



Synthesis by: D.Krzeminska & A-G.B.Blankenberg

The problem: Soil erosion due to concentrated overland flow

The overland flow can be concentrated in topographic depressions, "thalwegs" in the field. Concentrated runoff in such watercourses can create small rills or even gullies.

About the measure

Grassed waterways are important conservation measures managing concentrated flow. They are intended to reduce runoff velocity and soil erosion by grass roots binding the soil. They are normally sited downslope along natural depressions leading water away from agricultural fields. To control surface runoff, grassed waterways are often combined with inlets for surface water leading runoff to drainage pipes. An alternative to grassed waterways is to leave the natural waterways covered in stubble over winter.



Problem – gully erosion



Possible solution – grassed waterways

Examples of the location of grassed waterways to address problem of gully erosion in the field (photos: A-G.B.Blankenberg)

Different policy instruments related to the measure

Grassed waterways are voluntary measures supported by Norwegian policy in the form of subsidy systems: Regional Environmental Programme (RMP).

	Policy&incentive	Regulation document	Authority & support
Flexible / Mandatory	Included in the list of voluntary measures	Guidelines from directorate Group for Implementation of water regulation <i>(following the Water Resources Act and the Watercourse Regulation Act)</i>	Norwegian Environmental Agency <i>(Miljødirektoratet)</i>
Economic support	Establishing and maintenance <i>(min 6 m width)</i>	RMP <i>(Regionalt miljøtilskudd I jordbruket)</i>	County Governor <i>(Statsforvalteren)</i> 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)



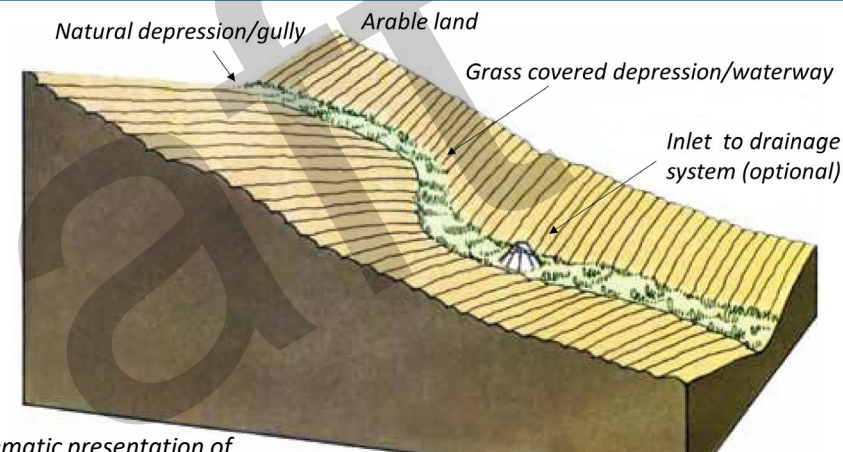
Examples of the measure in agricultural catchment: grassed waterways (A-G.B.Blankenberg) and field covered with stubbles in topographic depression (D.Krzeminska)

Examples of benefits of the measure

The efficiency of vegetation cover is composed of a variety of factors; therefore, effectiveness of these measures are to a large degree site specific^{1,2,3}. For more examples of grass waterways benefits go to: <http://nwrn.eu/> and/or [WOCAT database](#).

NOTE: In Norway, there are no direct figures for the efficiency of grassed waterways

Impact level	Benefits	Examples of beneficiaries
Local level	Reduce soil erosion/soil losses	Farmers, soil conservation
	Improve infiltration/retention capacity	Farmers, water management
	Nutrient losses	Farmers
Sub-basin	Improve water quality	Farmers, local communities, fishers, drinking water management, local wildlife
	Create terrestrial habitats	Local wildlife, NGOs, fishers, nature protection
	Improve biodiversity	Local communities, Local wildlife, NGOs, fishers, nature protection
River basin	Improve water quality (eutrophication)	People in the river basin, regional food production and environment
	Improve resilience	
	Prevent land degradation	



Schematic presentation of grassed waterways in topographic depressions in the field (L. Øygarden)

Resources

Advisors and other actors:

County Governor (Statsforvalteren), Norwegian Environmental Agency (Miljødirektoratet), Norwegian Agriculture Advisory (NLR), Norwegian Institute of Bioeconomy Research (NIBIO)

Websites and document (examples):

<https://nibio.no/tema/miljo/tiltaksveileder-for-landbruket/vannmilljotiltak/grasdekte-vannveier>
<https://qcat.wocat.net/en/wocat/>

Reference:

¹Blankenberg & Skarbøvik E. 2019. NIBIO POP 5(10)
²Kværnø et al 2020 NIBIO POP. 2020
³Øygarden et al. 2019 NIBIO Rapport;5(55)