OPTAIN Optimal Strategies to Retain Water and Nutrients

Fact sheet | Grass or stubble in flood prone areas (Norway)

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The problem: Soil erosion in flood areas

Flood prone areas are located close to watercourses and are flooded regularly - at least once every ten years. If these areas are also prone to erosion (based on the erosion risk map; kilden.nibio.no) there is a high risk of soil losses that can leas to decreasing of water quality

About the measure

Perennial grass cover (or at least stubble during winter) in the areas prone to flooding and erosion aims to reduce soil and nutrient losses into watercourses. Grass cover protects the surface from detachment of particles and erosion processes, ; enhance infiltration and provide good conditions for the uptake and storage of water during temporary floods.

Examples of the area that is prone to flooding (Photo: D. Krzeminska)

Different policy instruments related to the measure

Grass in flooded areas prone to flooding and erosion are voluntary measures supported by Norwegian policy and can be in the form of subsidies. In exposed watersheds (ex. drinking water supply), farmers are obliged to implement management practices like permeant vegetation in flooded areas.

	Policy & incentive	Regulation document	Authority & support
Mandatory/Voluntary	Voluntary measures	Guidelines from directorate Group for Implementation of water regulation	Norwegian Environmental Agency (*Miljødirektoratet*)
Mandatory/Voluntary	Obligatory in the exposed watersheds *(6 m of permanent grassed buffer zones + 2m obligatory natural buffer zones*)	*Environmental requirement (Miljøkravet)*	County Governor (*Statsforvalteren*)
Economic support	Establishing and maintenance (*min 6 m width; in prioritized aeras*)	Regional Environmental Programme (RMP)	County Governor (*Statsforvalteren*) Municipality
Advisory service	Public support, research institute support	Regulation on RMP §35.Climate advisory Public agricultural advisory service	Municipality Ministry of agriculture and Food (*LMD*) Norwegian Agriculture Advisory (*NLR*), Norwegian institute of bioeconomy research (*NIBIO*)

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Examples of benefits of the measure

The efficiency of vegetation cover is composed of a variety of factors; therefore, effectives of these measures are to a large degree site specific[1,2]. In Norway, there are no direct figures for the efficiency of grass cover on the areas prone to flooding. Listed examples of grass waterways benefits come from WOCAT database and http://nwrm.eu/

Impact level	Benefits	Examples of beneficiaries
Local level	Reduce soil erosion/soil loses	Farmers, soil conservation
	Improve infiltration/retention capacity	Farmers, water management
	Nutrient losses	Farmers
Sub-basin	Increase retention in the landscape	Farmers, local communities, fishers, drinking water management, local wildlife
	Prevent soil losses	Farmers, local communities
River basin	Improve water quality (eutrophication)	People in the river basin, regional food production and environment
	Runoff attenuation/flood prevention	
	Prevent land degradation	

Grass cover in the area prone to flood and erosion (photo A-G.B. Blankenberg)

Resources

Advisors and other actors:
County Governor (Statsforvalteren), Norwegian Environmental Agency (Miljødirektoratet), Norwegain Agriculture Advisory (NLR), Norwegain Institute of Bioeconomy Research (NIBIO)

Websites and document *(examples)*:
https://nibio.no/tema/miljo/tiltaksveileder-for-landbruket/vannmilljotiltak/grasdekte-vannveier
https://nibio.brage.unit.no/nibio-xmlui/handle/11250/2606382
https://qcat.wocat.net/en/wocat/

Reference:
[1]Blankenberg A-G.B. et al. 2017. NIBIO RAPPORT;3(14)
[2]Kværnø et al 2020 NIBIO POP. 2020