

‘Climate change impacts food and nutritional security — Earth needs regenerative farming’

Pamela D. McElwee teaches human ecology at Rutgers University. Speaking to Srijana Mitra Das at Times Evoke, she outlines why climate change is a major threat to food production globally — and vital steps to mitigate this:

What is the core of your research and what is human ecology?

The field of human ecology studies how humans and the environment work together or against each other. It takes an integrated approach to human-environment interactions. My research explores how environmental change impacts human vulnerabilities. This encompasses how climate change and biodiversity loss impact people's ability to be resilient to disasters and make a livelihood. Different kinds of environmental change increase our vulnerability — I study the dimensions of this.



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Does climate change impact food production and nutrition?

It has very significant impacts on these. I was part of a 2019 IPCC panel on climate change with a special report on land. The findings showed how climate change was already impacting multiple dimensions of the food system. Climate change impacts the biophysical conditions in which crops grow. Some crops are less heat resistant — as the atmosphere grows warmer, these become less productive. We're already seeing declines in the



TIME TO GET AGRO: Agroforestry, or growing crops alongside trees, as done in southeast Asia, is a highly regenerative practice



Pictures Courtesy: P McElwee

AS THE THREAT RISES: Ecological challenges from deforestation to soil desertification and biodiversity loss are now impacting agriculture globally. The key lies in sustainable farming as practised by indigenous communities across Vietnam, etc.

productivity of staples like wheat and the US are vulnerable. In the US, we're likely to see shifts of agriculture from the mid-West to the Northern

Great Plains and Canada because heat and drought are predicted to rise significantly. The loss of crop productivity in the mid-West necessitates shifting to other locations. This will be true of every agricultural country.

Which countries are most vulnerable to such impacts?

Any country that has a significant agricultural sector is likely to experience these. Major agricultural producers like India

and the US are vulnerable. In the US, we're likely to see shifts of agriculture from the mid-West to the Northern

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Are particular crops more vulnerable to climate change?

As an example, rice is often grown in southeast Asia quite close to coastlines where there is saline water. Rice doesn't really flourish in salty water but, as sea levels rise, the band of saline water is growing further inland in countries like Vietnam. This is making it increasingly difficult

NUMBER OF OVERLAPPING LAND CHALLENGES



to grow rice in these regions. Overall, we will see significant climate impacts on all crops and farming communities. We're seeing this in wealthier countries already — the US saw significant flooding in spring 2019, in the mid-West's corn and wheat-growing belt. Many farmers had their crops wiped out while others were delayed in planting and lost the growing season. Farmers suffered considerable losses.

But remarkably, farmers practising regenerative agriculture, who had been using cover

crops between seasons — they might grow wheat but have a different cover crop over winter to protect the soil — were less affected. We therefore need to approach agriculture in a far more sustainable way to build resilience to climate change.

How would you define such sustainable farming?

The prevailing mode in the globalised food system has been based on productivity or ways to grow the most crop and sell it to a huge market. Agricultural trade must be balanced with more sustainable practices for managing soil and water. One good way is to use different varieties of crops that are more resilient, including wild species and traditional cultivars, many being extremely hardy against droughts, floods, etc. We need to move away from some of the very highly engineered crops that dominate our monocultural globalised food system and adopt more regional, soil-conserving, resilient crops.

Around the world, many communities practise sustainable farming based on indigenous knowledge of local conditions. Such farms follow intercropping or growing different crops together or agroforestry, growing green crops with tree crops — these practices might not have the global food system's high productivity but they are very sustainable in the long term.

Can sustainable agriculture feed a growing global population?

There are important facts to consider here. Essentially, we now produce enough food to feed everyone — if there are still people with inadequate access to food, this is because we are not distributing it properly. We also

FOOD FOR THOUGHT

8.9% of the world lives in hunger — this number has grown to 690 million people over the last five years

To feed a growing global population, food production must increase by 56%-60% by 2050 — but agriculture now absorbs 63% impact from climate disasters

76% of the world gets most daily nutrition from plants — but exposed to CO₂ levels predicted for 2050, scientists find wheat, corn, rice and soy could lose 10% zinc, 5% iron and 8% protein, causing major nutrition deficits

IPCC global warming scenarios show coarse grains, oil seeds, wheat and rice — 70% global crop harvested area — suffering a 17% yield reduction by 2050

Experts find enduring solutions in regenerative and organic farming modes

Research: World Bank, World Economic Forum, Food and Agriculture Organization (FAO)

must stop food waste — a quarter of food produced globally is wasted either at the farm gate, when farmers can't market crops in time, or at the consumer end when people buy too much and it goes bad. If we could save that 25%, we'd be able to significantly boost global food access.

Also, a lot of grain production in the global North doesn't feed humans — it feeds livestock. If the over-consumption of meat in industrialised nations would reduce, that would free up grain to give to human beings. Climate change touches everything, from economics to livelihoods to our social fabric. We could prevent its worst impacts by taking action globally — food security is the most important place to start.