Study: Climate change makes our food more poisonous

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Extreme weather is increasing toxins in our food - which can be fatal. As temperatures keep rising, it seems the problem will only get worse. DW interviews a chief scientist at UNEP.

Extreme weather is increasing the levels of toxins in our food, according to a new report by the United Nations Environment Programme (UNEP).

With global temperatures set to rise by more 3 degrees Celsius, scientists warn the problem will only get worse. DW spoke with UNEP chief scientist Jacqueline McGlade out of Nairobi.

Deutsche Welle: What were the main findings of the report?
Jacqueline McGlade: The United Nations "Environment Frontiers Report" this year identifies emerging issues that include what we call the "poison chalice": toxin accumulation in crops in response to climate change.
One of the major findings is that as nature forces plants to adapt to drought or flood conditions, they turn on - or accumulate - different toxins that make them unpalatable or even poisonous to people and livestock.

How exactly does extreme weather increase the levels of toxins in our food?
Jacqueline McGlade says farmers must pay attention to early signals that toxins may be present in crops.

Under normal growing conditions, plants really do produce a whole range of proteins and all kinds of beneficial nutrients. But when we have extreme weather such as drought conditions or floods, it makes the plant respond in different ways. Crops such as barley, maize or millet - the big crops that we would know all over the world - start to slow down, or even prevent, the conversion of certain chemicals. Nitrate is one of them. When it accumulates in the plant itself, and then we consume it, or animals consume it, that acute nitrate level causes poisoning. There's another chemical which sounds very dangerous, "prussic acid" or hydrogen cyanide. That's the one that we're most concerned about. It can accumulate in cassava, flax, maize, sorghum - many of the things that people in the poorer part of the world rely on.

And at the other extreme, in more damp and flooding conditions you see fungal growth. We've seen burning of large amounts of stored maize and seeds in towns and cities in East Africa, because fungi spread and you can see them - they're like a black mold sitting the seeds themselves. Of course, if that's not picked up and it's put into the milling, it goes in the flour, which means it makes its way into the bread that we eat.

*What are the dangers of toxic crops?*

They can cause nervous disorders. They can really make it difficult for people to breathe - it's like asphyxiation [suffocation]. If animals or human beings are pregnant, that can cause miscarriage.
Drought can increase levels of toxins in crops - and subsistence farmers are particularly at risk.

There’s a lot of evidence that acute exposure particularly to aflatoxins - these fungal toxins - but also prussic acid, can be lethal. And we have many instances here, certainly in East Africa, where that has occurred.

We’re also worried there’s an exposure issue - which means if you continue to have access and eat the crops that are contaminated, it can lead to cancer, it can stunt fetal growth, infant growth, it suppresses immunity. There’s a whole raft of things in the population at large when they’re exposed to these.

Nitrate is another case altogether can it can be seen to affect very, very quickly the human condition through neurological collapse, so it’s very dramatic when people are exposed to nitrate poisoning.

*Which parts of the world are already seeing these toxins accumulate in crops?*

We can look at a map of the world of drought conditions and you can pretty much guarantee that somewhere in those areas you going to find it. So in sub-Saharan Africa, but increasingly in northern and southern parts of Africa. We see definite trends in Latin America and Brazil.

Really, all over the world now. The difference when you’re in the developing world is it’s very difficult to find the institutions to detect those toxins. They are occurring in Europe, they are occurring in North America, but there, the industry itself is able to have early warning and detection systems.

*Who is this actually affecting?*

The poorest farmers - subsistence farmers, and certainly those who are very tied to one crop. And what is even sadder, is that in areas such as Kenya and eastern Africa, there
are other plants which people who are not even farmers rely on for daily subsistence. Plants from the edge of the road - cowpea is an example. These are not major crops, people rely on them to survive, and these same plants are also showing the same accumulation of toxins.

If crops haven’t been washed away by a flood, fungal toxins can thrive in the damp conditions, posing a hidden health risk

*Should we as consumers be worried?*

We think probably about 4.5 billion people in developing countries are already exposed to this uncontrolled and unmonitored amounts of aflatoxins [fungal toxins]. We do need to be vigilant, we need to be aware that the food chain has to be protected. As consumers it’s important that we are aware of and put pressure on the food chain suppliers.

*And with global temperatures set to rise by more than 3 degrees Celsius, is the problem likely to get worse?*

Absolutely. Here the consequences for human health need to be put at the forefront. Of course we need to grow crops - and here is where the industry needs to work with farmers to try to find drought-resistant forms that do not accumulate the different aspects of nitrates and prussic acid. Similarly, resistant forms to different kinds of mycotoxins - these fungi that spread.

As we look forward and see the effects of climate change, we can really start to see the upper end of this: 70 percent of agriculture production is going to be affected by either too much rain or too little rain. So we need to be aware: this exposes potentially billions to toxins.
Jacqueline McGlade is chief scientist of UNEP’s Division of Early Warning and Assessment.

Interview: Charlotta Lomas