

## 17. The role of aquaculture in circular food systems in Europe

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In the coming decades, humanity will face the challenge of feeding the world's growing population whilst staying within planetary boundaries. Realising the current food system transgresses many planetary boundaries, a promising way forward is to build circular food systems. In circular food systems, biomass from arable land and water bodies is prioritised for human food and other basic needs, and not for animal feed. Along this paradigm, farm animals, including aquaculture species, should not consume human edible biomass but instead convert by-products from crops, livestock, and fisheries that are inedible for humans, into edible biomass.

Previous research has primarily focused on livestock. Whilst aquaculture can play an important role in a circular food system because they have an important role in the human diet (e.g., fatty acids) and aquaculture has additional benefits to livestock in the upcycling of by-products. A unique characteristic of aquaculture, is that there are many species cultivated over a wide range of trophic levels, and that they are kept in a variety of housing systems. The variety of species cultivated and variety of production systems is expected to fulfil different roles in circular food systems.

The aim of this current project is to determine the role of aquaculture in circular food systems. We will use circular food system modelling to gain insights into what aquaculture species could be kept in which aquaculture systems, how much aquatic food could be produced and what by-products could be recycled as fish feed.