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1s4 Towards circular marine food production | Sustainable mariculture

Potential for carbon sequestration by using shells from aquaculture as building material

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Shellfish are advocated for as a feasible option for a nutrient efficient protein source. Further exploitation for human application requires embedment in a circular designed food system, especially the application and embedment of the contributions of carbon and nutrients. The shells, that often are considered a waste product could be used as source of calcium carbonate that is essential in concrete and traditionally collected by mining. In a running project we investigate the applicability of shells from aquaculture in building material. The application of shells in building constructions holds the advantage that the included carbon is sequestered for a longer time. To assess this potential we mapped out the carbon fluxes of marine shellfish. It is clear that with shells carbon can be extracted. However depending on the approach chosen for the calculation, shellfish can either be considered a sink or a source for oceanic CO₂. The different approaches will be presented and discussed, and we will show that using shells as construction material can help in extracting CO₂ from the carbon cycle. Crucial success factors and criteria for this application will be explored to determine the match and mismatch of carbon inclusive sectors, at a local and broader scale.

Keywords: shellfish mariculture, waste , carbon cycle, concrete