



Co-benefits of tropical peatland restoration

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The interest in investments in tropical peatland restoration is still limited, and largely driven by their potential for producing carbon emission reduction credits. Few investors are weighing the high biodiversity of tropical peatlands, and the depletion of regional environmental values that is caused by the loss of these ecosystems. Could investment interest be higher in an integrated approach that also considers the co-benefits of restoration for biodiversity, environmental and social conditions in the region, commanding premium credit prices?

Some considerations based on our experience and insights:

What is so special about the biodiversity of tropical peat swamp forest (PSF)?

Tropical peatlands in Southeast Asia are critically important, high-biodiversity ecosystems. They have high rates of endemism, i.e. species that occur nowhere else, particularly in fauna specialized for black water habitats. But they also form a last refuge for many species that used to occur in other habitats such as riverine lowland swamp forest that has recently disappeared from much of the region (except Papua). Some numbers:

- Over 1,500 higher plant species (mostly trees) recorded.
- One quarter to half of mammal and bird species on the IUCN Red List (endangered).
- Flagship species include orangutan, gibbons, Sumatran tiger, clouded leopard, sun bear, false gavia and hornbills.
- Lesser-known but scientifically significant species like the earless monitor lizard (*Lanthanotus borneensis*)—a living fossil—live exclusively in PSF habitats.

These species are lost after fire or conversion to agriculture. Restoration is their way back.

What other environmental roles do intact tropical peatlands play?

Intact peat swamp forests impact landscapes far beyond the peat dome itself:

- **The 'Sponge' Function:** Intact PSF stores rainwater and releases it slowly to streams during dry periods. Black-water streams draining intact peat domes have characteristically constant flows. This regulates discharge in larger downstream coastal rivers, reducing flood risk in wet seasons and saltwater intrusion during droughts. After peatland drainage, this sponge function is lost—leading to flood issues and saline river water.
- **Coastal Water Quality:** Peat water's distinctive chemistry—low nutrients, high acidity and dissolved carbon—regulates coastal water quality. This also maintains mangroves that serve as spawning grounds for marine fish, supporting regional fisheries.

Why does peatland restoration reduce emissions over a greater area?

In most cases, efforts to reduce emissions or enhance carbon stocks through land management only affect the intervention areas, e.g. by allowing forest regrowth or preventing



fires. In the case of tropical peatland restoration however, canal blocking raises water levels up to several kilometres away, especially in deep peat that has high water transmission capacity. In a typical situation where a drained area is rewetted, this means that peatland emissions outside of the intervention area are reduced as well.

Can ecosystem values return through peatland restoration?

Yes, where full rewetting is achieved and natural forest succession is supported—though recovery takes time and varies by ecosystem component:

- **Hydrological Recovery:** The sponge function gradually recovers as blocked canals fill with vegetation and the peat surface redevelops the rough hummock-and-hollow microtopography that was flattened by fires and plantation activities. This process begins within years of rewetting but reaches full function over decades.
- **Forest and Species Return:** Once rewetted, PSF species can return through natural succession from nearby forest remnants. Where remnants are distant or rapid regrowth is needed, targeted planting of native tree species accelerates the process. While highly specialised PSF species may be slow to colonise restoration areas, mobile target species like tigers and bears return quickly to rewetted areas adjacent to existing forest. This is particularly relevant for buffer zone restoration (see Insight Report B.3) where proximity to seed sources and wildlife populations is inherent in the design.
- **Carbon Capture in New Biomass:** Regrowing forest captures carbon in biomass—an additional creditable carbon stock on top of emission reductions from rewetting.

How do co-benefits translate into project value?

Co-benefits are increasingly monetizable through multiple pathways:

- **Certification:** CCB (Climate, Community & Biodiversity) and SD VISta (Sustainable Development Verified Impact Standard) certifications add price premiums to credits.
- **Corporate demand:** Major buyers increasingly require offsets that demonstrate measurable biodiversity and social impact beyond carbon, aligned with TNFD (Taskforce Nature-related Financial Disclosures) and GBF (Global Biodiversity Framework) reporting.
- **Biodiversity credits:** Emerging markets for such credits could provide an additional revenue stream from peatland restoration, independent of carbon crediting.
- **Risk reduction:** Projects with strong co-benefits face lower reputational risk and are more resilient to carbon market volatility.

SELECTED FURTHER READING (D4S PUBLICATIONS)

[Distance to forest, mammal and bird dispersal drive natural regeneration on degraded tropical peatland \(https://www.sciencedirect.com/science/article/abs/pii/S0378112719315907\)](https://www.sciencedirect.com/science/article/abs/pii/S0378112719315907)

[Benefits of tropical peatland rewetting for subsidence reduction and forest regrowth: Results from a large-scale restoration trial \(https://www.nature.com/articles/s41598-024-60462-3\)](https://www.nature.com/articles/s41598-024-60462-3)