



*REGARDS*

*REsilience of marginal GrAssland and biodiveRsity  
management Decision Support*

**NTNU, SVT-FAKULTETET**

# **Work Package 4**

# **Country Report Norway**

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## General relevance of permanent mountain grassland and present trends

Given both the latitudinal as well as the altitudinal character of Norway natural grasslands and alpine pastures have been of crucial importance for agriculture (Daugstad 2013, Daugstad et al 2014, Helhetlig gjennomgang av miljøvirkemidler i jordbrukspolitikken 2015, Shucksmith and Rønningen 2011). Only 3% of the total land area is under cultivation. Animal husbandry (production of meat, milk and wool) with a need for grazing grounds implies that a large outfield area (forests, moors, alpine natural grasslands) supports farming as such. As an example, 50% of the fodder uptake in sheep production comes from the outfields (Helhetlig gjennomgang av miljøvirkemidler i jordbrukspolitikken 2015). A cornerstone for a large part of Norwegian agriculture or more specifically the dairy production has been the system of summer farming – *seterbruk*. *Seterbruk* is a type of transhumance implying that the main part of the livestock are moved from the permanent farm in the village to a temporal settlement in the mountainous areas during the summer months (circa from June to September) in order to make use of the free grazing grounds while the cultivated land at the permanent farm is used for fodder production for a long winter stabling period and for production of grain and vegetables (Daugstad 2000, Daugstad et al 2014, Olsson et al 2000). This transhumance system was at its peak mid 19<sup>th</sup> century and declined in the 20<sup>th</sup> century due to the major changes following the introduction of chemical fertilizer, a centralization of dairy production and the general mechanization and modernization in animal husbandry making this time- and labor consuming resource use system less viable (Daugstad 2000). In 1939 12% of the farms has a summer farm in use, in 2012 it was only 3% of the operating farms who were involved in the use of a summer farm (Helhetlig gjennomgang av miljøvirkemidler i jordbrukspolitikken 2015).

The development in agrarian landscapes in Norway can be described by intensification and extensification processes – intensification on the most central land suitable for large scale harvesting, and extensification on the areas less accessible and more remotely located from the permanent farm, typically in hilly or steep areas (Daugstad et al 2014, Pedersen and Engan 2013, Shucksmith and Rønningen 2011).

There has been a dramatic decline in the number of farm units who actually operate as an active farm with agrarian production. The number of active farms in 2010 was 23% of the number in 1949, respectively 49 800 in 2010 and 213 444 in 1949. ‘Active farms’ means farms where the residents are involved in agrarian production and applying for agricultural subsidies (Dramstad and Sang 2010). The numbers continue to drop and in 2013 the figure was 43 525 (Helhetlig gjennomgang av miljøvirkemidler i jordbrukspolitikken 2015). However, the total land area under cultivation has been

stable. This can be ascribed to the fact that the land on abandoned farms is leased to the neighbor farm (Løwe 2006). According to Dramstad and Sang (2010) very little agrarian land changes ownership in this restructuring process, land tenancy is the main mechanism at play. In some regions as much as 40% of the agrarian land is under tenancy (Dramstad and Sang 2010). Mostly it is the exact same area that is kept under cultivation but also in some an 'areal move' when some agrarian land is converted to built-up area and infrastructure and some new areas are cultivated. The national figures hide some regional differences. As an example, in Rogaland county, which is where we find the most intensively farmed land in the country, there has been a decline in the number of farms in the period from 1969 to 2010 with about 50% while the total agrarian land area has increased with 40% in the same period (Stokstad and Puschman 2012). Rogaland is an exemption, the general picture is a decline in number of farms but the land under cultivation is the same.

A large part of what seems to be natural vegetation in mountain areas are in fact semi-natural habitats influenced by grazing, mowing and collection of firewood over centuries. This activity is part of the mentioned *seterbruk* system but free-roaming livestock grazing in the mountains is also a phenomenon not related to a *seterbruk* dwelling. In any case, these practices are substantially reduced and the cultural landscapes of the mountains are subject to succession processes where bushes and forest take over. This is unanimously documented in a number of studies (for example Bryn 2008, Olsson et al 2000, Daugstad et al 2014, Potthoff 2007). The national picture of regrowth is addressed by Bryn et al (2012) stating that about 16% of the open land in the outfield's today would revert to forest if all human use ceased. Parts of the open areas which are open due to centuries of grazing, mowing, logging and collection of firewood are still in use while more and more of them have been abandoned. The reason why these areas to some extent still remain open is due to a time-lag before bushes and trees take over after the human influence has stopped (Bryn 2008).

Bryn (2008) discusses to what extent effects of climate change has started to influence the vegetation cover and regrowth rate in Norwegian mountains or if the vegetation effects can be ascribed to less use of the outfields through grazing etc. In his case study in a typical mountainous transhumance landscape in interior southern Norway, the regrowth of semi-natural habitats in the period 1959 to 2001 is substantial. Further, the uppermost forest limit (consisting of mountain birch) expanded 32 m upwards in the same period. Bryn concludes that these changes can be ascribed to an abandonment of outfield farming practices. There is a tendency after 1995 of increased rates of regrowth which, according to Bryn, might indicate a possible response to increased temperature due to climate change but this need to be further investigated and monitored.

The following table shows some figures illustrating the decline in grazing in the outfields for different types of animals. The numbers indicate 'fodder units' (a standardized measure for fodder

consumption where different types of fodder of different quality are taken into consideration) in total over the period 1939 to 2009 and the division of these fodder units between the different types of animals (taken from: Helhetlig gjennomgang av miljøvirkemidler i jordbrukspolitikken 2015).

Type of animal	1939	1959	1974	1996	2003	2006	2009
Total fodder units consumed, in millions	740	490	245	303	317	311	307
Sheep, percent	31	46	70	70	69	67	67
Cattle, percent	58	47	26	27	28	30	30
Goats, percent	3	2	3	2	2	2	2
Horse, percent	8	5	1	1	1	1	1

Most of the land area in Norway is outfield areas – meaning commons or also privately owned land but consisting of non-planted forests, mires, alpine grasslands and moors. As mentioned parts of these areas have been used as grazing grounds or mowing land in centuries and even if much of this area is subject to regrowth there are still areas where grass species with good nutrient value dominates. If one takes away the 3% cultivated land and the 3% built-up area in the country, 96% is outfield of different sorts (Rekdal 2014). Rekdal (2014) underlines that these areas can contribute to an increase in the self-sufficiency rate of Norway as fodder resources for domestic animals (sheep, cattle, goats, domestic reindeer). 45% of the outfield areas are well suited as grazing land – this is not evenly distributed but as an example Troms county (the second Northern-most county) has 22% of the outfield areas of the county in the best category grazing land, while Hedmark county in interior southern Norway has only 5% in the same category (Rekdal 2014). Another issue raised by Rekdal and Angeloff (2012) is that in some upland communities the best quality grazing land (in semi-open natural birch forest) are also areas attractive for building of cabins and if cabins are built the grazing potential will be considerably reduced – this is for example the case for Oppdal.

‘Permanent grasslands’ is not a concept or category used in agrarian statistics in Norway. Grasslands imply to things: grasslands around the farms used either for mowing, for pasture or a combination and these areas are privately owned; grasslands in mountainous areas or in semi-open forests – such areas can be cultivated plots used for mowing or grazing or both, but the most substantial category here are natural/semi-natural grazing grounds. The cultivated areas are mostly privately owned (and some of these areas are enclosures around transhumance plots) but the natural/semi-natural grazing grounds are mostly state commons where farmers in the village/region have rights to grazing resources.

## Societal claims to permanent grassland management

Given the outlined development in the agrarian influenced mountain areas of Norway, the multi-functions or multiple landscape values of this type of cultural landscapes has been underlined in a number of studies (see for example Daugstad et al 2006, Hemsing and Bryn 2011, Olsson et al 2000, Shucksmith and Rønningen 2011, Soliva et al 2007, Øian and Rønningen 2013). These landscape values can be in conflict or strengthen each other:

**Biodiversity:** A number of red-listed species are found in these semi-natural or cultural landscapes in the mountains. The plants (and insects to some extent) are there because of centuries of mowing and grazing activity and they are threatened by bush and forest encroachment (Olsson et al 2000, Kålås et al 2010). For Norway as such, 40% of the red-list species are linked to cultural landscapes (Rønningen et al 2012).

**Cultural heritage:** The use of alpine areas and the practice of transhumance have at least a 1000 year long history in Norway (Daugstad 2000) and is part of the national history and heritage.

Archaeological remains as well as built structures (dry stone walls, houses, enclosures) are seen as important heritage and some of these items are listed cultural heritage objects according to the Cultural Heritage Act.

**Identity:** For many mountain communities the heritage of the cultural landscapes of the mountains is central to the feeling of identity and belonging (Daugstad 2000).

**Recreational value:** The mountain areas have been a recreational asset for local inhabitants as well as a cornerstone in the strong outdoor recreation tradition for the country as such. A number of the mountain inns for hikers in the Norwegian mountains are formerly transhumance cabins and studies show that the transhumance history and the imprints from agrarian activity in the mountain landscape are viewed as increasing the recreational value for hikers (Daugstad 1999, 2008, Eiter 2010). Recent studies of Norwegian as well as foreign tourists in Norway show that the imprint of man on nature is seen as a quality (Vinge and Flø 2012). Hence, overgrowth of cultural landscapes in the mountains is a concern from a recreational point of view. It is also an issue that might have an economic effect for the tourism industry in a negative way. In a recent research project (Bryn et al 2012) the effect of these landscape changes, with bush encroachment and an increase in the total forest cover, have been addressed from the perspective of both hiker's interests and tourism interests. As an example 45% of the present mountain inns run by the Norwegian Trekking Association are located in areas that would change to forest if all agrarian-related activity stopped.

Economic value in farming: As shown the use of the outfields as a fodder resource is decreasing while the potential fodder resources in the outfields are pointed out by Rekdal and Angeloff (2012) and Rekdal (2014).

## Formal governance instruments

The agri-environmental measures in Norway can be divided into measures under the National environmental program, the Regional environmental program, and Special environmental measures. Some of the measures are the responsibility of the Ministry of Agriculture and Food (MAF) alone, some are a shared responsibility for MAF and the Ministry for Climate and Environment (MCE), and some are the responsibility of MCE (Helhetlig gjennomgang av miljøvirkemidler i jordbrukspolitikken 2015).

Under the national environmental program the MAF-measures are the Area- and cultural landscape measure, National grazing measure (for outfields as well as infields) and Measure supporting old livestock breeds. National measures under the MAF and MCE in cooperation are Measures for selected cultural landscapes in agriculture and Measures for world heritage areas (supporting grazing activity in 2 WH areas). National measures under MCE are Measures to cultural landscapes of special value and to management of protected areas, Measures supporting listed buildings and cultural heritage, and Measures preventing damage by carnivores on livestock.

Measures under the Regional environmental program under the responsibility of MFA are a number of different ones: support to mowing of steep areas, support to herding, support to grazing in outfields, support to transhumance activity etc.

The Special Environmental Measures are managed at the municipal level and typically focus on supporting biodiversity in cultural landscapes, facilitating infrastructure for recreational use in cultural landscapes, supporting maintenance of cultural heritage and listed buildings.

The measure for Selected cultural landscapes of agriculture was established in 2009, as mentioned this is a measure under the National environmental program and this measure is the joint responsibility of MAF and MCE. More specifically three directorates are behind this measures: The Norwegian Agriculture Agency which sorts under the Ministry of Agriculture and Food, and the Directorate for environment and the Directorate for cultural heritage – both sorting under the Ministry for Climate and Environment. For the first time in the history of agri-environmental measures this measure implies a tight cooperation between the three directorates. So far 22 areas have been designated for this status based on special qualities in biodiversity and cultural heritage.

The aim is to encourage farmers and land owners to make an extra effort in taking cultural landscape concerns and implement activities to uphold the cultural landscape qualities (Øian and Rønningen 2013). Five of the 22 selected landscapes are mountain communities and/or include transhumance areas (Landbruksdirektoratet 2015).

Shucksmith and Rønningen (2011) point to the fact that Norwegian rural or agrarian policies have been relatively undifferentiated in terms of not highlighting mountain and upland areas more than other areas. In 2005 the Government recognized a need for a special policy targeting upland and mountain communities. This was a response to lobbying from the municipalities in the 'Mountain region cooperation' – consisting of 430 municipalities from mountain regions in Mid- and Southern Norway. This association of municipalities point to some common challenges of mountain communities (related to part-time farming, depopulation, extensive productions with the use of outfield areas, public goods production) which needs to be addressed and who needs special measures. So far this group is still lobbying for their cause, and there are examples of specific projects being implemented which focus on mountain communities – an example is a project supporting tourism development related to national parks.

## Suggestions for future governance interventions

The agri-environmental measures have just been evaluated by a group of experts/bureaucrats from three ministries (MAF, MCE and the Ministry of Finance, plus representatives from the two main farmer's organizations). They produced a report presented in February 2015 (Helhetlig gjennomgang av miljøvirkemidler i jordbrukspolitikken 2015). Their mandate was to evaluate if the measures were adequate in addressing the environmental challenges, and, further, to consider if the total number of measures could be reduced and the whole system more effectively managed. They found that the measures were successful to a varying degree. Their main recommendations are that some measures can be merged, some can be removed, and that the implementation can be more uniform and effective than it is today. The more specific implementation of the measures in practice (for example who will be involved in the implementation) is not specifically addressed.

Vistad et al (2013) and Øian and Rønningen (2013) have studied how farmers taking part in the scheme Selected cultural landscapes of agriculture (introduced as part of the national environmental program in agriculture in 2009). Firstly, the farmers see this measure as a chance to maintain buildings as well as landscapes that would otherwise be hard to uphold. Secondly, this measure also represents a chance to uphold cultural landscape areas that can be used to increase the food production at the farm. As a third point, the measure contributes to strengthening the economic

viability for the farm as such which can make it more likely for the next generation to take over. Farm succession is on the other hand seen as a challenge for future upholding of the measure and these cultural landscapes. Overall, the uptake of this measure indicate that it is a success, however, as pointed out by Øian et al (2013) as well as by Burton et al (2009), success in measure uptake might be a short term phenomenon – many farmers involved in the measure are close to retirement and it might be less likely that the next generation are willing to go into the same measure regime as the present generation. Joining the scheme requires some form for special commitment and willingness to invest time. Further, Vistad et al (2013) find that so far the co-operation between farmers, which is a necessity for successful uptake of this measure, is based on informal agreements. The informality might be a challenge for the future as there is no legal framework regulating this measure, it is based on voluntarism and a will to work together. In total: This measure has a holistic approach (biodiversity, heritage, cooperation) that one see can make a difference in terms of upholding important qualities, on the other hand the informality of the measure as well as the general succession issue, is a challenge. Vistad et al (2013) suggest to formalize the co-oration as well as considering giving these areas some form of protection status embedded in a legal framework.

In the light of climate change, the Norwegian government has a focus on increasing the self-sufficiency rate. Presently the self-sufficiency in terms of calories is 50%. As a strategy to reach this goal the country's food production is to be increased within 20% the next 20 years. According to Rønningen et al (2011) this can be achieved either by increasing the agrarian production in the most productive areas in central Southern Norway, or by focusing on the outfield grazing resources. The grazing capacity in the outfields can be doubled compared to today (Norsk institutt for skog og landskap 2011).

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