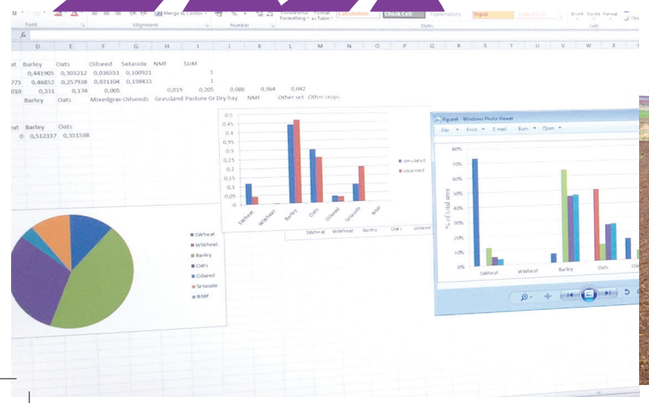
Economic sustainability

We will model the economic sustainability of the pilot farms.

We will apply an economic crop rotation model to some pilot farms included in the OPAL-Life project. Its aim is to produce as high and stable financial results from production as possible.

The model takes into account crop rotation, nitrogen fertilization, plant protection and liming of different field parcels, including yields and costs. In addition to income, the model produces rough estimates of greenhouse gases, nutrient balances and nutrient leaching.

Furthermore, the model produces a financially optimized crop rotation plan for farms for up to 30 years, and it is suitable for comparing different optional decisions.



Greenhouse gas emissions

In OPAL-Life project, we will monitor the greenhouse gas emissions of different types of farmland by means of field experiments.

We will, for example, measure nitrous oxide emissions, biomass yields and the amount of plant residues.

Using field tests, we can verify modelled results. In addition to measurements, we will model greenhouse gas emissions and soil carbon pools in cultivation, on ecological area and in afforestation.

We will also seek climate-smart forms of land use for land becoming free due to intensified production. We will also make a national estimate of emission reductions that can be achieved by intensifying plant production on the best parcels.

Follow OPAL

OPAL-Life (2015-2020) is a project funded by the EU and coordinated by the Natural Resources Institute Finland (Luke). The aim of the project is to mitigate greenhouse gas emissions from agriculture following the principle of sustainable intensification.

(LIFE14 CCM/FI/000254).

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OPAL·Life

Optimising agricultural land use to mitigate climate change

Biodiversity

We will examine the impact of land use on biodiversity with regard to birds and game animals on the basis of existing material.

Any changes in bird species and nesting density are highly applicable to monitoring any changes in land use. Birds mainly react quickly to any changes in their living environment, and information about bird stocks is widely available.

We will monitor the frequency of species in relation to land use on the pilot farms. In addition, we will evaluate the impact of land use on biodiversity on a national level using various future scenarios.

Land use optimisation

In sustainable intensification, resources are allocated to field parcels having high yielding capacity, while production is shifted away from poorly performing land.

Agricultural production intensified in an environmentally, economically and socially sustainable way is a means to reduce yield gaps on land with a high yield potential and expand non-responsive or distant field parcels, for example, to green fallows, buffer zones, nature managed fields or game fields. This is a means to mitigate climate change, as the area of the intensively tilled farmland decreases and the area with a permanent crop cover increases. This also diversifies agricultural landscapes.

In this project, we develop a land use optimization tool to support farmers' decision making towards a more cost-efficient and environmentally friendly farming systems.

Land use optimisation tool

The tool helps farmers to decide what is the most profitable use of each field parcel in the future.

The map illustrates field parcels that have first been scored according to their characteristics and thereafter allocated to either sustainably intensified, extensified or afforested.

The optimization tool helps farmers:

- to plan the use of their field parcels
- to allocate adaptation measures needed to cope with climate change
- to safeguard environmental benefits, especially diversity of the agricultural landscapes and mitigation of greenhouse gas emissions
- to set sale and lease prices for farmland, as the tool provides a reference of how good each parcel is compared with the other parcels in the region
- to improve farm profitability through optimized usage of resources on the basis of field characteristics.

Social acceptability

In general, social acceptability can be described as how well the goals and actions respond to the values and appreciations of citizens.

In the OPAL-Life project, we are primarily interested in farmers' views concerning land use optimization principles, sustainable intensification practices and climate change. However, we also explore the views of a larger public in Finland concerning the future paths of agriculture.

Social acceptance is a key dimension for all actions in the OPAL-Life project, and we will work closely with farmers. We will collect information directly from 20 pilot farms, use in-depth interviews, surveys and crowdsourcing to create interaction.