

# Global food crisis looms as climate change and population growth strip fertile land

. 'Ignorance, need and greed' depleting soil . Experts warn competition will lead to conflict

**Ian Sample in science correspondent**

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Climate change and an increasing population could trigger a global food crisis in the next half century as countries struggle for fertile land to grow crops and rear animals, scientists warned yesterday.

To keep up with the growth in human population, more food will have to be produced worldwide over the next 50 years than has been during the past 10,000 years combined, the experts said.

But in many countries a combination of poor farming practices and deforestation will be exacerbated by climate change to steadily degrade soil fertility, leaving vast areas unsuitable for crops or grazing.

Competition over sparse resources may lead to conflicts and environmental destruction, the scientists fear.

The warnings came as researchers from around the world convened at a UN-backed forum in Iceland on sustainable development to address the organisation's millennium development goals to halve hunger and extreme poverty by 2015.

The researchers will use the meeting to call on countries to impose strict farming guidelines to ensure that soils are not degraded so badly they cannot recover.

"Policy changes that result in improved conservation of soil and vegetation and restoration of degraded land are fundamental to humanity's future livelihood," said Zafar Adeel, director of the international network on water, environment and health at the UN University in Toronto and co-organiser of the meeting.

"This is an urgent task as the quality of land for food production, as well as water storage, is fundamental to future peace. Securing food and reducing poverty ... can have a strong impact on efforts to curb the flow of people, environmental refugees, inside countries as well as across

national borders," he added.

The UN millennium ecosystem assessment ranked land degradation among the world's greatest environmental challenges, claiming it risked destabilising societies, endangering food security and increasing poverty.

Some 40% of the world's agricultural land is seriously degraded. Among the worst affected regions are Central America, where 75% of land is infertile, Africa, where a fifth of soil is degraded, and Asia, where 11% is unsuitable for farming.

The majority of soil erosion is caused by water, either through flooding or poor irrigation, with the rest lost to winds. Farming practices such as ploughing also damage soil, as does repeated planting in fields, which depletes the soil of nutrients.

"You can sum it up as need, greed and ignorance," said Andrew Campbell, an Australian environmental consultant. "Some pressures on soil resources come from simple human needs, where people don't have any option but to grow crops or farm animals. But in other instances world markets demand produce, so farmers try to meet those markets. And sometimes, there will be land that's cleared that should not have been, or grazed when it shouldn't have been. All these place great pressures on soil resources."

He warned that increased competition over depleted resources would lead to conflict - "and the losers will inevitably be the environment and poor people".

According to the UN's food and agriculture programme, 854 million people do not have sufficient food for an active and healthy life.

The global population has risen substantially in recent decades. Between 1980 and 2000 it rose from 4.4bn to 6.1bn and food production increased 50%. By 2050 the population is expected to reach 9bn.

The threat of a food crisis is exacerbated by fears over energy security, with many countries opting to plant biofuel crops in place of traditional food crops. India, for example, has pledged to meet 10% of its vehicle fuel needs with biofuels.

Andres Arnalds, of the Icelandic soil conservation service, said the pressures on food production would have knock-on effects all over the world because of the international links in food supply.

Mr Campbell said: "If we can improve agricultural practices across the board we can dramatically increase our food production from existing lands, without having to clear more or put more pressure on soils. Simple things like good crop rotation, sowing at the right time of year, basic weed control, are what is needed. They're very well known but not always used."

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