

# LIMNOS

## company for applied ecology

Alenka Mubi Zalaznik

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*Working with nature to protect the environment*

# About the company

- Natural ecosystems for protection and restoration of environment (NBS/ERM since 1994)
- Team of 6 (multidisciplinary) + more
- Focused to water treatment and protection; wetland technology
- Services:



Landfill sanitation  
(wetland leachate  
treatment)



sewage sludge drying  
reed beds



Pollution prevention in protected  
areas



Protection of water bodies  
(floating islands, vegetation  
strips)



Agricultural run-off  
mitigation



Constructed wetlands for  
wastewater treatment

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# Vision

To support communities in developing climate resilient and multipurpose solutions for water management and nutrient reuse.

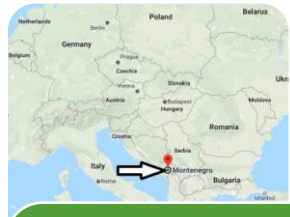
Focus on integrated local water management.

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# NBS for a country – holistic approach Montenegro

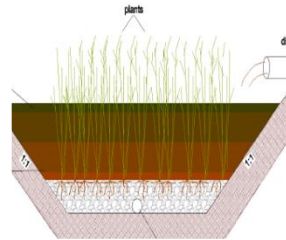
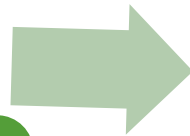
## PROCESS



Strategy (2013):  
Ecoremediation  
strategy of  
Montenegro



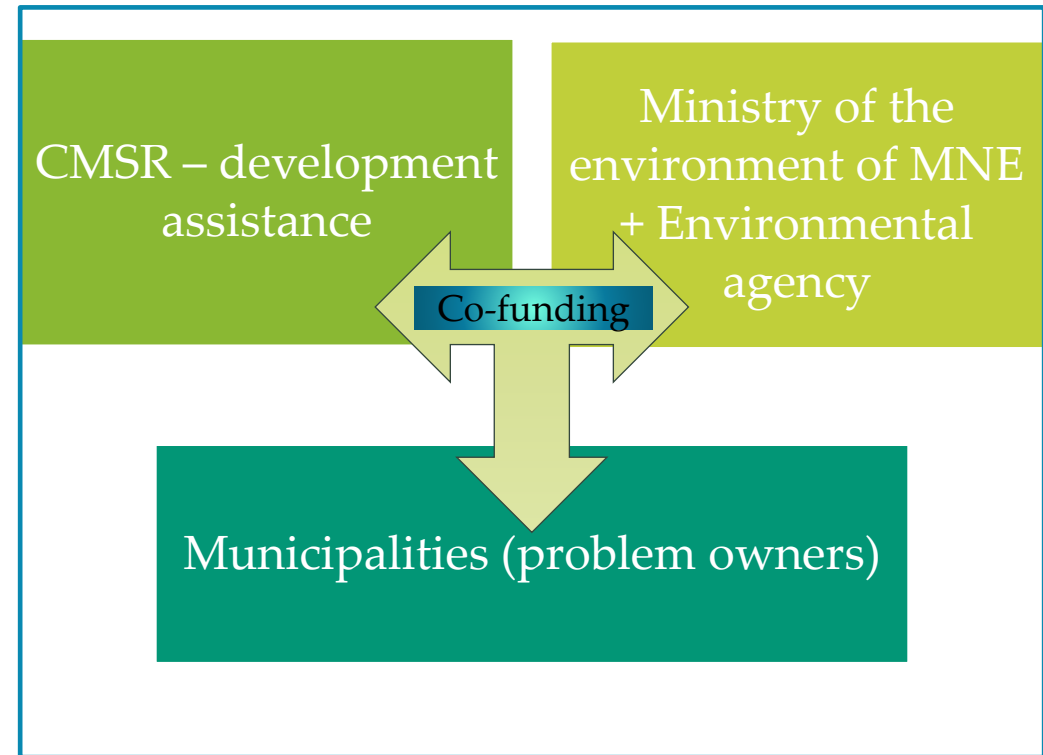
Action plan  
2014–2020:  
18 NB measures  
elaborated to  
display the  
implementation/  
benefit potential



Project drafting and  
implementation:

- Waste water treatment
- Landfill remediation
- Sewage sludge treatment
- Degraded area clean-up

## STAKEHOLDERS







Port Milena channel clean-up (resource efficient)



Šavnik 500 PE  
constructed wetland



Žabljak landfill  
sanitation & leachate  
treatment & SDRB



Mojkovac 2.500 PE  
sludge drying reed bed



Plav landfill sanitation  
& leachate treatment



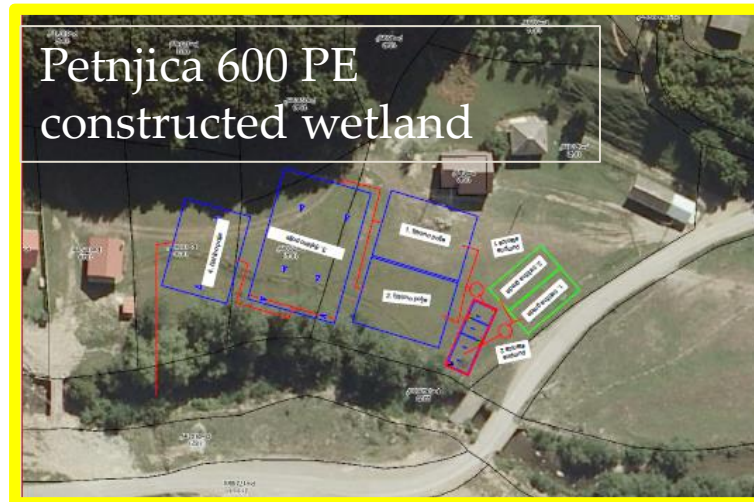
CW for a hotel, 50 PE



Vranjina 400 PE  
constructed wetland



Andrijevisa 1.200 PE  
constructed wetland



Petnjica 600 PE  
constructed wetland

**Project  
realisation  
(2014-2021)**



# Results and indicators

Result: Nr of implemented projects; **but:**

☹ still separate point-sourced pollution remediation projects (NB)

Bottom-up approach

Multidisciplinary  
cooperation

RESULTS

Better maintenance (local  
PUC)  
Further application of NBS  
solutions

RESULTS

Local job  
creation and  
growth

☺ network of partners created in the region

Type of NBS/ INDICATORS	Water treated / PE served	Area spared /reclaimed	Energy saving	Nutrient saving (reuse)	EFFICIENCY (standard indicators)
Constructed wetland	x		x	x	x
Sludge drying reed beds	x		x	x	x
Landfill sanitation	x	x	x		x
<i>Community-based project</i>		X (life quality)			?

# Sludge drying reed bed Mojkovac

## Direct economic benefits

- O&M cost saving: 29% or 2.329 €/year
- Improved energy efficiency of WWTP (energy consumption to remove 1 kg of BOD/day (COD/day) could be improved by 77% (16%))
- Nutrient reuse, different business models

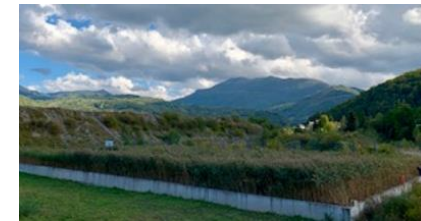
Contractual partnership (municipality/ operator – business entity)	Cost recovery price (covers excavation costs) = 4,35 €/ton of biosolids	Potential earnings (collection fee: 10 EUR/ton) = 5.850 EUR/operating cycle or 2,34 €/PE
Local-public partnership (municipality-operator-farmer truck)	Cost recovery price (covers excavation costs and stablishment of on-site storage facility for biosolids ) = 11,72 €/ton of biosolids	Potential earnings (selling price: 40 EUR/ton) = 27.018 €/operating cycle or 10,81 €/PE

## Indirect benefits: environmental

- GHG emissions: emit 60% less CO<sub>2</sub> and 84% less N<sub>2</sub>O
- Nutrient use: land application on agricultural land (prejudice), amount of biosolids (1000 tons per operating cycle) could be applied on 10% (465ha) of all local agricultural land
- Nutrient use: used for local erosion and forest restoration (fires)

## Indirect benefits: economic

- Local water tariff will not increase



# Awareness raising of the market on NBS

Important support to NBS on EU level

Initiatives: Companies stimulated to cooperate with stakeholders and showcase



Legislation: stimulating „think green first“  
Green procurement

Websites

Social media

Workshops and Zoom seminars

Network: Global water partnership,  
national associations members

Newsletter for customers



PULL



PUSH





Thank you for  
attention!

[alenka@limnos.si](mailto:alenka@limnos.si)

[info@limnos.si](mailto:info@limnos.si)

[www.limnos.si/en](http://www.limnos.si/en)

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