

Fewer cows, more trees and bioenergy

August 8 2019



Credit: CC0 Public Domain

Combatting global warming will require major changes in land use, a new climate change report says. One important change could be decreasing the amount of land used to produce livestock—which means that people would have to eat less meat.

Francesco Cherubini likes to ask his Industrial Ecology students what's the most common use of land today, and nearly all of them get the answer wrong.

"The correct answer is grazing land," Cherubini, a professor and director

of NTNU's Industrial Ecology Programme. "Today we are using nearly half of the land on our planet to feed animals and not people."

Cherubini has more than an academic interest in this question—and what the answer means. He's one of the lead authors of the IPCC's new special report, released today, on Climate Change and Land, and was the only author from a Norwegian-based institution.

He formally handed the report over to Ellen Hambro, Director General of the Norwegian Environment Agency, and Ola Elvestuen, Minister of Climate and Environment on Thursday, when the IPCC released the report in Geneva.

The IPCC describes the report as an "assessment of the latest scientific knowledge about climate change, desertification, land degradation, sustainable land management, [food security](#), and greenhouse gas fluxes in terrestrial ecosystems."

The report also looks at the interrelationships between different competing land uses and how these could affect future potential climate outcomes.

Cherubini says the report offers policymakers yet more reasons to act on curbing greenhouse gas emissions and taking action to make sure that [land use](#) plays a positive role in solving the climate problem—and acting sooner rather than later.

"Land management is key for us to achieve our climate management objectives," he said. "But we have competing land uses and limited land resources: we rely on land for animal feed, food, fibres and timber, and we need to preserve biodiversity and all the ecosystem services that land provides. And on top of that we have climate change."

The new report is an analysis of more than 7000 publications and looks at possible future scenarios to suggest the kinds of changes that need to happen under different socioeconomic situations, assuming society tries to limit warming to 1.5 C.

Using these scenarios allowed Cherubini and his co-authors to see what kinds of actions would need to be taken—and when—to keep warming to the 1.5 C goal.

For example, if society changes to a more plant-based diet, more efficient agriculture and food production systems and embraces new cleaner energy technologies, this will make land available for key climate change mitigation measures such as growing more trees or bioenergy crops.

"We'll need a lot of land for [climate](#) change mitigation," he said, no matter what.

Even in the most sustainable future scenario that will allow us to meet the 1.5-degree goal, the amount of forest land needed to soak up CO₂ by the end of this century will top out at about 7.5 million km², or roughly the size of Australia, Cherubini said.

In contrast, when the researchers looked at a more resource-intensive future scenario, they found it will be necessary to devote 7.5 million km² of land to bioenergy crops as early as 2050 to keep warming below 1.5 C. Another important component of using bioenergy under this scenario, he said, is that it will have to be coupled with more and earlier carbon capture and storage.

However, under all the scenarios, land has to be used for both bioenergy and for forest growth, as well as for food production and other human uses, Cherubini said.

"Bioenergy needs to be put in place with all the other [climate change](#) mitigation options to achieve the 1.5 C goal," he said. "We shouldn't think of this as a competition for land between forest and energy crops. We need both."

When Cherubini and his colleagues looked at the different scenarios, they were also able to assess how these different futures would affect different parts of the globe in terms of food insecurity, land degradation and other negative impacts.

This allowed the scientists to provide an assessment of "how we do this in the best way possible," Cherubini said. "We have a choice in the kinds of risks we will experience based on what kind of socioeconomic development takes place."

If society doesn't develop in a sustainable way, he said the risk of land degradation and food insecurity is much higher, especially in developing countries. Additionally, mitigation efforts have to be designed carefully to make sure they have a beneficial effect, he said.

One example of how a well-intentioned programme can have unwanted or unanticipated effects is China's "Grain for Green" programme, a massive tree-planting effort.

Under all the social development scenarios, planting trees to soak up carbon is important to curb global warming. It's also a tool used to reverse soil erosion [land degradation](#), which is one reason why China undertook its programme.

But in the case of China's efforts, at least some of the trees they planted were non-native. That meant that the trees took up more water than a native tree would have, and have increased the risks of causing other problems, such as water shortages, Cherubini said.

One aspect of the new report that has generated the most attention is the suggestion that societies move to more vegetarian diets.

"Balanced diets, featuring plant-based foods, such as those based on coarse grains, legumes, fruits and vegetables, nuts and seeds, and animal-sourced food produced in resilient, sustainable and low-GHG emission systems, present major opportunities for adaptation and mitigation while generating significant cobenefits in terms of human health," the summary for policymakers says.

Cherubini says it's clear that societies need to embrace this kind of change, along with improving and intensifying agricultural production.

Especially in places like Africa, where there is a gap between what the land could potentially produce and what is produced, there's a great need for improvements, he said.

"We need to produce more with less so that land is available for other uses," he said. "What is clear, is that we need to change. We need cross-sectoral changes in our lifestyles and in our economies."

Although these changes will cost money, the IPCC report emphasizes that the costs of inaction will exceed the costs of immediate action in many areas. That means that money spent now can be seen as a sound investment, he said.

"These changes do not come for free, they do have a cost," he said. "But should we talk about costs, or should we rather call it an investment?"

More information: IPCC Report—Climate Change and Land:
www.ipcc.ch/report/srccl/

Provided by Norwegian University of Science and Technology

Citation: Fewer cows, more trees and bioenergy (2019, August 8) retrieved 10 April 2024 from <https://phys.org/news/2019-08-cows-trees-bioenergy.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.