‘Landbruk’, value creation, and woodlands in southwest Norway

“Farming (landbruk) has historically always devoted itself to value creation from all available natural resources” - Per Skorge, Secretary General Norwegian Farmer’s Association, 2017.

Duncan Halley
duncan.halley@nina.no

www.nina.no/english/Home
‘Landbruk’ – Land use

• ‘Landbruk’ (pron. ‘landbrook’) is a central concept in understanding how land is used in Norway.

• ‘Landbruk’ literally translates as ‘Land Use’

• But is usually translated into English as ‘farming’ or ‘agriculture’. This can be misleading.

• ‘Landbruk’ is a wider concept. It means making a living from the land, most usually from diverse sources.

• Usually several income generating activities are carried out on any given piece of land, by the same owner/occupier landowner. Monocultural use is rare, except on ‘agricultural fields’ (arable and inbye grazing), which are 2.7% of Norway.
Geographical Definitions

South-west Norway

- Hordaland
- Rogaland
- Aust-Agder

West Norway Statistical Region

- More & Romsdal
- Sogn & Fjordane
- Hordaland
- Rogaland

Area: 33318 sq. km
(Highland Region, Western Isles & Argyll and Bute: 35639 sq. km)

Area: 58582 sq km
(Area of Scotland N & W of Firths of Tay and Clyde: 56301 sq km)
Climate comparisons

(maps to scale and in correct relative positions)
Mean Annual Windspeeds

- Baltasound: 6.9 m/s
- Hellisø: 7.6 m/s
- Lerwick (S. Screen): 7.5 m/s
- Fair Isle: 7.4 m/s
- Kirkwall: 6.9 m/s
- Røvær: 6.8 m/s
- Utsire: 8.2 m/s
- Kvitsøy: 6.5 m/s
- Eigerøya: 8.0 m/s
- Lindenes: 7.8 m/s
- S. Uist (Range): 7.1 m/s
- Barra airport: 7.5 m/s
- Tiree: 7.3 m/s
- Islay airport: 6.4 m/s
- Campbeltown airport: 6.2 m/s

Sources: Meteorological Office
Meteorologisk institutt
Geology

Source: Norges geologiske undersøkelse
Jæren 1905

Assynt c. 1910
N. Uist

Jæren

(both early 20th Century)
Peat cutting in the mid 20th Century

Gairloch

West Highlands

West Norway

West Norway
Fidjadalen 1927

Fidjadalen 2007

http://jarenfri.no/no/steder/friluftsgarden-man/
Fonnes, Hordaland 1971

Pines planted 1907 >

Fonnes, Hordaland 2005

Photos: Miljødirektoratet

Grazing pressure reduced from 1975
**Metabolic biomass per sq km all large herbivores.**
West Norway 1949-1999

<table>
<thead>
<tr>
<th>Year</th>
<th>MBA for all large herbivores (kg/km²)</th>
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<tbody>
<tr>
<td>1949</td>
<td>250</td>
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<tr>
<td>1959</td>
<td>150</td>
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<td>1969</td>
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<td>1989</td>
<td>80</td>
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<td>1999</td>
<td>60</td>
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*MBA* - *Utmart*, i.e. rural areas excluding inbye fields but including woodland, rough grazing, etc.

**Metabolic biomass (kg/km²), livestock and deer, West Norway**

<table>
<thead>
<tr>
<th>Year</th>
<th>MBA (kg/km²)</th>
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<tr>
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**Deer**

**Livestock**

**Proportion of browse in diet all large herbivores, West Norway, 1949-1999**

<table>
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<tr>
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<th>Proportion of browse in diet (%)</th>
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<tr>
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<td>30</td>
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<td>40</td>
</tr>
<tr>
<td>1999</td>
<td>50</td>
</tr>
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</table>

Source: Austrheim et al 2008
Goals of Rural Community and Farming Policy: Norway

• Safeguard the supply of sufficient, safe and varied high quality food at a reasonable price, including in times of war or crisis
• Preserve the distinctive features of Norway's settlement pattern (and prevent ‘push’ migration to cities, with potential for the formation of a periurban underclass expensive in health, social security, and policing costs)
• Protect and enhance the viability of rural communities
• Utilise the human and natural resources throughout the country in order to create the greatest possible national prosperity
• Guarantee farmers and food producers optimal working conditions
• Conserve land quality
• Conserve and enhance the environment and natural heritage
• Ensure equal living conditions
• Offer people the freedom to settle wherever they choose

Norwegian Ministry of Agriculture and Food; Ministry of Local Government
'Land Use' (farming, forestry, hunting etc) properties per 5km grid square

- 12 or fewer (<0.5/sq km)
- 13-25 (0.5-1/sq km)
- 26-75 (1-3/sq km)
- 76 or more (>3/sq km)

Gray: state owned, state common lands ('Statsallmenning'), etc. (mainly high mountain plateaus above the natural treeline)

Source: Statistics Norway (www.ssb.no)
Population densities, Highland Region and SW Norwegian provinces

The two areas have very similar climates, geologies, and landforms; see http://tinyurl.com/zfvwbnh
Land use properties with different combinations of farmland and woodland, SW Norway (Vest Agder, Rogaland, Hordaland), 2010

Source: Statistisk sentralbyrå
6.4% of the population of SW Norway are resident on Landbruk properties.

While ownership is individual, properties are typically worked by families.

Average annual income, all sources: 618667kr (c. £55 000)

Source: Statistics Norway
Summary - landuse

- Norway’s land use system is very differently structured to Scotland’s.
- It has a highly dispersed ownership pattern, mainly in small-medium owner-occupied units. They exploit the land in a diverse manner – farming, forestry, hunting, cabins are all major income streams. External employment is a usual part of the mix.
- Agricultural payments cost £1.14 billion in 2015, 1.2% of government spending (less than half of the £2.5 billion overseas aid budget).
- Scottish annualised CAP payments projections 2015-20: £1.1billion/year*.
- Norwegian external tariffs on agricultural products are much higher than the EU’s.
- Almost all the money flowed to and through landusers resident in rural communities. They are 3% of the total population; very much more in rural areas.
- This underpins the whole rural community – the shops, schools, social institutions.
- The system enjoys relatively broad social consensus.

*Source: Scottish Govt
Woodland expansion: area

• The total area of forest classified as ‘productive’ increased in SW Norway by 55% 1963-93 (Source: Norwegian Forest & Landscape Institute).

• ‘Productive’ is a forestry statistics term. It means potential increase in harvestable timber volume of >1m³/ha/year, whether or not harvested for timber.

• Between forest inventory periods 2005-09 and 2010-14 the annualised increase in area of woodland in West Norway was 305 sq. km/year, or 2.6% of the land area over 5 years. (Data: Statistisk sentralbyrå)

• Almost all of the expansion in area in the period 2005-2014 has been through natural regeneration.

• Scottish Forestry Strategy (2006) for increased forest area: 17% to 25% of land cover (+8% increase) by 2030; 1000 km² increase by 2022.
Spruce & pine increases mainly natural regeneration, partly planting. Deciduous almost entirely natural regeneration.
• Planting (of conifers) was relatively common in the period of woodland restoration
• Natural regeneration now dominates, even in pure commercial forestry stands
• Farmer-owned woodland is now almost all regenerated naturally
• The Norwegian Forest Law of 2010 requires all owners to ensure adequate regeneration of woodland following any harvest.
• Deer fencing is never used (except on deer farms and along a few busy periurban roads).
Woodland expansion: standing mass of timber and carbon sequestration in West Norway

- **Annualised increase in standing timber volume 1996-2010:** 3 943 800 cubic metres / year
- Using volume increase ratio 1996-2010 spruce:pine:deciduous (mainly birch) and UK [Forestry Commission conversion factors](https://www.forestry.gov.uk) this represents an annual sequestration of 0.99 million tonnes of carbon.
- Notional value, [EU CO² emissions auction price](https://ec.europa.eu/clima/policies/australia_en) 30.04.2019 (€26.19/tonne CO²): €95.1 million/year (£81.7 million)
- Does not include bark, branches, leaves, root system, or soil carbon.
- [Scottish Forest Strategy sequestration target](https://www.forestry.gov.uk): sequester 1.0MtC annually by 2020 through woodland expansion.

*One tonne of carbon equals 3.67 tonnes of carbon dioxide.*
Most forestry is owned by and integrated with owner-occupied ‘land use’ (farming) units for fuelwood harvesting, hunting, grazing, cabin rentals, etc.

Harvest and sales of timber are mainly organised through owner’s cooperatives.

Ownership of forestry in Norway

www.nina.no
Orkdal is a typical ‘glen kommune’, in Trøndelag; fields mainly in the strath, woodland on the hills.
Forestry cooperatives

Most woodland/farming properties in Norway join regionally-based forestry cooperatives.

These have 36,000 family owners and an 80% share of the Norwegian timber market.

They do the bulk of timber management, harvesting and sales.

This allows for investment in modern machinery and other economies of scale.

Woodland is exploited for other purposes (hunting, grazing, cabins, recreational sales, etc.) by the owners individually.
Non-timber sources of income from woodland, Norway, 2007

Data for all Norway.

Does not include grazing of domestic stock.

Total: 896 000 000kr (€110 000 000; £74 000 000; 2007 exchange rates)

Source: Statistisk sentralbyrå
Some woodland is in clear-fell rotation for timber (as primary income source)

How ‘landbrukers’ create value from woodlands in SW Norway
More is in mixed-use for timber, firewood, grazing, hunting, and forest products.
Trees in this form of management are felled in small cuts, or selected individually ("plukkehøgst"). This results in a more varied woodland structure.
Grazing

Holtålen, Trøndelag (875m asl)
Hunnedalen, Rogaland (661m asl)
Woodland as shelter: movements of radio collared sheep (green = open birch woodland)
Effects of mutual shelter: wind-bent ‘granny pines’ scattered among straight young adult pines, naturally regenerated since the 1930s following reduction in grazing pressures. (Songli, coastal Trøndelag, 300m asl).
Fuelwood
2009 household fuelwood consumption: 1,600,000 tonnes or 816kg per household*

2008 declared income from fuelwood sales: 323 million kroner (£37 million)*

*Source: Statistisk sentralbyrå
Hunting

https://www.environment.no/topics/outdoor-recreation/hunting
Deer hunting: «Reading» the terrain and wind conditions
Stalking in open woodland

Stag is about 3 years old
A successful stalk: a good average adult stag, c. 85kg dressed carcass weight
Dressed carcass weights of red deer *

*Gralloched, head & lower limbs removed. In Scotland, with skin on; in Norway with skin removed.

Data: Highlands James Hutton Institute; Norway: www.hjortevilt.no

*Weight of 1 ½ year old Scottish hind hide, 2015: 5kg 2 ½+ hind: 6kg. Source: Deer Consultancy Services
Scottish-stock red deer moved to English deer parks and to New Zealand reach Norwegian/English park weights in two generations (1st generation affected by maternal size); and vice versa for English park stock moved to Scotland.

Subfossil Highland red deer bones are of Norwegian/New Zealand/English stature.

Data: Highlands James Hutton Institute; Norway: www.hjortevilt.no; UK farmed University of Bangor

(Yearlings are the best indicators of relative population condition. UK farmed animals are of UK, and mainly Scottish, genetic origin)
Year given is year hunting season began (ie 2011 = 2011-12 hunting season)

NB Tysnes red deer > 30% larger than W.Affric/Kintail red deer

Data: www.hjorteviltregisteret.no; http://affrickintaildmg.deer-management.co.uk
Area: 255 sq km
Population: 2782

(10.9/km²; Highland region excluding Inverness: 5.95/km²)

Climate and geology similar to Mull/Morvern. Formerly almost completely deforested.
• Red deer are the main deer species hunted in the Highlands and in SW Norway.
• The two areas are closely similar in climate, geology, and landforms.
• Both used to be strongly deforested.
• Woodland in red deer areas of SW Norway now regenerates by natural means.
• While woodland in red deer areas of the Highlands generally does not.
• Red deer offtake in deer hunting areas, per unit area, is similar in the two regions.
• How does Norway achieve the same harvest levels per unit area as Scotland, but still get woodland regeneration?
• The key to understanding this is the the higher offtake levels in Norway.
• Population densities are lower, allowing regeneration, but harvests are sustainably higher per unit area, in both venison weight and trophy head quality terms.
• This is because red deer in SW Norway and elsewhere are very much larger than in the Highlands (and this is not for genetic reasons).
• And because well-nourished deer breed more rapidly, and non-hunting deaths (eg winter starvation) are rare.
• The result is just as many, but much bigger, deer are harvested - from land which has multiple other economic uses in addition.

Data
Norway: www.naturindeks.no; www.hjorteveilt.no

*Of which 47% hinds or hind calves. No sex ratio data Scotland.
Artisanal products
“Farming (landbruk) has historically always devoted itself to value creation from all available natural resources” - Per Skorge, Secretary General Norwegian Farmer’s Association, 2017.
• Value creation in Highlands & Islands ‘landbruk’, including crofting, is based on the biological productivity of the land.
• That land is currently performing well below its potential productivity, biologically and therefore economically.
• It is in the interests of crofters, of the wider community, and of the Scottish Government (even construed in the narrowest economic terms) that a change to a landscape which is producing at its potential, happens.
• Woodlands of the type exploited in multiple ways by farmers in Norway, are the key element in achieving greater sustained productivity from the Highlands & Islands landscape.
• SW Norway provides many ‘worked examples’ of how this change happened, how it is maintained, and how it is used.
• It also shows that assertions that ‘it can’t be done’ are untrue. SW Norway has done it. Not doing it in the Highlands & Islands is therefore a choice.
• None of which is to suggest Scotland should just copy Norway. Both landscapes are ‘cultural landscapes’, and have been for millennia, in which practice and policy have been, and are now, strong shapers (intentionally or otherwise) of what happens.
• But Norway provides insights which can be drawn on for moving to, and value creation in, a more productive Highlands & Islands landscape.