Climate change ‘early warning system’ vital to global food security

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In the midst of a global food crisis, leading scientists are calling for the development of a botanical ‘early warning system’ to secure the future of the world’s plants in our new, uncertain climate.

From wheat and rice to apples and rhubarb, a vast array of the world’s most important crop plants are under imminent threat due to climate change, warns leading plant conservation organisation, Botanic Gardens Conservation International (BGCI). Widely seen as a key driver of the current global food crisis, unseasonably mild winters and extended summer droughts have taken their toll on the ability of such plants to bare normal harvests world wide.

To address this global threat to plants, a radical ‘early warning system’ is being proposed by scientists at BGCI to provide conservationists around the world with detailed information on how to help plants and even whole ecosystems to adapt to the planet’s increasingly uncertain climate.

“Plants form the basis of every major terrestrial ecosystem on our planet, but despite the key importance to all life, we currently have an extremely limited understanding of how they will be affected by climate change” says Belinda Hawkins of BGCI, one of the authors of a ground-breaking report on the subject. “What we do know is that this new climatic era will have its ‘winner’ and ‘loser’ species, and unfortunately many of humankind’s most valued crops, medicinal and ornamental plants are likely to fall into the latter category.”

Already species which require a distinct cool season and significant frosts, such as blackcurrants and brussels sprouts, have seen reduced harvest levels – which in turn has been reflected in spiralling market prices for their products. The current surge in prices for basic foodstuffs, which is having a crippling effect on many in the developing world, has been demonstrated to be induced, at least in part, by climate change - with wheat harvests in much of the world severely affected by droughts.

But it is not just crop plants that are already feeling the effects of global changes in climate, a host of wild plants vital to human wellbeing are also under imminent threat due to increasingly rapid changes in their environment. “From vital medicinal plants that may hold the answers to many of the world’s major diseases, to entire forests that are vital to mitigating the effects of human-induced carbon emissions, plants that are fundamental to human survival are under threat.” said Ms. Hawkins.

Although there is consensus amongst botanists that radical actions will need to be taken to help plants, and particularly crop species, to adapt to an increasingly uncertain climate, the scientific community is only beginning to understand how this should be done. What makes this situation particularly concerning is that the time taken to adapt agricultural and plant conservation practices is often slower than the

rate of climate change. “On average the development of a new blackcurrant variety, which is better adapted to warmer climate, takes about 16 years.” says Hawkins. “The problem is that this time-delay may often be too late given the current pace of climate change.”

The solution proposed by BGCI is a groundbreaking international scientific effort to record and collate data on how plants around the world are currently affected by climate change, in order to predict the likely future effects of such changes on global plant populations. Such a project would not only to accurately identify which species and geographic areas are most likely to be affected, but also be invaluable in planning how best to adapt current agricultural and horticultural practices to conserve these species and adapt to changing local climates. BGCI plans to galvanise the combined talents of its membership of more than 600 botanic gardens around the world in this global effort. “By working with members, which exist in more than 120 countries, we can start to identify how our changing climate is starting to effect the growth and distribution of our most threatened and useful plants”, says, Suzanne Sharrock, Global Programmes Director at the international NGO.

The early warning system could be used by agronomists, for example, to identify species that are most likely to be suited in areas most affected by climate change – decisions that are vital to food security across large regions of the world. By identifying wild plant populations that are most likely to be affected by climate change, scientists can far more effectively target conservation efforts, projects that may result in the saving of the next most important medicinal drug, or a species that holds the key to breeding improved food crops. “We are working to secure the funding that would be required to develop the system”, says Sharrock. "With the systems in place, ensuring a future for the Earth's plants will be possible."

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