Denise Bester: Setting rules for living on planet earth

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For more than 10,000 years the Earth has been in a relatively stable state - a unique period called the Holocene, which has allowed civilisations to evolve.

This desirable state is now under pressure from what scientists say is largely human-driven change.

The question is: how far can we go before our actions cause disastrous consequences, or is it already too late?

With this question in mind, a group of 28 of the world's leading scientists, led by Johan Rockstrom at the Stockholm Resilience Institute, have joined forces to determine which planetary systems are critical to sustaining human life, and the "tipping points" for each.

What they've come up with is being hailed as a new approach to sustainable development.

Called "planetary boundaries", it aims to look at how humanity's actions are stressing the entire Earth system and develop a "safe operating space" for human life, rather than imposing "limits to growth".

The research group has identified nine key systems and proposed preliminary sustainable threshold levels for the following seven: climate change, ocean acidification, stratospheric ozone depletion, freshwater use, biodiversity, global nitrogen and phosphorus cycles, and land-use change.

If the thresholds are surpassed, they say, we are at high risk of experiencing catastrophic effects.

They have not yet been able to find safe limits for two other systems: atmospheric aerosol loading and chemical pollution.

The researchers say we have already crossed the boundaries for the nitrogen cycle, the rate of species loss, and human-induced climate change.

Professor Rockstrom says that to continue to live and operate in a "safe space", we need to stay away from the threshold points and, where we have already overstepped them, backpedal as a matter of urgency.

While each system's boundaries are difficult to identify, they are all very strongly linked, and therefore transgressing any of them can have unpredictable impacts on some or all of the others, placing them at risk of being surpassed, too.

Once the interactions become more fully understood, Professor Rockstrom says, the boundaries for human activity are likely to become smaller than currently predicted.

This new system has its critics, of course. While globally we may be well within a particular threshold, local circumstances are often unique and these thresholds may be reached far sooner, causing small-scale destruction.

Furthermore, while this type of framework is desperately needed by policy-makers, there is some debate over whether the use of thresholds may provide just another excuse to delay positive action, as we wait for the limits to be reached.

While by no means definitive, this new approach may indeed prove very useful in protecting life as we know it, and by linking back to ecosystem services, it strongly reinforces just how dependent we are on nature.

One of the 28 scientists, Professor Jonathan Foley, says: "This isn't about hugging trees and hoping they stay here, this is about keeping the planet we know intact for future generations".

*** Denise Bester is from the sustainable living website www.ecobob.co.nz**