factsheet

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Key research findings

Forests and climate change adaptation

What policymakers should know

- **Forests facilitate adaptation:** Managing standing forests better, and expanding tree cover through socially- and environmentally-responsible reforestation and restoration, helps deliver a range of livelihood and environmental benefits that assist both people and ecosystems adapt to climate change.[1] The benefits include, but are not limited to, the points listed below.

- **Safety nets:** Forests are important safety nets for communities, helping them cope with climate shocks. Many forest products are more resilient to climate variability and extremes than crops, and so are crucial to the resilience of local livelihoods. If crops fail due to drought[2] or assets are lost because of floods,[3] communities can sell forest and tree products – timber, fuelwood and non-timber forest products (NTFPs) – for income. They can also consume products – such as mushrooms, sago, fruits and bushmeat – as food. In addition, fodder from trees can help ensure the survival of livestock for months at a time if drought strikes.[4]

- **Agriculture:** Trees on farms protect the soil and regulate water and microclimate, and help protect crops and livestock from climate variability. Crops grown in agroforestry systems are more resilient to drought, excess precipitation, and temperature fluctuations and extremes.[5] Research in Africa, for example, shows that leguminous trees can make agriculture more drought resilient by improving water infiltration and increasing productivity through nitrogen fixation.[6]

- **Watersheds:** Forests contribute to regulating river flows – base flows during dry seasons and peak flows during rainfall events – minimising risks related to water scarcity and floods.[7] In Flores, Indonesia, for example, tropical forested watersheds have been shown to increase base flows and reduce the impacts of drought on downstream agrarian communities.[8]

- **Coasts:** Coastal forests such as mangroves help reduce risks from disasters relating to climate extremes (storms or cyclones) and sea-level rise (coastal flooding). Research in India[9] and Vietnam[10] has shown that coastal settlements with mangroves in close proximity suffer less damage from such events than those without.

- **Cities:** Urban forests and trees provide green infrastructure – shade, evaporative cooling, and rainwater interception, storage and infiltration – in cities. They can play a significant role in urban adaptation to climate variability and change[11] by reducing temperatures during heat waves.

- **Regional climate:** Tropical forests influence precipitation and can have a cooling effect on a region through increased evaporation and cloud cover.[12] This can occur over large distances: for example, land use change in the humid tropics can influence precipitation in the middle and higher latitudes.[13]

- **National Adaptation Programmes of Action (NAPAs):** The critical role of forests and trees is already recognised in projects on human adaptation, several of which are being proposed in NAPAs. Some examples include the conservation or rehabilitation of mangroves to protect vulnerable communities in coastal areas of Bangladesh and Cambodia, and for regulating water flows and providing fuel wood to local communities in Benin.[14] Forest and tree services can also support and increase the effectiveness of technical or infrastructural adaptation measures, while providing co-benefits for livelihoods, biodiversity and climate change mitigation.

Notes

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13 Pielke Sr., R. 2002 Overlooked issues in the US national climate and IPCC assessments. Climatic Change, 52: 1-11.

14 Pramova, E., Locatelli, B., Brockhaus, M. and Fohlmeister, S. 2012 Ecosystem services in the National Adaptation Programmes of Action. Climate Policy, 12(4): 393-409.

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