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Humans use or abuse quarter of all energy from plants

- Study casts new doubt on search for biofuels
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Nearly a quarter of the energy processed by land plants is either harvested by humans or lost due to our activities, according to a global analysis of agricultural production. In parts of the world where human activity is most intense, such as Europe and southern Asia, more than half the energy processed by plants is appropriated by people.

The figures show the remarkable extent of humankind's stranglehold over nature, but the researchers say they also indicate how difficult it will be to increase agricultural production to feed an ever-growing global population or find sources of biofuel to replace oil and gas - seen by some as a way to reduce fossil fuel use and hence slow global warming.

"This work provides yet further evidence of the huge impact that humans are having on the planet's life support systems," said Prof Chris Rapley, director of the British Antarctic Survey, who was not involved in the study. "The underlying issues are the recent extraordinary rise in the numbers of human beings - now at 6.5 billion - and the unsustainable manner in which we collectively behave."

The global population is increasing at 80 million a year and is due to level off by mid-century at eight to 10 billion.

The researchers used huge data sets from the UN's Food and Agriculture Organisation on agricultural production in 161 countries and combined this with a global climate model which predicted the natural productivity of different climatic regions if they were not converted to agriculture. "We wanted to quantify the human domination of ecosystems," said team member Karlheinz Erb at Klagenfurt University in Vienna. The results are published in the Proceedings of the National Academy of Sciences.

He said he was surprised at where the most exploited regions of the planet are. In south Asia 63% of plant production is used or destroyed by humans, suggesting that countries such as India have little hope of increasing agricultural productivity.

Another problem highlighted by the analysis is the limited potential for producing energy from biofuels. The researchers say their analysis shows it will not be possible to produce significant quantities of fuel this way without taking more energy away from natural ecosystems and so impacting on biodiversity.

"The additional harvest ... needed to achieve this level of bioenergy use would almost double the present biomass harvest and generate substantial additional pressure on ecosystems," the team write.

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