



**Northern
Cereals**



**Northern Periphery and
Arctic Programme**
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Northern Periphery and Arctic Programme
Northern Cereals – New Markets for a Changing Environment

Norway – Sustainability review

Deliverable T2.3.2

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LCA “Northern Cereals”- Norway

The greenhouse effect has been an issue since the 1980s, and the traditional way to address environmental challenges has been to focus on single processes or pollutant. In later years, concepts like “the green shift”, circular economy and the shift to the bioeconomy all turn the focus to a more holistic approach. LCA (Life cycle assessment) is a technique to assess environmental impacts associated with all the stages of a product's life cycle. Carbon footprints are now increasingly being included in the marketing of products, and politicians are discussing labelling food products with their total life cycle CO₂ emission. CO₂ emission from agriculture has been a big issue in Norway, especially concerning meat production. The biggest concerns has been towards production on marsh-land, plowing, manure handling, agronomy in general, imported concentrates, non-grazing animals, the extensive use of plastic for grass conservation as well as transportation.

In Balsfjord municipality in Troms County in Northern – Norway a project called “Klimatiltak på gården” was reported on in 2016 (Kvaal, 2016). Balsfjord municipality is one of the largest agricultural-municipalities in Northern-Norway with about 150 active farms, both including forestry and agricultural production. The project showed that all these farms combined are considered CO₂-neutral since the forestry binds about the same amount of CO₂ that the agriculture produces. However, increased forestry production that will further enhance the carbon sequestration and improved agricultural practices can contribute to more positive carbon footprints. The largest source of greenhouse gas emission within crop production is from production on marsh-land, even though new agricultural land is no longer established on marsh land. Good agronomy in general will reduce the emissions.

LCA analysis has been performed in some value-chains of food products. Korsæet et al. (2013) performed an LCA of bread made of Norwegian raw materials. They quantified the impacts of growing barley, oats, winter and spring wheat on 93 farms representative for the main cereal production area in Norway. Thereafter they assessed a representative production chain for bread, including transport, milling, baking and packaging processes. Their findings showed that 50 % of the environmental impacts from bread production came from on-farm processes. In total the GWP (global warming potential) per kg bread was 0.95 kg CO₂-equivalents.

In general a lot is going on in Norway to reduce the CO₂ emission from the agricultural sector. Now all the farmers' organizations are collaborating in a three year project called. Klimasmart landbruk: <https://klimasmartlandbruk.no/100-losninger/>.

As a model farm, Thorvalseyri farm in Iceland can function as an inspiration also for farmers in Northern-Norway. Olafur Eggertson and his wife Guðný, were therefore invited to speak at the “Hurtigruteseminar”, which is a yearly meeting place for North-Norwegian farmers, researchers, advisers and public employees concerned with agriculture. Within the project “Northern Cereals”, we are planning to bring farmers from Northern-Norway to Iceland in connection to the projects end seminar in March 2018, with the aim to learn more and get inspiration from the Icelandic farmers, especially from the Thorvaldseyri farm.

The length of the growing season and the climatic conditions are relatively similar in Iceland and Northern-Norway and it is therefore interesting to compare the agricultural system in these two countries. As in many European countries, there has been a reduction in number of farms in Northern-Norway the last years. There was about 28% reduction in number of farms in N-Norway from 2003-2012 (Eldby & Fjellhammer, 2014). Some of the remaining farms grow in size and renting of land becomes more common. This is especially challenging in N-Norway since each farmland is small in size and there are long distances between farms. An average farmer in Troms County is harvesting grass from 6 farmlands (Eldby, 2016) which cause higher CO₂ emission because of extensive driving and transport of machinery.

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