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Unsustainable global consumer demands drive primate extinction

////Stand-first: Global market demands for forest-risk commodities such as soy, palm oil, beef, rubber, metals, minerals, gemstones and fossil fuels from Central and South America, Africa and Asia have increased significantly over the past 20 years, representing over four trillion US dollars in 2016 alone. Driven by the overconsumption of a small number of consumer nations, this global trade is responsible for the permanent conversion of native forests into monocultures and pastures, leading to polluted, fragmented and degraded habitats that are unsuitable for wildlife. Dr Alejandro Estrada at the National Autonomous University of Mexico, Dr Paul Garber at the University of Illinois-Urbana and Dr Abhishek Chaudhary at the Indian Institute of Technology investigate how this trade affects primate species and what can be done to prevent further primate population declines.

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The trade of global forest-risk commodities has become a vital source of income for many primate-habitat countries around the world. Each year, products such as soy, palm oil, natural rubber, timber, beef, land-based fossil fuels and minerals are exported by developing countries to a small set of consumer nations, whose citizens and societies benefit by the increased availability of raw materials and an abundance of food. This trade has more than doubled since 2000, with four trillion US dollars of natural resource commodities traded in 2016.

This may sound like good news for all countries involved. However, Dr Alejandro Estrada, Dr Paul Garber and Dr Abhishek Chaudhary recently published a paper in *PeerJ* that directly contradicts this assumption. By analysing several international databases, these researchers found that as multinational corporations exercise greater control of international supply chains and incentivise the conversion of tropical forests for industrial agricultural development, local businesses are pushed out, and profits move away from producer countries and toward consumer countries. This means that the majority of citizens in these producer countries, which tend to be developing nations, remain poor, with low incomes, increased food insecurity and limited access to education or healthcare.

To make matters worse, the environmental costs of production are also endured by producer countries. For many nations in Central and South America, Asia and Africa, the need to keep up with global demand and to raise their economic standing leads to intensive industrial farming, the creation of pasturelands and the overuse of rangelands, principally for beef production, logging, mining and fossil fuel extraction.

Countries in these regions are often pressed by global markets to convert highly biodiverse and vibrant tropical rainforest forests into monocultures and polluted, fragmented landscapes, resulting in rapid and widespread deforestation. From 2001 to 2017, Dr Estrada, Dr Garber and Dr Chaudhary found an alarming loss of 179 million hectares of forest – an area greater than the size of Germany, France, Italy and Spain combined.

This type of land conversion significantly reduces biodiversity and threatens many animal and plant species with extinction due to habitat loss. Meanwhile, the destruction of forests, which absorb carbon from the atmosphere, also exacerbates climate change.

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Many of the countries affected by these global trade networks are home to large numbers of primate species, which are negatively impacted by increasing rates of deforestation. For example, Dr Estrada, Dr Garber and Dr Chaudhary highlight a study estimating that an additional 400 million hectares of African forest will be converted to palm oil plantations by 2050, threatening over 40 species of African primates, including gorillas, chimpanzees and bonobos. In Southeast Asia, orangutans and other primates are already severely threatened by oil palm plantations.

As the researchers explain in their paper, growing international trade in tropical hardwoods has led to an increase in logging activities, accompanied by the construction of new road networks into areas humans were not able to reach before. Some primates are able to survive temporarily in logged areas, but most cannot adapt, and their survival in the long term is doubtful.

The researchers highlight that the mining of metals and minerals is another persistent threat to primates and their habitats. Mining brings its own set of problems related to the pollution of soil and groundwater, as well as civil conflict. In the Congo, for example, illegal mining occurs in several national parks to accommodate the global demand for minerals such as tantalum and gold for computers and other electronic devices. Bushmeat hunting is also widespread in these areas, often to feed communities of illegal miners, and has devastated entire populations of chimpanzees, gorillas and other species.

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Extrapolating from these results, Dr Estrada, Dr Garber and Dr Chaudhary modelled various scenarios for the future. The team predicted that if we maintain the status quo, by 2050, we will see a significant increase in the number of threatened primate species. Based on current trends, the team also found that by 2100, forest-risk commodity resource extraction will result in the extinction or near extinction of 80–100% of primate species in nine of the top 15 primate-richest countries in the world.

The good news is that there is still time to put in place options to guarantee a sustainable future for both human and nonhuman primate communities. In their paper, Dr Estrada, Dr Garber and Dr Chaudhary suggest that eating less meat, reducing waste and ending our dependence on fossil fuels are ways to limit commodities trade. Combined with projects that stop deforestation, promote forest restoration, develop sustainable agriculture, and improve the wellbeing of people in developing nations, these measures may be enough to prevent further species from going extinct. Unsurprisingly, this scenario requires significant changes in the way we live.

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According to the researchers, a major problem is that this trade in commodities is controlled by a small number of international companies, mostly from G-20 countries. In fact, just 10 countries accounted for 95% of the \$455 billion dollars traded in 2016, of which China and the US were responsible for more than half.

To mitigate this crisis, Dr Estrada, Dr Garber and Dr Chaudhary suggest several ways to make this trade 'greener'. One option is for governments to add the environmental cost of production to the retail price, which would provide a guaranteed source of income for producer countries to use in conservation projects aimed at restoring natural habitats and protecting biodiversity. In addition, recent attempts by the EU to ban trade in illegal timber and their 2017 resolution to ban the purchase of palm oil for biofuel production are important steps in limiting deforestation.

A second suggestion involves the creation of an international conservation fund created by consumer nations and administered by an international body, such as the United Nations. Sponsoring projects to protect the land can have multiple benefits, not just for primates but also for people living nearby, by promoting community-managed forests and providing alternative sources of income for people in local communities.

Above all, Dr Estrada, Dr Garber and Dr Chaudhary believe that there is an urgent need for all countries involved to form a united front to find ways of minimising the impact of unsustainable commodities trade on primate habitats and biodiversity. They explain that a balance needs to be achieved whereby global market demands for forest-risk commodities are reduced, while the needs of poorer countries to develop their internal economies and ensure sustainable food security must become a global priority.

Ensuring the survival of our closest living relatives, nonhuman primates, will also help to protect our environment, thereby ensuring the survival of humans as well.

Meet the Researchers

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This SciPod is a summary of the paper 'Expanding global commodities trade and consumption place the world's primates at risk of extinction', from *PeerJ*. <https://peerj.com/articles/7068/>

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