 billion tons** of various types of plastics, of which **6.3 billion tons** are now plastic waste. Every year, **8 million tons** of plastic waste are thrown into the seas and oceans. It is as if we put 15 shopping nets filled with plastic on every square meter of coastline every year. There are now six great islands made of plastic waste on the surface of the oceans. The largest of these, **the Great Pacific garbage patch**, has an area of **1.6 million square kilometers**. This area is five times larger than the surface area of Poland, six times larger than the area of the UK, or slightly less than the area of Alaska, the largest US state.

