Press Release
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Advancing agriculture threatens the livelihoods of forest-dependent people in the South American Gran Chaco

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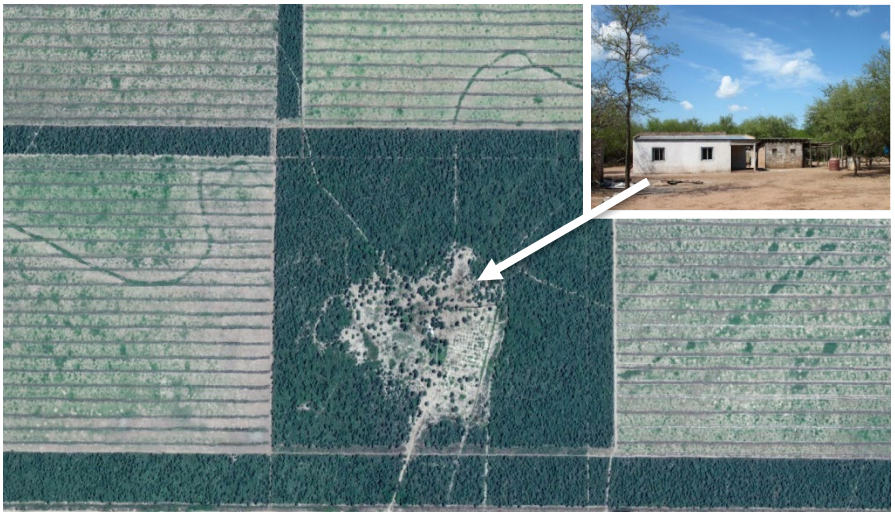
Agricultural expansion into tropical forests leads to major environmental destruction, but the social impacts of deforestation often remain hidden. A main reason for this is a lack of data on where people live inside tropical forests. New research published in the Proceedings of the National Academy of Sciences *shows how putting these people on the map is possible. Identifying the homesteads of forest-dependent people from satellite images across the entire South American Gran Chaco showed that these communities are found across huge areas of forests. Where agriculture advances, their livelihoods are threatened. In the Chaco, the result is 'ecological marginalization' via the destruction of the forest that these communities rely on, and their displacement to marginal lands. Mapping forest-dependent people is a much-needed step to better consider them in sustainability planning.*



Satellite images reveal where forest-dependent people live inside the forests of the South American Gran Chaco, and how deforestation for cattle ranching leads to an erosion of their resource base. (Background photo: Google Earth™ / Inset photo: I. Gasparri).

There are few places on the globe where tropical forests are disappearing as rapidly as in the South American Gran Chaco, a tropical dry forest region three times the size of Germany. Deforestation there mainly happens for the production of beef and soybeans for international markets, including for Germany. This causes widespread environmental destruction and globally relevant carbon emissions, which have been widely documented, but the

social impacts of deforestation often remain hidden. This is a huge problem, because many local people living in the Chaco, including the last uncontacted Indigenous People outside Amazonia, crucially depend on its forests.

A new study by researchers at the Geography Department of Humboldt-University Berlin, and from Argentina, Canada, and the Netherlands for the first time puts these forest-dependent people on a map. Using high-resolution satellite images, the team digitized individual homesteads of forest-dependent people across the Chaco and tracked what happened to these homesteads over a 30-year period. "We estimate that there were about 28,000 homesteads in 1985, spread across almost half of the Chaco forests", explains Dr. Christian Levers, a former postdoctoral researcher at HU Berlin and now an Assistant Professor at VU Amsterdam, and lead-author of the study. "This was a surprising result and shows that Chaco forests are far from being empty lands." Forest-dependent communities in the Chaco use the forests surrounding their homesteads in many ways, for example for firewood and timber, livestock grazing, subsistence hunting, or collecting honey. According to the researchers, advancing agribusiness agriculture has put enormous pressure on forest-dependent people. "Since 1985, more than 5,000 homesteads have disappeared", Levers explains. "But even more importantly, many more homesteads lost the forests in their surrounding due to agriculture expanding around them – forest on which they depend."

A key finding of the study is that deforestation leads to an increasing ecological marginalization of forest-dependent people. "What we mean here is that local people experience a massive erosion of their livelihood basis as the forest is converted", Prof. Tobias Kuemmerle from Humboldt-University Berlin, senior author of the study, explains. "We could also show that those homesteads that persist or have emerged are often in places that are not very suitable for agriculture, which is another form of marginalization". Kuemmerle summarizes.

Hotspots of disappearing homesteads were mainly located where agribusiness agriculture expanded most drastically. "This clearly shows how our consumption impacts on forest-dependent people around the world, people who are vulnerable and poor", Dr. Alfredo Romero-Muñoz, a researcher at HU's Geography Department and co-author of the study, states. "Agriculture expands into many tropical dry forests around the world, and we urgently need to consider the impacts this has on forest-dependent people more seriously – alongside the huge impacts on biodiversity and the global climate." According to the researchers, mapping where forest-dependent people live and how deforestation impacts on

them is a first and much-needed step to more adequately representing them in land-use planning and policy discussions.

Publication

Christian Levers, Alfredo Romero-Muñoz, Matthias Baumann, Teresa De Marzo, Pedro David Fernández, Néstor Ignacio Gasparri, Gregorio I. Gavier-Pizarro, Yann le Polain de Waroux, María Piquer-Rodríguez, Asunción Semper-Pascual, Tobias Kuemmerle (2021): Agricultural Expansion and the Ecological Marginalization of Forest-Dependent People, *Proceedings of the National Academy of Sciences*, Volume 118, https://doi.org/10.1073/pnas.2100436118

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