

Commentary

IPCC Land report

Guy F Midgley 

Department of Botany and Zoology, Stellenbosch University, South Africa

<https://doi.org/10.17159/caj/2019/29/2.7701>

The IPCC produced its seminal report “People, land and climate in a warming world” earlier this year. It is the first such report developed by all three of the IPCC working groups working together (WG1 on climate change science, WG2 on impacts and adaptation, and WG3 on mitigation), and included direct collaboration with the task force on National Greenhouse Gas Inventories (TFI). It was also the first IPCC report to have a majority of developing country scientists in its authorship list. Clearly then, this report marks an effort by the IPCC to represent a broad range of scientific and applied perspectives to the issue of how land, and its management, could play a role in the climate system, in reducing vulnerabilities of human society to climate change, and in helping to mitigate climate change through understanding and managing emissions from land use and land management.

The seven chapters of the report comprise, after a chapter on framing and context, Land-climate interactions, Desertification, Land degradation, Food security as four basic building blocks, and then two chapters looking at interlinkages and between these building blocks, and finally risk management and decision making. The Summary for Policy Makers (SPM) cuts across these topics cleverly, covering four main areas in developing overall take-home messages from what is an extremely comprehensive report. These four areas are People, land and climate in a warming world, Adaptation and mitigation response options, Enabling response options, and Action in the near-term.

The SPM presents the case that human society already consumes somewhere between a quarter to a third of the potential net primary production from the land surface for food, fibre, timber and energy. This estimate has been in the literature for some time now, but the report constrains the estimate well. Furthermore, the report presents how rapidly human demand for resources from the land surface are ramping up, both due to population growth and increasing wealth and buying power, while almost an eight of the world's population remains undernourished. The result has been degradation of about a quarter of the earth's land surface, with soil erosion rate exceeding soil formation rate by 20 to 100 times. Climate change is exacerbating this trend, and people living in degraded and desertified areas are particularly badly affected. While the land surface has helped to sequester around 6 GtCO₂ per annum of anthropogenic emissions, projections suggest that climate change could weaken this sink. The report highlights a number of implications for food supply and food security, with risks escalating unequally in different parts of the world.

There is good news, as well, and this relates especially to how efforts to combat desertification, degradation and the decline of food security can also serve to increase our ability to adapt to and mitigate climate change. Several response options are considered in the report, and include sustainable food production, improved and sustainable forest management, soil organic carbon management, ecosystem conservation and land restoration,

reduced deforestation and forest degradation, and reduced food loss and waste. However, these responses are effective over very different timelines, leading to a need to prioritise in their implementation. Conservation of high carbon ecosystems would be immediately effective, but less immediate responses include reforestation and afforestation, and ecosystem restoration, including the reclamation of systems with degraded soils.

While these responses all play a role in helping society to adapt to and mitigate climate change, their effectiveness has a definite ceiling, as they sink for carbon fill up in most ecosystems, save a few such as peatlands that may sequester carbon for centuries. Afforestation of so-called “degraded” ecosystems is a bone of contention in southern Africa, and indeed in many subtropical regions, where species rich grasslands can be characterised as anthropogenic, and thus degraded. Policy makers in the global south need to be aware of this issue before signing onto afforestation schemes that could be ruinous for local people and their livelihoods. Another issue is the species chosen for afforestation programs, with a long history of inadequately assessed introductions of invasive species a clear warning to those who would restore forests with exotic tree species. The report finds that if deployed at appreciable scales for carbon sequestration, afforestation, biochar production and biomass based fuel production, these efforts could greatly increase demand for new land conversion, and should thus usefully be limited in scale.

Some apparently low hanging fruit for carbon management are to be found in improved management options, which require neither any further land use change nor more demand for land conversion and land cover change. However, an increasing awareness of dietary choices which are prompted by non-sustainable meat production may affect markets for meat even if it is produced sustainably, a potentially adverse outcome that policy makers in the global south should be vigilant about.

As we currently understand it, options that limit global warming to 1.5C include more land-based mitigation than do higher warming pathways. In other words, land is crucial for achieving this low warming outcome, and the results projected include that direct climate change impacts on land systems would be less severe. The report finds that delaying action on climate change mitigation and adaptation responses across sectors would cause increasingly adverse impacts on terrestrial ecosystems and food production. Ironically, delayed action also increases the demand for widespread land-based mitigation responses, which could limit their future effectiveness. This is the policy equivalent of human society painting itself into a corner. Indeed, the outcomes of this would include irreversible impacts on some ecosystems, and even the acceleration of emissions from some high-carbon ecosystems such as high latitude peatlands, which would in turn exacerbate anthropogenic warming. Such a fate is clearly something we would want to avoid.