



# VEGETATED BIODEGRADABLE EROSION CONTROL MESHES

SWB2



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ADDRESSED  
HAZARDSPROTECTED CRITICAL  
INFRASTRUCTURE

Large scale net greening with biodegradable coconut fibres and subsequent afforestation; Fröschnitzgraben, Lower Austria (A), 2024.  
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## Primary functions and key services

- **Erosion Control:** reduces soil loss on slopes, riverbanks, and construction sites, preventing sediment accumulation that can clog **drainage systems**, destabilise **roads**, and affect **bridges**.
- **Slope Stabilisation:** strengthens slopes to prevent shallow landslides, soil creep, and mudflows that can undermine **roads, railways, tunnels, and buildings in hilly and mountainous areas**.
- **Rockfall Protection:** vegetation cover stabilises rocky terrain, reducing the risk of small and large rock falls that pose hazards to **roads, hiking trails, and settlements near steep slopes**.
- **Flood Protection:** slows surface runoff, improves water infiltration, and reduces pluvial flood risks, helping safeguard **urban drainage systems, stormwater networks, and transportation infrastructure**.
- **Sediment Management:** prevents excessive sediment flow into **reservoirs, culverts, and waterways**, protecting **hydroelectric plants, drainage systems, and drinking water facilities** from clogging and contamination.
- **Wind Erosion Reduction:** anchors loose soil in dry and exposed areas, minimising dust storms that can impact **highways, airports, and solar energy infrastructure**.

## Site suitability, scale and coverage

Vegetated biodegradable erosion control meshes are suitable for alpine, mountain, rural, peri-urban, and urban regions prone to erosion, landslides, and surface runoff. Their effectiveness depends on terrain characteristics, climate conditions, and infrastructure needs.

- **Flexible Application:** can be adapted for slopes, riverbanks, construction sites, road embankments, and railway corridors..
- **Tailored to Local Conditions:** designed based on soil composition, hydrology, and vegetation types, ensuring site-specific performance.
- **Scalable Solution:** applicable at different scales, from small roadside embankments to large-scale projects.
- **Minimal Land Impact:** easily integrated into existing landscapes without requiring major land-use changes.

## What is it?

**Vegetated biodegradable** erosion control meshes are a nature-based solution used to stabilise soil and promote vegetation growth in erosion-prone areas, such as slopes and riverbanks. Unlike mats and blankets, meshes are typically lighter, consisting of a woven or netted structure that allows plants to grow through more freely. Made from biodegradable materials like coconut fibre or jute, meshes provide temporary protection while supporting vegetation establishment. The open design of meshes ensures better air and water flow to the soil, aiding plant growth. Over time, the mesh decomposes, leaving no waste and contributing to long-term erosion control.

## Challenges this NbS addresses

- **Erosion** – prevention/reduction: stabilise soil on slopes and disturbed areas by reducing surface runoff and preventing topsoil loss;
- **Landslides** – prevention/reduction: reinforce soil structure and promote root growth, which increases slope stability and reduces the risk of mass movement;
- **Climate change** – mitigation: promote plant growth, which captures and stores atmospheric CO<sub>2</sub>;
- **Wind Erosion** – prevention/reduction: anchor loose soil in arid and exposed areas;
- **Desertification** – prevention: help rehabilitate degraded land by promoting vegetation growth and soil retention;

## Ecosystem services

- ▶ **Biodiversity Support:** provides habitat for various plant and animal species.
- ▶ **Soil Fertility:** enhances soil regeneration by improving organic matter content and nutrient cycling.
- ▶ **Microclimate Regulation:** reduces temperature extremes and provides localised cooling benefits.
- ▶ **Carbon Sequestration:** stores carbon through plant growth and organic matter accumulation, contributing to climate change mitigation.
- ▶ **Water Filtration:** traps sediments and pollutants, improving water quality.
- ▶ **Water Retention:** enhances soil moisture storage, reducing drought impacts and supporting vegetation growth.
- ▶ **Air Quality Improvement:** captures airborne dust and pollutants, contributing to cleaner air.



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## ▼ Main components

- **Biodegradable Composition:** made from natural materials such as jute, coir, or biodegradable synthetic fibres, which decompose over time, leaving no harmful residues.
- **Enhanced Soil Stability:** provides a supportive framework for plant roots, helping to establish vegetation and stabilise soil, particularly in areas prone to erosion.
- **Increased Water Infiltration:** the mesh allows water to pass through while preventing soil displacement, promoting groundwater recharge.
- **Flexibility and Adaptability:** more flexible than blankets or mats, meshes can easily conform to irregular surfaces and provide erosion control for various terrains.
- **Quick Establishment of Vegetation:** the mesh promotes rapid seedling growth, enabling quicker vegetation establishment to reduce erosion risks.
- **Gradual Decomposition:** breaks down naturally as vegetation becomes established, eliminating the need for removal and reducing maintenance efforts.

## Environmental impacts (EU taxonomy)

- Climate change mitigation
- Climate change adaptation
- Sustainable use and protection of water and marine resources
- Transition to a circular economy
- Pollution prevention and control
- Protection and restoration of biodiversity and ecosystems.

## References

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