Ecosystem services – the natural processes that allow Earth to sustain life and provide us with everything we have and see – are facing an uncertain future.

Between 1997 and 2011, the global value of ecosystem services declined by up to US$20 trillion per year as a result of changing land use. To put that in context, the world's entire GDP is currently just under US$74 trillion.

Our research shows that, in the Asia-Pacific region, this downward trend is likely to continue unless there are significant policy changes. By 2050, we predict that ecosystem service values could drop by 34% from their 2011 base value of US$13 trillion.

But, more optimistically, we also forecast that ecosystems could grow in value by 24% by mid-century, if policies are put in place to safeguard these crucial environmental values.

An Asian century (of ecosystems)

The Asia-Pacific region has historically followed the global trend in ecosystem depletion. But the future doesn't have to be like the past. The decisions we make as a society will determine what our world will look like in that future.

With that in mind, our research focused on a range of land-use scenarios to try to forecast the consequences of various social, environmental and economic policies.

We used these scenarios to derive estimates of land-use change (urban, cropland, forest, grassland, wetland, desert), population, GDP and other variables such as inequality up to the year 2050. Changes in total value of ecosystem services in these scenarios were estimated to be due to two factors: the change in area covered by each ecosystem type; and the change in the "unit value" – the total value of all the marketed and non-marketed ecosystem services, per area, per year of each ecosystem type due to degradation or restoration.

In the Asia-Pacific region, Afghanistan shows the greatest potential losses and gains, as do other countries that are more susceptible to desertification. At the same time, these countries also have the greatest potential for reversing land degradation.

On the other hand, in this region, countries like Japan and New Zealand have the least potential for fluctuations in their ecosystem service values. This is because they are already highly developed and potentially have more stable climates.

Australia's prospects

Australia, second only to China in ecosystem services value, also shows an extensive range of values among our four scenarios. Starting with a terrestrial ecosystem services value of US$3.4 trillion per year in 2011 (roughly three times Australia’s GDP that year), we forecast that by 2050 ecosystem services could grow in value by as much as 21%, or decrease by up to 29%.

This translates to either a gain of US$700 billion per year or a loss of US$980 billion per year – a figure that's not far short of Australia's current annual GDP .

The scenarios used incorporate a range of world views and policies, and the impacts of these on the entire, integrated system, including population, energy use, equity, environmental change, climate change and more. Our research features a country-by-country breakdown of the outcomes of each scenario, although it is impossible to separate out the impact of individual policies, especially given the differences in each country.

The consequences and solutions

The loss of ecosystem services will be felt most strongly by the poorest in any society, as they depend most directly on ecosystem services. They are the first to feel the effects when those services begin to disappear, and the least able to replace or ameliorate the loss. Increasing ecosystem services, on the other hand, would increase sustainable human well-being .

Around the world, the focus on ecosystem services has been growing quickly. Recent major policy reforms in this direction include a White House memo directing US federal agencies to incorporate ecosystem services into their planning, investment and regulations.

Other countries have also begun to incorporate ecosystem services in their policies. The European Union has mandated all member countries to produce national ecosystem service assessments, for use in policy and decision-making.

At the international level, the United Nations has set up an Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, analogous in structure and function to the Intergovernmental Panel on Climate Change. The international Ecosystem Services Partnership has also been established to co-ordinate and facilitate the exchange of information and expertise across the world.

We have taken ecosystem services for granted for far too long. The UN Sustainable Development Goals, adopted last year by all UN countries, include specific calls to promote sustainable use of terrestrial ecosystems, to halt and reverse land degradation, to ensure clean water and food security, as well as to safeguard life both on land and in the oceans.

If we are taking these goals seriously, we need to put natural capital and ecosystem services "on the books" as a major contributor to sustainable well-being.

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