

Nature-based solutions: The missing ingredient in climate adaptation?

July 1 2019, by Pushpam Kumar



Nature-based solutions, like this restored prairie ecosystem in Oregon, can address climate change and other social, economic, and environmental challenges at the same time. Credit: [Wikimedia Commons](#)

The upcoming United Nations Climate Action Summit in September 2019 will attempt to bring about transformative change and resounding actions to accelerate climate solutions aligned with the 2030 Agenda for Sustainable Development. Of the summit's six action areas, the concept of nature-based solutions has caught the imagination of conservation supporters and development practitioners alike.

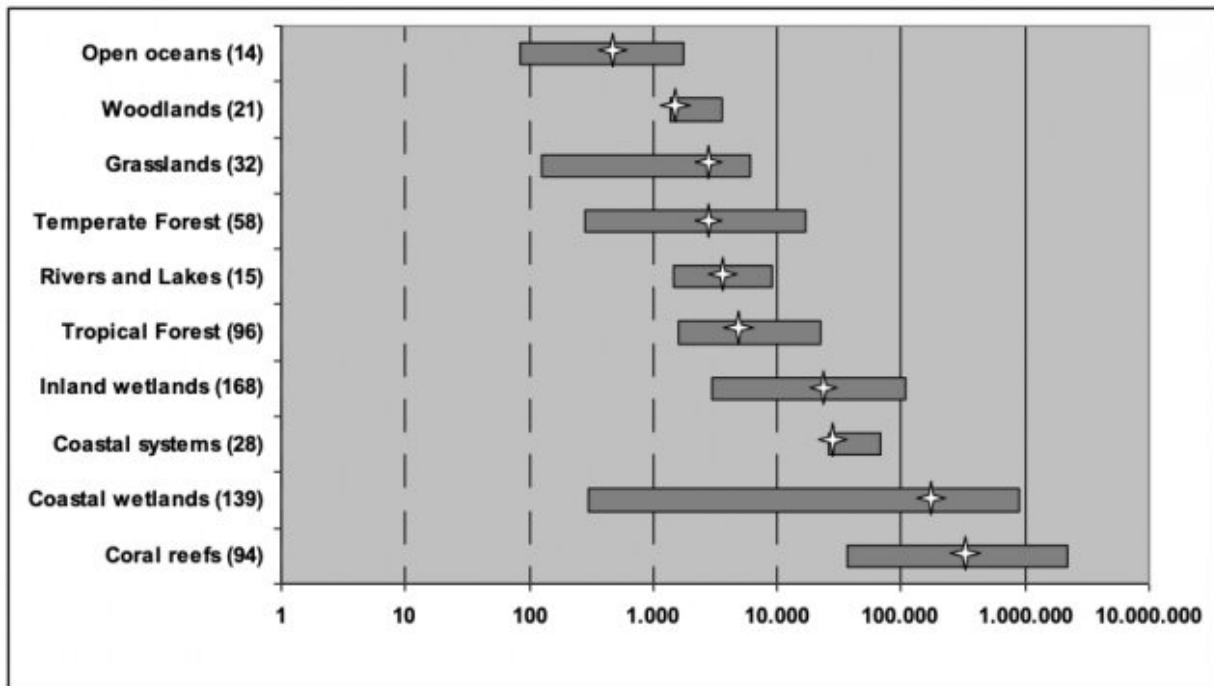
Nature-based solutions involve actions that work with and enhance nature so as to help people adapt to [climate change](#) and disasters. Nature-based solutions can help make countries more resilient to the adverse impacts of climate change and significantly reduce greenhouse gas emissions, including emissions from deforestation and forest degradation, while also benefiting human well-being and biodiversity. These solutions can range from simply protecting [natural areas](#) to increasing the genetic diversity of trees to increase forest resilience, all the way to planting new ecosystems to make cities greener and clean up polluted areas.

While it's only one of many strategies for adapting to climate change, I argue that restoring ecosystems should be given due consideration on the international stage of climate action and could be a game-changer in [climate adaptation](#).

Climate change adaptation and the restoration of natural capital

While climate change mitigation (that is, the effort to reduce emissions) has received much attention and support, climate change adaptation has thus far been less of a priority. One reason for this discrepancy may be that the benefits of adaptation are much harder to quantify than the costs. The most common approach to estimating the benefits of adaptation is to calculate the avoided damage costs. For example,

suppose there is a flood-prone area that requires an elevated and strengthened bridge. The timing, severity, and extent of damage that will be caused by an extreme flood event is unknown at the time the decision must be made as to whether or not to invest in adapting the bridge. This necessitates focusing on investing in projects that have other benefits as well. In other words, a shrewd adaptation policy is one that renders benefits irrespective of whether or not there is a trigger event. In so doing, the ongoing benefits could "pay" for the adaptation measures.



Total monetary value (average and range in dollars per hectare per year) of ecosystem goods and services per ecosystem type. Credit: De Groot et al. 2012

One such adaptation option is restoring [natural capital](#), the benefits of which do not require an adverse climate change or extreme weather impact to yield benefits. Natural capital—which includes living species,

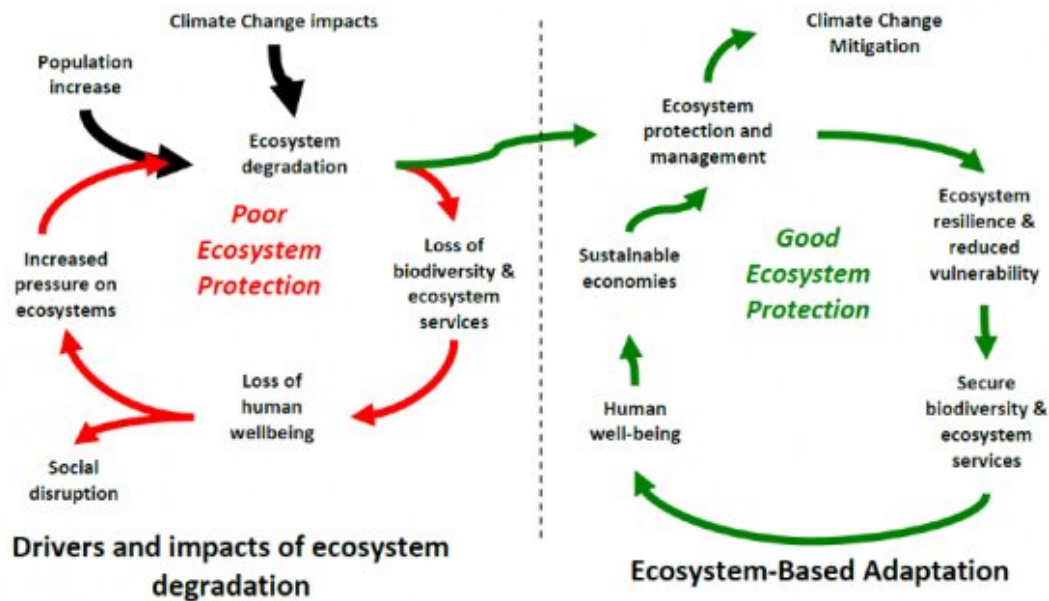
non-living resources such as water and air, and cultivated assets such as crops and forest plantations —delivers a suite of ecosystem goods and services upon which humankind depends for survival and economic activity. Ecosystem services can include food, timber, water filtration, and more. As a crude generalization, the better the stock of the asset in terms of quality and quantity, the better and more ecosystem services can be derived from it, and vice versa.

As an adaption strategy, restoring natural capital reduces people's vulnerability to climate change by reducing losses of ecosystem goods and services, insuring against future disasters, and safeguarding the genetic bank of biological material (such as seeds) for future use. In addition, restoration of natural capital can enhance [carbon sequestration](#) and therefore contribute meaningfully to climate change mitigation.

For example, restoring mangrove habitat provides multiple benefits such as:

1. Moderating the impacts of waves and wind on coastal settlements, thereby increasing resilience to natural disasters;
2. Mitigating climate change through increased carbon sequestration;
3. Providing ecosystem services, such as breeding grounds for fish species, that directly benefit people and biodiversity.
4. The Value of Restoring Natural Capital

A 2012 global assessment of over 200 studies estimated that the annual value of ecosystem goods and services provided by intact natural capital ranges from as little as \$100 per hectare in open oceans to more than \$1,000,000/ha in coral reefs. The bulk of the values fall between \$1,000 and \$100,000/ha/year.



Migrating from a vicious cycle of poverty, ecosystem degradation and climate change to a virtuous one. Credit: Pushpam Kumar

These values show the contributions intact ecosystems make to supporting human well-being and livelihoods. It is these values that are seriously compromised as ecosystems degrade. Not only does degradation compromise the inherent integrity of ecosystems, thereby making them more vulnerable to collapse or irreversible change over time, it also compromises human well-being through the loss of the services rendered by ecosystems.

Thus, restoring natural capital has the unparalleled benefit of contributing meaningfully to human well-being and climate change adaptation, by ensuring or augmenting the delivery of ecosystem goods and services and buffering against the impacts of severe climatological events such as droughts and floods.

Ecosystem restoration also contributes to climate change mitigation by increasing the capture and long-term storage of carbon. The degree to which restoring natural capital may enhance carbon sequestration depends on multiple factors, including the size of the restoration project, the ecosystem and climatic zone in which the project operates, and the type of restoration work conducted.

The rate of carbon sequestration (under conditions of restoration) typically follows an S-shaped curve with a slow rise followed by an acceleration before flattening off as the system is restored and/or reaches a steady state. While there is a debate as to the amount of carbon that is sequestered in any ecosystem, most studies use the very conservative Intergovernmental Panel on Climate Change (IPCC) guidelines to estimate the amount of carbon that restored [ecosystems](#) will be able to sequester.

Given the links between climate change adaptation, nature-based solutions, and natural capital, it is adaptation, rather than mitigation, that potentially has the greatest to offer with respect to supporting human well-being and [sustainable development](#). Thus, I offer the following observations and recommendations:

1. Restoring degraded natural capital can contribute meaningfully to both [climate change mitigation](#) and adaptation while supporting human development and progress towards achieving the [Sustainable Development Goals 1,2,3,6,7,13,14 and 15](#).
2. Climate change adaptation measures are often good social and economic By considering adaptation and socio-economic development as potential joint outcomes of a single investment stream, there is the likely benefit of addressing multiple societal ills beyond the SDGs mentioned above;
3. Nature-based solutions will render benefits irrespective whether or not the [climate](#) change impacts and/or extreme events are

realized. This is imperative given the scarcity of resources and conflicting choices.

4. Policymakers might be pressured to consider only those interventions that offer immediate, quantifiable benefits. Interventions that are risky and/or for which the benefits are uncertain are unlikely to gain much traction or secure investments. However, investments in interventions that render both immediate and long-term adaptation benefits while contributing to socio-economic development—such as nature-based solutions—should be considered extremely favorable among the adaptation and investment options available to stakeholder groups.
5. Quantified and credible estimates of the benefits of nature-based solutions must be encouraged to clear the haziness in decision and application.

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