Ecosystems opportunities to reduce hazard exposure

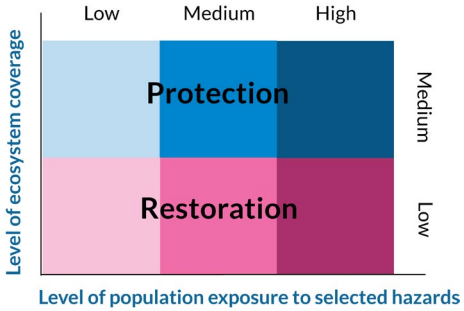
The first global maps to identify suitable ecosystem areas for reducing disaster risks

Why are ecosystems important for disaster risk reduction?

Disaster risks, fueled by climate change impacts, are one of the most pervasive and threatening issues of our time, with far-reaching impacts in the 21st century. Urbanization and greater expansion of human settlements in hazard-prone areas are increasing disaster risks to dangerous levels.

Historically, disaster risk reduction measures focused massively on grey infrastructure, such as dykes, sea walls or gabions.

The 2004 Indian Ocean tsunami raised awareness about the role of mangroves in protecting entire communities and their livelihoods from the waves.

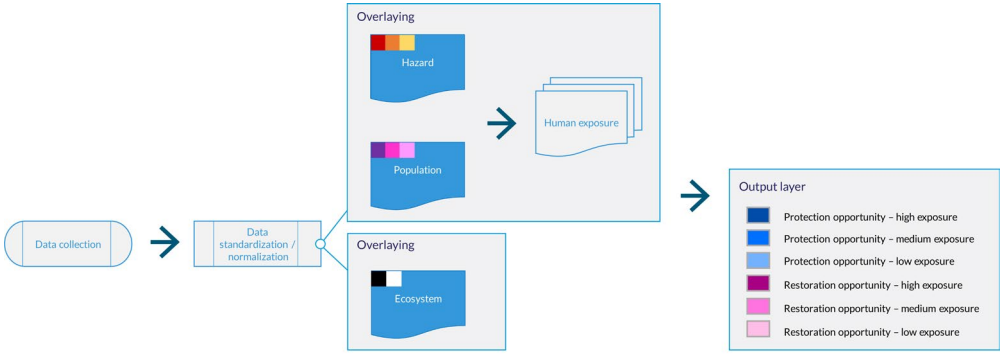


Ecosystems in general are increasingly recognized for their role in reducing disaster risk and the harmful impacts of climate change. Mangroves, sea grasses and corals have been proven to reduce wave energy and related impacts from storm surges; forests and other vegetation can reduce landslide susceptibility by removing excessive soil water content and stabilizing the soil through root networks; forests can also buffer drought by regulating humidity and increasing precipitations, through albedo, roughness, shadow, heat absorption and evapotranspiration processes.

While regional assessments have been conducted, there has been no cross mapping of ecosystem distributions and human exposure to hazards at a global scale. The availability of global datasets provides an opportunity to visually compare the restoration and conservation potential of various ecosystems to population exposure to hazards to find opportunity areas where ecosystem management can be used to protect the greatest number of people globally.

How does this geospatial tool work?

By overlaying global datasets on ecosystem distribution and hazard exposure, this tool highlights restoration and protection opportunities areas. In areas where the ecosystem coverage is low – because it has been depleted, degraded or damaged - and the population is exposed to certain hazards, ecosystem restoration can provide an opportunity to reduce disaster risk. In areas where the ecosystem coverage is high and the population is exposed to certain hazards, ecosystem protection, for example through the establishment of protected areas, can further reduce disaster risk, by ensuring that ecosystems stay healthy and can provide multiple services.



How can it contribute to improving disaster risk reduction efforts?

By raising awareness of the potential of ecosystem-based solutions for disaster risk reduction, this tool can catalyze increased investments in Green Infrastructure (i.e. coral reefs, coastal forests, protection forests on steep slopes). In particular, this Opportunity Mapping tool can be tailored to assist Member States in reporting on Green Infrastructure as mentioned in the Sendai Monitor with regards to Critical Infrastructure (Targets C and D). This feature is something that could be programmed if there is sufficient interest by Member States and included in National Disaster Risk Reduction Strategies.

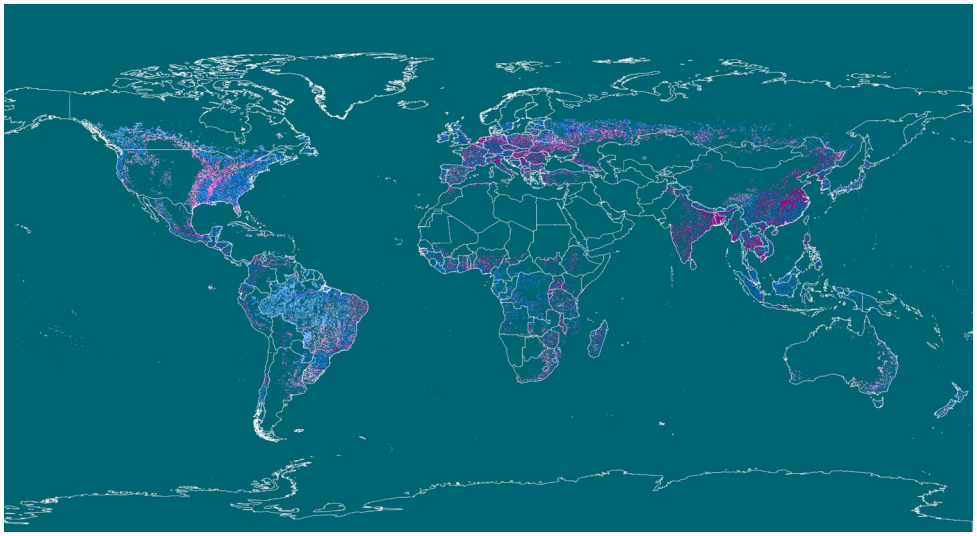
In addition, this tool can provide a first screening for large scale ecosystem restoration and protection initiatives for disaster risk reduction, such as initiatives that will be implemented by the UN Decade on Ecosystem Restoration (2021-2030).

To find the datasets and our interactive presentation: https://app.mapx.org/?project=ecosystems4risks

Global map: forest opportunities to reduce flood exposure

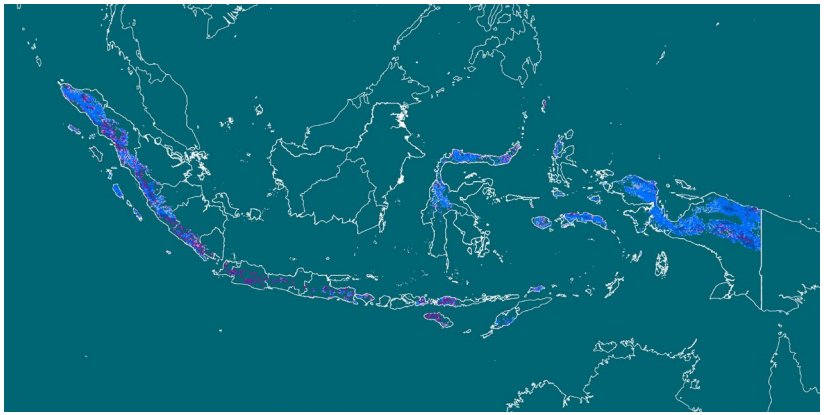
Wide regional areas are identified for protecting forests to reduce flood: in the Amazon forest, South-Eastern Asia (with the exception of central Thailand), Central Africa and the Eastern part of the US. Europe and China both have areas suitable for restoration or conservation measures. India, Myanmar, the northern part of Nigeria, most of Tanzania and Spain on the other hand, would benefit from restoration measures to reduce flood risks.

National analysis, however, leads to a different classification of the areas where disaster risk should be reduced as the main scope is to compare the ecosystem coverage and hazard exposure within the country rather than with other areas in the world.



National map: the Indonesian example - landslides

Indonesia is highly prone to landslides (both earthquake- and rainfall-triggered), with 70% of its population exposed (185 million) to these hazards across its territory. The country also contains one of the largest expanses of rainforests in all Asia. Our tool indicates that Papua would benefit mostly from protecting its tropical rainforests for reducing landslides, especially in the northern and western part of this province. Some of these areas are already within designated protected areas such as the Memberamo Foja Wildlife Reserve in the northern part. In Sumatra, many of the western areas of the island could benefit from ecosystem protection. This area, located around the Semangko fault, is known for its volcanic activities. Studies have identified that removal of vegetation covering slope surfaces and land use changes have triggered numerous landslides in this area. Sumatra island is one of the territories most impacted by tree cover loss in Indonesia. The plantation of deep-rooted vegetation is a popular remediation measure by local authorities and communities, due to its relatively low cost.



Where can I find the data?

The datasets are currently available to view and download online, as well as our interactive presentation on the tool:
pedrr.org/mapping-eco-drr-opportunities/

Sign in to PEDRR's newsletter if you want to receive regular updates!

Want to learn more?

Our work could help you prioritize your areas of intervention for ecosystem-based solutions to reducing disaster risk.

Contact one of us to explore collaboration possibilities.

Just write to us!
contact@pedrr.org

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