The double-edged sword of palm oil

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Researchers have found strong evidence that oil palm production gains in Cameroon are coming from extensification instead of intensification. Possible solutions for reversing the trend include improving crop and processing yields by using more high-yielding seed types, replanting old plantations and upgrading milling technologies. Credit: iStock

Widespread cultivation of oil palm trees has been both an economic boon and an environmental disaster for tropical developing-world countries. New research points to a more sustainable path forward through engagement with small-scale producers.

Nearly ubiquitous in products ranging from cookies to cosmetics, palm oil represents a bedeviling double-edged sword. Widespread cultivation of oil palm trees has been both an economic boon and an environmental disaster for tropical developing-world countries, contributing to large-scale habitat loss, among other impacts. New Stanford-led research points the way to a middle ground of sustainable development through engagement with an often overlooked segment of the supply chain.

"The oil palm sector is working to achieve zero-deforestation supply chains in response to consumer-driven and regulatory pressures, but they won't be successful until we find effective ways to include small-scale producers in sustainability strategies," said Elsa Ordway, lead author of a Jan. 10 *Nature Communications* paper that examines the role of proliferating informal oil palm mills in African deforestation. Ordway, a postdoctoral fellow at The Harvard University Center for the Environment, did the research while a graduate student in Stanford's School of Earth, Energy & Environmental Sciences (Stanford Earth).

An oil palm plantation in Cameroon. Credit: Elsa Ordway

Using remote sensing tools, Ordway and her colleagues mapped deforestation due to oil palm expansion in Southwest Cameroon, a top producing region in Africa's third largest palm oil producing country.

Contrary to a widely publicized narrative of deforestation driven by industrial-scale expansion, the researchers found most oil palm expansion and associated deforestation occurred outside large, company-owned concessions, and that expansion and forest clearing by small-scale, non-industrial producers was more likely near low-yielding informal mills, scattered throughout the region. This is strong evidence that oil palm production gains in Cameroon are coming from extensification instead of intensification.

Possible solutions for reversing the extensification trend include improving crop and processing yields by using more high-yielding seed types, replanting old plantations, and upgrading and mechanizing milling technologies, among other approaches. To prevent intensification efforts from inciting further deforestation, they will need to be accompanied by complementary natural resource policies that include sustainability incentives for smallholders.

A worker in East Kalimantan, Indonesia, loads palm fruit for transport to a factory that will process it into palm oil. Credit: Joann de Zegher

In Indonesia, where a large percentage of the world's oil palm-related forest clearing has occurred, a similar focus on independent, smallholder producers could yield major benefits for both poverty alleviation and environmental conservation, according to a Jan. 4 *Ambio* study led by Rosamond Naylor, the William Wrigley Professor in the School of Earth, Energy & Environmental Sciences and a senior fellow at the Stanford Woods Institute for the Environment and the Freeman Spogli Institute for International Studies (Naylor coauthored the Cameroon study led by Ordway).

Using field surveys and government data, Naylor and her colleagues analyzed the role of small producers in economic development and environmental damage through land clearing. Their research focused on how changes in legal instruments and government policies during the past two decades, including the abandonment of revenue-sharing agreements between district and central governments and conflicting land title authority among local, regional and central authorities, have fueled rapid oil palm growth and forest clearing in Indonesia.

They found that Indonesia's shift toward decentralized governance since the end of the Suharto dictatorship in 1998 has simultaneously encouraged economic development through the expansion of smallholder oil palm producers (by far the fastest growing subsector of the industry since decentralization began), reduced rural poverty, and driven ecologically destructive practices such as oil palm encroachment into more than 80 percent of the country's Tesso Nilo National Park.

Among other potential solutions, Naylor and her coauthors suggest Indonesia's Village Law of 2014, which devolves authority over economic development to the local level, be re-drafted to enforce existing environmental laws explicitly. Widespread use of external facilitators could help local leaders design sustainable development strategies and allocate village funds more efficiently, according to the research. Also, economic incentives for sustainable development, such as an India program in which residents are paid to leave forests standing, could make a significant impact.

There is reason for hope in recent moves by Indonesia's government, including support for initiatives that involve large oil palm companies working with smallholders to reduce fires and increase productivity; and the mapping of a national fire prevention plan that relies on financial incentives.

"In all of these efforts, smallholder producers operating within a decentralized form of governance provide both the greatest challenges and the largest opportunities for enhancing rural development while minimizing environmental degradation," the researchers write.

More information: Rosamond L. Naylor et al. Decentralization and the environment: Assessing smallholder oil palm development in Indonesia, *Ambio* (2019). DOI: 10.1007/s13280-018-1135-7

Elsa M. Ordway et al. Oil palm expansion and deforestation in Southwest Cameroon associated with proliferation of informal mills, *Nature Communications* (2019). DOI: 10.1038/s41467-018-07915-2

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