AQUA-LIT

PLAYERS AT PLAY

COUNTRY PROFILE: GERMANY

This project has received funding from the European Union's EASME-EMFF funding programme under grant agreement EASME/EMFF/2017/1.2.1.12/S2/04/S12.789391.

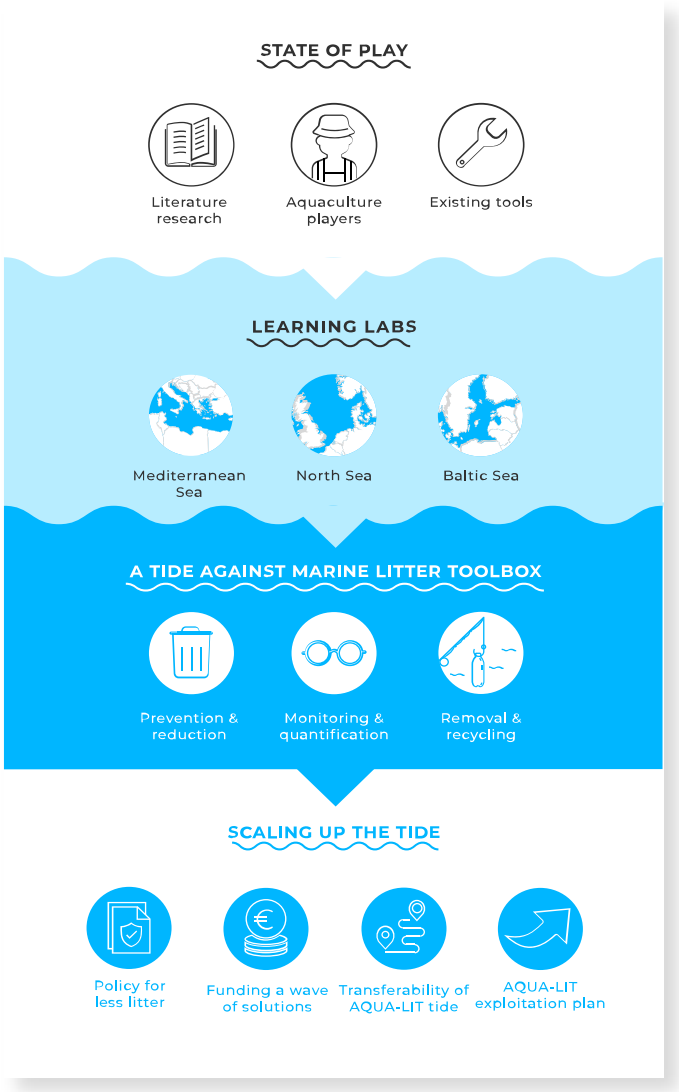
AQUA-LIT project

AQUA-LIT is an EASME-EMFF funded project that aims at providing the aquaculture sector with a sustainable **toolbox** of innovative ideas and methodologies to address the 3 main components of marine littering: **prevention & reduction, monitoring & quantification, and removal & recycling.**

To fulfill this mission, we will be working face-to-face with aquaculture farmers in three **regional Learning Labs**: at the **Mediterranean basin, the North Sea and the Baltic Sea regions.** In parallel, we will identify and cluster existing, upcoming and already implemented tools on marine littering, and we will further **develop a platform and an app** for providing the **'Tide against marine litter toolbox'.**

Lastly, we will **'scale up the tide'** by developing the '**policy for less litter'** set of recommendations, by showcasing the **'funding a wave of solutions'** available for the sector and by coming up with a **transferability plan for outermost regions.**

Through this, we expect to help all stakeholders from the aquaculture chain to increase the understanding, awareness and availability of solutions, so a potential **transformation of the aquaculture sector towards a less polluting sector** can become possible.



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Project Consortium

Geonardo Environmental Technologies **(GEO)**

European Centre for Information on Marine Science and Technology **(EurOcean)**

Vlaams Instituut voor de Zee -Flanders Marine Institute- **(VLIZ)**

Sustainable Projects GmbH **(s.Pro)**

Instituto Español de Oceanografía -Spanish Institute of Oceanography- **(IEO)**

Société d'Exploitation du Centre National de la Mer - French National Sea Centre in Boulogne-sur-Mer- **(Nausicaa)**

Fundo Regional para a Ciência e Tecnologia -Regional Fund for Science and Technology- **(FRCT)**

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AQUA-LIT country profiles

The AQUA-LIT country profiles present a description of the different aquaculture stakeholders, categorised by the four different stages in the life cycle of an aquaculture farm: 1) Initiation, 2) Development, 3) Operation and 4) End of life.

The country profiles were compiled for the two most extensively studied countries in each of the three sea basins of the AQUA-LIT project: Italy and Spain in the Mediterranean Sea, Belgium and France in the North Sea and Denmark and Germany in the Baltic Sea.

The country profiles resulted from various stakeholder engagement processes carried out during the project: the interactive workshops as well as individual stakeholder interviews. More information on the contributions from the aquaculture stakeholders can be found in the Learning Lab reports of the Mediterranean Sea, the North Sea and the Baltic Sea.

The country profiles can also be consulted in the annex of the Knowledge Wave on Marine Litter from Aquaculture Sources.

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GERMANY

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Over the last ten years, fish production from aquaculture facilities has remained constant in terms of production volume with the amount of marketable size fish and shellfish running at approximately 40 000–50 000 tonnes produced per annum. The main reasons for this stagnation has been the high costs for energy and labour, restrictions in terms of environmental and animal protection, a shift of consumer preferences away from species like carp (produced in German aquaculture facilities) towards other species (like salmon imported from Norway) and cheap imports from abroad (carp, trout, salmon). Although a number of technical and biotechnological solutions and developments also in mariculture systems have had a positive impact on aquaculture, the above-mentioned restrictions have however prevented a significant growth in production volumes. Even mussel farming which is considered to be an extensive, environmentally friendly farming activity, faces increasing regulatory difficulties that will not allow its expansion despite the fact that the demand for aquatic products is continuously increasing.[18] This is also true for approaches, which offer compensation schemes to farmers for their service to reduce nutrients in those areas with high eutrophication. In all Natura 2000 sites in the German Baltic EEZ marine aquaculture is not allowed. Aquaculture is seen as reason to possibly miss the Good Environmental Status (GES) according to the EU Marine Strategy Framework Directive until 2020. If no compromise is found, these areas cannot be used for aquaculture.

Initiation

Bodies approving the aquaculture technology (classification bodies)

In Germany, building law is the main vehicle for application of approval for a new production. It involves all other legal areas - environmental, fisheries, veterinary, water, animal production etc. The competent authority is located at the lowest regional level (district level, one level above city/municipality). In approval practice in Germany, there is a clear distinction between extensive and intensive production that is respected by most authorities, but only considered as guidance, not a legal obligation. The difference determines the mandatory use of certain aspects of Best Available Technologies (BAT), e.g. particle removal, not waste removal) and self-monitoring. Even though Environmental Impact Assessment (EIA) law is a federal law affecting the whole country, the individual states are free to determine other cut-off values, further increasing the possible establishment of a disharmonious system.

The legal system for new license application lacks a carrying vehicle mechanism, i.e. all the different legal fields act independently. Building and veterinary approvals are governed on a regional level and with moderate fast processing times (in best case), whereas environmental permission is mostly affiliated with the regional or national government, inflicting long processing times of up to 2 years (typical EIA). Water intake permits are limited in their

[18] COFAD (2017): Perspectives for a German Aquaculture in respect to international competition. Final report, see: https://www.ble.de/SharedDocs/Downloads/DE/Projektfoerderung/Innovationen/PerspektivstudieAquakultur-lang.pdf?__blob=publicationFile&v=2

duration, sometimes only issued on a yearly basis, which results in a recurring threat of continuity of the business, not to mention the administrative burden involved in this rather unusual practice.

For mussel cultivation in German Baltic coastal waters, at least four permissions are required.[19] The permission procedure mainly depends on the decision of a farmer whether the mussel product is for food, feed or as contribution to nutrient cycling in IMTA systems (as compensation schemes). For example, mussels for human consumption need to be produced in a mussel production area that need to be evaluated for at least 12 months in a sanitary survey, which may be very cost intensive.[20] Also important for the permission procedure is the decision whether more or less technique is used for production, e.g. smartfarm, longline (surface or submerged), raft, bottom farming; in addition the dimension, processing and location has an influence.

Mussel farmers for food production need, for example, the following permits by several different authorities in their relevant federal coastal state (Schleswig-Holstein, Lower Saxony or Mecklenburg-Western Pomerania) and by national ministries:

- Shipping Police Permit
- Fisheries Permit
- Coastal Protection Installation Evaluation
- Aquatic Animal Disease Permit
- Mussel Production Area Classification
- Appropriate Assessment
- Biotope Protection Assessment
- Species Protection Assessment
- Impact Assessment
- Organic Production Certification.[21]

So far, any impact or risk assessments are not considering the loss of plastic material and gear. However, the risk assessment demands the description and evaluation of potential farm damage / accident, expected user conflicts and measures to avoid these conflicts, and risk evaluation for sea ice appearance. Some authorities are starting to ask for potential measures to reduce the input of plastic litter into the marine environment.

To keep costs in case of severe damages on a pragmatic level, all aquaculture farmers have to be members in an employers' liability insurance association (Berufsgenossenschaft (BG)).

Under the EMFF funding can be provided to support the permission process. However, the application process is seen by many German aquaculture farmers as too complicated and therefore not often used. Instead, they are often using all-inclusive packages offered by spezialised companies or consultancies in case they are not applying by themselves.

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[19] https://www.submariner-network.eu/images/BBG_GoA52_Manual_Legislation_20190423-2.pdf

[20] Required by EU Hygiene package. Mussel production areas are required in all EU Member States for food mussel production

[21] see: https://www.submariner-network.eu/images/BBG_GoA52_Manual_Legislation_20190423-2.pdf

Aquaculture installations & system designing & engineering companies

The aquaculture sector in Germany employs an estimated 1.200 full-time equivalents in primary production, but presumably, another 20.000 producers are active on a part- time basis. The full picture of the German sector only becomes apparent when looking up and down the full supply chain. Large German enterprises are vertically integrated in international "big names" of the sector, ranging from production of feed and additives to genetics, health and trade. Germany has a vibrant scene of entrepreneurship and start-up support in adjacent fields of agri-food, biotech, design and engineering. German research organizations and universities have a high reputation in research, development and innovation worldwide.

In Germany (as well as in other EU countries like in Poland or UK), the utilization of updated documentation of Best Available Technologies (BAT) are considered the most efficient tool when communicating with the respective authority. Often, a municipal or communal authority has only very limited experience in dealing with aquaculture. In Germany, these documents are less frequently updated and are developed by aquaculture experts from state authorities, typically state-driven research institutions, in close connection with producers and other experienced stakeholders. Therefore, these BAT documents have the highest effectiveness and impact when they are formulated by practitioners and other experts (including scientists), when they are publicly available and visually appealing and are also regularly referenced in other contexts (e.g. as an industry standard in a marketing context) as well as being living documents, i.e. under regular review.

Some companies offer to accompany the whole life-cycle process of an aquaculture system, some are focusing on specific steps or offering biological and genetic services related to fish and mussel breeding. The following companies specialised in planning, designing and installing systems and therefore employ biologists, technical and engineering specialists:

Water Proved[22], located in the Southern part of Germany, is designing and building fish farms for a large variety of species: Trout, Salmon, Char, Pike Perch, Sturgeon, Shrimp, Tilapia, Perch, Carp, etc. Depending on the site conditions they develop a farm as Flow Through or Recirculating Aquaculture System (RAS) or marine net system; they also help with modernization or modification of an existing farm, including new, more sustainable materials.

Besides engineering and construction of farms, they sell lots of components for the aquaculture business: Drumfilter, biological filter, oxygenation, pumps, UV disinfection, monitoring and control systems, feeding systems, fish pumps and more.

UFT – Aquaculture Engineering GmbH[23] is offering all stages of an aquaculture plant, be it onshore as RAS system or offshore: starting from consulting, advisory and feasibility check, it plans and is doing the approval process, followed by the execution like construction, controlling the mechanical installations and procurement management and finally the optimization, including the installation of remote monitoring systems. The company is also giving advice related to the decomissing process of an old aquaculture plant and is contacting potetntial recyling or incineration companies.

[22] www.water-proved.de/en/
[23] http://uftaqua.de/en/

Apart from these, several small companies are able to support aquaculture farmers at specific steps of the process. Some are also starting to test cooperation with universities, like the University of Halle, which is doing material research, focusing on sustainable, recyclable and durable materials for plants.

Authorities approving the aquaculture farm (i.e. public authorities)

Germany is a federal state with a three-tiered system of government: the federation (national level), the Länder (federal states, provinces, or regional level), and municipalities (local level). The fisheries laws are executed by the Länder as in principle, according to the constitution, the federal laws and regulations are executed by the administration of the Länder . In terms of the legislative power at the federal level, the federal state can enact laws on sea and coastal fisheries within the so-called "concurrent legislation", whereas the *Länder* are exclusively responsible for national inland water fisheries. Therefore fishery acts exist both at the federal level, including provisions on sea and coastal fisheries (*Seefischereigesetz- SeeFischG*) and at the Länder level with provisions on inland water fisheries and territorial waters (within 12 sm zone). None of the fisheries laws (*Fischereigesetz- FischereiG*) of the sixteen Länder include explicitly the term aquaculture.

Due to the lack of a national aquaculture law, there is no single authority responsible for aquaculture. Several authorities are concerned with aquaculture matters, such as the authorities in charge of water management, nature protection or construction. The most important authorities with respect to aquaculture are the water authorities. The Federal Ministry of Consumer Protection, Food and Agriculture (Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft – BMVEL) is the competent authority on fisheries and aquaculture at the federal level. It drafts policies, guidelines and promotes actions especially at the EU level in this area, for example on the subject matter of the introduction of a environmental label for fishery products. The BMVEL ensures that the production of freshwater and seawater fish strictly respects environmental sustainability and the priority of consumer protection. The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit – BMU) deals with the following tasks relevant to aquaculture: protection of inland waters and the maritime zones, groundwater protection, wastewater treatment, pollutant in food and landscape planning. For offshore installation permits the Federal Maritime and Hydrographic Agency (BSH) is responsible.

Development

Those constructing, bringing, assembling the farm

There are a few German companies who are offering specialized services for the construction, installation of structures, submarine cables, foundations and platforms.

Agravis Raiffeisen AG[24] is active in the segments plant production, machinery, construction, retailing and energy. The company is focusing on sustainable new construction and refurbishment of plants as well as underwater construction applications. Under the brand Pescavis AGRAVIS Raiffeisen AG recently entered the aquacultural feed market.

For eight decades, the ARTHUR KRÜGER company[25] has gained expertise in the complex field of plastics applications. As a producer and service provider, they combine state-of-the-art technologies and technical expertise with the best craftsmanship and the power of a family-owned company. They provide services for customers from various industries, including a wide range of semi-finished products from well-known brand manufacturers with customized cutting services, as well as complete manufacturing of finished parts for the aquaculture sector: from design to construction up to assembly with glass-fiber-reinforced plastic (GRP) construction, GRP with UV-, chemical- and corrosion resistance, non-conductive, slip resistant (R13), light weight, stable, sustainable, 100% recyclable, easy to install und long life – perfect material for hydraulic engineering supplier for any kind of plastic applications, even for rough weather conditions at sea.

Erwin Sander GmbH[26] works on the basis of an all-inclusive service, looking for solutions oriented to the demands of the application, taking into account operational, as well as commercial, logistic and administrative aspects. The service portfolio includes construction management and engineering, complete pipe and tank work, system installation, initial start-up, and maintenance. The service portfolio includes construction management and engineering, complete pipe and tank work, system installation, initial start-up, and maintenance. Sander products are installed all over Europe, as well as in the Americas, Africa, Asia and Oceania.

Water-Proved GmbH[27] design and build fish farms for a large variety of species: Salmon, Trout, Pike Perch, Sturgeon, Shrimp, Tilapia, Perch, etc. Depending on the site conditions they develop - besides engineering and construction of farms - lots of components for the aquaculture business.

Operation

Aquaculture producers and operators

The German aquaculture sector is very diverse, ranging from extensive cultivation systems in ponds and coastlines to intense indoor farming. The annual aquaculture production of fish and mussels accounts for approximately 33,000 tonnes. The main finfish species are common carp and other cyprinids produced in warm water ponds and rainbow trout and other salmonids

[24] www.agravis.de
[25] www.arthur-krueger.de/en
[26] www.aqua-sander.de
[27] www.water-proved.de/en/

produced in flow-through and raceways systems. Other freshwater species encompass sturgeon, catfish, eel, pikeperch and perch. Marine aquaculture in Germany almost exclusively entails the production of blue mussels and oysters in the North Sea and Baltic Sea, as well as a handful of high-tech RAS facilities producing tropical shrimp and marine finfish for high-end markets. Marine and freshwater microalgae and macro-algae are being cultivated by at least 10 companies throughout the country.[28]

In the German Baltic Sea two marine net-installations exist in the coastal waters at Nienhagen and Kieler Förde with mainly direct marketing of the salmon trout and other finfish.

Offshore-aquaculture plants outside the coastal areas, like in the EEZ do not exist, however opportunities are currently researched.

The production of blue mussels takes place in the Flensburger Förde and the catch of young mussels for mussel cultivation at different places along the German Baltic Sea coastline.

Pilot projects

- In the Cluster of Excellence „The Future Ocean“ at Kiel University (Germany) there is one focus on the topic of „sustainable aquaculture“. Researchers from the fields of biology, agricultural sciences, philosophy and social sciences have teamed up with experts and operators from politics, industry and associations with the goal of bringing the potential and the challenges of sustainable aquaculture to a wide audience, from public, industry and politics. Strong partners of the cluster are KNAG and GMA.
- The aim of the following three projects was to develop criteria for the location selection of offshore aquaculture plants in synergy with offshore wind turbines and at the same time to develop technical and sustainable solutions for marine aquaculture installations, including the prevention of losses of debris. Since in German marine areas separate planning of aquaculture plants is hardly permitted, a multi-use concept may be the solution:
    - Open Ocean Multi-Use Project (OOMU) of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU),
    - Offshore Site Selection Project for sustainable and multi-functional use of heavily used marine areas in the North and Baltic Sea (OOS), supported by the BMEL
    - TROPOS Project, analysing multi-use offshore platforms, also with respect to share energy and other resources, financed by the 7th Framework Programme for Research and Development (EU).
- Baltic Aqua Mussels project analyses in the Kiel Fjord the robustness of mussels related to changed conditions due to climate change: in experiments, they coped amazingly well with increasing carbon dioxide levels - unlike their counterparts before Sylt.[29] In addition, the project aims to find ways of proofing offshore aquaculture systems as being free of marine litter losses.

Further projects also focusing on circular economy approaches and aquaculture (apart from many other topics):

- Baltic Blue Biotech Alliance The "BBA Baltic Blue Biotechnology Alliance" (Interreg 01.03.2016 - 28.02.2019) is a joint concept by experts from the marine biotechnology / blue

[28] https://www.kesla.de/wp-content/uploads/20180810_RZ_A5_Broschuere_AQUA_Montpellier_klein.pdf
[29] https://www.spiegel.de/wissenschaft/natur/kieler-foerde-miesmuscheln-trotzen-der-sauren-ostsee-a-1145000.html

biotechnology of the Baltic Sea Region (BSR) to improve innovative products from marine organisms and develop faster. The international consortium, in which BioCon Valley partners from Denmark, Poland, Lithuania, Sweden, Finland, Latvia and Estonia are involved, is led by the GEOMAR - Helmholtz Center for Ocean Research Kiel.

- InnoAquaTech was developing innovative and sustainable aquaculture technologies in the South Baltic area (Interreg South Baltic). The aim of the project (2016 - 2019) was to further transfer knowledge in the area and involved partners from science and business in Denmark, Germany, Lithuania and Poland. BioCon Valley, the University of Rostock, Garnelenfarm Grevesmühlen, Hanseatische Umwelt CAM, the Institut für Marine Biotechnologie e.V. and the Wirtschaftsfördergesellschaft Vorpommern mbH (association to support economy) are German partners.
- GRASS project[30] aims to raise awareness and build capacity on macroalgae cultivation, harvesting and use among public authorities and other relevant stakeholders across the region. Public authorities, ministries, planning regions and counties play a crucial role in promoting macroalgae as they are the main legislative bodies that also control much of national and regional funding.

Associations representing aquaculture producers and operators

The Federal Aquaculture Association has an exclusive focus on aquaculture. The foundation as an independent interest group took place in 2011 with the aim of promoting innovative, competitive products as well as their sustainable production and successful marketing. The members include companies from the generation, use and marketing of the above-mentioned objectives. The focus of this association is technical aquaculture and systems such as circulatory systems; traditionally shaped sectors of aquaculture are less represented in it.

Below the federal level, a number of other structures of self-organization have been established at the state level, most of which have regional or local links (e.g. state associations, clubs, pond cooperatives etc.) and bundle activities in the state (eg stocking). Networks, some of which were formed with the support of the state and are therefore only partially assigned to the "self-organization" category, are used for the exchange of information and the formation of practical, event-related cooperation. Examples of this are the "Aquaculture in Mecklenburg-Western Pomerania" network.

Another is the "Aquaculture Competence Network" (Kompetenznetzwerk Aquakultur KNAQ) set up in May 2016 which networks partners, public relations, technology transfer and also supports the sustainable development of aquaculture as a core task: it is the supportive stakeholder network for the aquaculture competence centre of the federal state Schleswig-Holstein, the most northern federal state of Germany. KNAQ is a project coordinated by the Chamber of Agriculture of the federal state Schleswig-Holstein. It provides structural support and individual consultancy for the development of aquaculture in Schleswig-Holstein based on our development strategy.

The competence centre is the umbrella under which the leading research and development institutions of Schleswig-Holstein have joined forces to promote scientific excellence and the development of cutting edge technology in the field of aquaculture. As an outcome of this

[30] https://www.submariner-network.eu/grass

initiative, the Association for Marine Aquaculture (Gesellschaft für Marine Aquakultur, GMA) in Büsum (www.gma-buesum.de) was founded and a professorship for marine aquaculture was installed at the Kiel University (www.uni-kiel.de).[31]

The Competence Network Aquaculture currently combines the expertise of approx. 1.000 individuals from all across Germany and abroad. These network members are affiliated with 457 different institutions, specifically 279 companies (mostly SMEs), 75 research organizations and universities and 103 other, e.g. NGOs.

A proven cooperation is often the cooperation between practical aquaculture companies and the institutes or institutions for applied research (LfL / Institute for Fisheries Starnberg, Fisheries Research Center Langenargen, State Research Center for Agriculture and Fisheries Mecklenburg-Western Pomerania, Institute for Inland Fisheries Potsdam-Sacrow, Saxon Lan - all for environment, agriculture and geology - department for fisheries, etc.). The exchange with other governmental (advisory) agencies (e.g. LWK) is also perceived as advantageous and actively used. Self-organization of the sector and state support structures are closely networked here.

Aquaculture maintenance and monitoring

According to the HELCOM Recommendation on sustainable aquaculture in the BSR[32] and federal nature conservation law, the aquaculture farmer is requested to regularly monitor the eutrophication staturs, oxygen depletion or the state of the sediments in the affected area; here the fisheries or nature conservation agencies of the coastal German states are providing support. There is so far no need to monitor the loss of plastic items of a plant, although committments for farmers are under discussion to proof the input-output balance of an installation.

Often, the aquaculture farmer is outsourcing the maintenance and monitoring services to specialized companies. Someof these German companies are working worldwide, some are focusing on the European or Central European market. There exist around 6 companies which offer maintenance services in Germany, two of them are:

Water-Proved GmbH[33] offers, besides engineering and construction of farms, monitoring and control systems, as well as the service of applying these monitoring systems and do maintenance on a regular basis.

Sander[34] works on the basis of a complete service, looking for solutions oriented to the demands of the application, taking into account operational, as well as commercial, logistic and administrative aspects. The service portfolio includes construction management and engineering, complete pipe and tank work, system installation, initial start-up, and maintenance.

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[31] https://www.kesla.de/wp-content/uploads/20180810_RZ_A5_Broschuere_AQUA_Montpellier_klein.pdf
[32] HELCOM Recommendation 37/3
[33] www.water-proved.de/en/
[34] www.aqua-sander.de

End of life

Those dismantling the farm installation

According to German law (building law, nature protection law) companies responsible for installing aquaculture systems are obliged to decommission them and bring them back to land as soon as the aquaculture installation is too old to keep it in the water. This is also true for pilot project initatives which have to take care for the dismantling after the project duration. Project budget should be allocated for these activities.

As for succesful restoration projects, biological structures (e.g. oyster reefs) can be left in place if a permit was approved. Standardized decommissioning plans for the aquaculture sector, like they exist for ships/vessels decommissioning do not exist in Germany.

Those managing/governing the waste management

In Germany, the core elements of the circular economy are set out in the Circular Economy Act (KrWG), which entered into force on 1 June 2012. The Act transposes the Waste Framework Directive into national law, and outlines the legal basis and fundamental principles of the circular economy. Beginning with the legal definition of waste, in particular, these core principles include the polluter- pays principle, the waste hierarchy, and the principle of shared public and private responsibility for waste management. The purpose of this Act is to promote the circular economy to conserve natural resources, and protect human health and the environment from the impacts associated with waste generation and management.[35]

For demonstration projects as well as for real aquaculture installations, offshore workers are expected to bring the materials and equipment used back on land, including other waste items that they come across at sea.

Every port has a waste management plan. According to the Port Reception Facilities for the delivery of waste from ships Directive[36], offshore installations are one of the sea-based sources of marine litter. For that reason, Germany has to adopt measures as appropriate on waste delivery from offshore installations flying their flag or operating in their waters, or both, and ensure compliance with the stringent discharge norms applicable to offshore installations laid down in the MARPOL Convention, Annex V. Based on the work of the German Round Table on Marine Litter[37], strategies for managing waste derived from ships have been outlined, including first ideas for aquaculture waste. It is planned to elaborate on these initatives and incorporate approaches into port's waste systems.

[35] https://www.hel-x.eu/en/home/
https://www.bmu.de/fileadmin/Daten_BMU/Pools/Broschueren/abfallwirtschaft_2018_en_bf.pdf
[36] amending Directive 2010/65/EU and repealing Directive 2000/59/EC
[37] https://muell-im-meer.de/sites/default/files/2019-08/Zwischenbericht%20RT%20Meeresmuell_Internet.pdf

Those processing the waste/ collection/ clean-up

Examples for processing companies who are also open to recycle items coming from the aquaculture and fisheries sector are:

The Christian Stöhr CmbH & Co.KG[38] have more than 50 years of experience in plastic processing, exclusively at their site in Germany using a method that they developed, in strict compliance with high quality and environmental standards. Their processing system is used by many owners of aquaculture and biogas plants.

Bork Management UG (limited liability) offers comprehensive services relating to plastics recycling. The main focus is on recycling in European end plants, with whom they maintain long-standing, cooperative relationships. Together with these recycling partners, Bork Management UG prepares concepts and strategies to develop solutions for professional and cost-optimised recycling of plastic waste, including plastics derived from aquaculture like big bags, nets, ponds, installations, agglomerates, ground materials and compounds.[39]

ALBA Group[40] has developed a new cascade extrusion system COREMA®, which makes it possible for the first time to produce tailor-made recycling compounds for particularly high-quality applications in just one process step. With this we reach a new stage of development in plastics recycling. We use the new technology as part of our multi-award-winning process Recycled Resource. Comparable to the compounding of new goods, additives, modifiers and inorganic fillers can now be added in the production process in proportions of 0.25 to 40 %. The quality control of the material rheology takes place digitally and in real time. Not only the quality of the recyclates, but also the environmental performance is further improved with the system. Compared to the use of new granules from crude oil, the COREMA system can save up to 50 % of greenhouse gas emissions even when producing complicated recipes.

The Danish recycling company Plastix has developed a Europe-wide Collection and Supply System (CSS), CuxTrawl[41] has set up a collection point for old networks in Cuxhaven. CuxTrawl and the fishermen/aquaculture farmers do not incur any costs through the cooperation with Plastix. Rather, Plastix has introduced a certification programme for suppliers based on multiple requests. The programme offers bronze, silver or gold certificates and enables suppliers to market their environmental efforts. The label documents CO_2 emissions savings as well as efforts to reduce landfill sites, to reduce equipment lost or disposed of at sea and to save valuable resources.

Aquafil Group, originally from Italy, meanwhile represented worldwide, also in Germany is recycling material on a large scale and produces the plastic fiber Econyl; however, the percentage of their network material is unclear but they are open for gear coming from the aquaculture sector as well.[42]

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[38] https://www.hel-x.eu/de/unternehmen/
[39] https://bork-management.com/index.php/en/
[40] https://www.alba.info/unternehmen/anlagentechnik/kunststoffaufbereitungsanlage/
[41] orst-huthsfeldt,-kutterfisch-zentrale-gmbh.html

[42] http://www.aquafil.com/
https://ensia.com/features/fishing-gear-recycling/

KIMO's Fishing for Litter initiative is also active in Germany: One of the goals of this project is the reduction and orderly disposal of garbage in the sea, including nets. The garbage is recorded as by-catch by the fishermen and handed in free of charge in the ports. In addition, data is collected on the composition and sources of marine litter, now starting with litter derived from aquaculture plants as well.[43]

[43] https://www.nabu.de/natur-und-landschaft/aktionen-und-projekte/meere-ohne-plastik/fishing-for-litter/index.html