Pellworm 2040 * Man as a fish

The view of the Wadden Sea from above at low tide is always breathtaking. The solar-powered air taxi glides almost silently over the finely branched sea veins, the tideways, where the sun's rays sparkle like sparks and the shrimp trawlers are still calmly making their way. I notice the new mussel beds and circular algae plants that have recently expanded considerably both in the Wadden Sea in front of the dikes and within the island. Only the small white and black dots on the green dyke, the sheep, are still a familiar sight.

The sea is as smooth as a mirror today, but the weather forecast warns of a rapidly approaching severe storm and possible new flooding of my home island. Such announcements would have caused panic on the island twenty years ago, because Pellworm lies one metre below sea level. For a long time, the dikes protected the island from flooding. Now they can no longer do so. Like the island itself, they have served as an important breakwater off the North Frisian North Sea coast for several years.*1
The strong storm surge of 2033 had washed over Pellworm's sea dikes for the first time, temporarily submerging the entire island by four metres. With wind speeds in gusts of up to 220 kilometres per hour from the northwest, the German Bight had quickly built up within a few days and caused considerable damage in Hamburg and the coasts of North and East Frisia. But the early warning from the weather service had given the residents of Pellworm enough time to get to safety on the decentrally distributed floating life rafts.

Instead of raising the dikes even further at great expense, the German coastal states had decided as early as 2027 to build the novel life rafts throughout the flood-prone North Sea area, thus implementing the so-called flexible response strategy against the unexpectedly rapidly rising sea level. The rescue concept also included the terps on which the old farms have stood six metres above sea level for centuries. Some of them were raised and secured with additional escape rooms. For all lower-lying houses, there are now the life rafts, which float up in case of flooding and are equipped with sufficient shelter and provisions. The idea for this came from the Netherlands, where the strategy of defensive defence against the sea was already adopted at the beginning of the 20th millennium. *2

The taxi now lands on one of the pütten, a water basin in the south of the island near the lighthouse. From here I can easily reach our farm on foot. The traditional thatched roof is still as beautiful as ever, despite the extensive work we have had to do to stabilise it due to the increasing strength of the storms. Thatch is now readily available on the island again. For a long time it was imported from Hungary because it often became too dry on the island due to extensive drainage and was therefore no longer suitable for roof construction. Now it is a much sought-after raw material, especially in the building industry.

Our farm has been a research and conference centre for many years. Here - as on many other farms on the island - international experts meet to exchange ideas on renewable energies, agriculture, nutrition, health and many other topics. For the workshop week now beginning, I have prepared the topic: "Man as a fish - living with water" *3. It is about a new relationship between man and nature in a rapidly changing living environment. Adaptation to changes in nature and a deeper understanding of natural processes have been the focus of our research for many years. Perhaps the long series of global pandemics, the increasing migration flows, and the warlike conflicts in and around Europe have changed our view of nature and of ourselves so profoundly.

It seems we are ready to take a back seat to nature. Flooding has long been commonplace in many parts of Europe, whether by rivers or the sea. For example, on the smaller islands surrounding us, the Halligen, which were never protected by dikes, flooding was part of agricultural management. This is now also true for Pellworm. Because of increasingly frequent extreme weather, from extremely long-lasting droughts to torrential rains, a new type of irrigation and drainage system was therefore developed on the island, with which the high and low water levels can be optimally balanced with the help of wind, solar and hydrogen pumps. The island community was able to make the necessary investments because it has made a name for itself worldwide as a research centre for local adaptation to climate change. Farmers and research communities here have agreed to develop new types of combined land and water management. Salt marshes with a very special salt-resistant flora and fauna have re-emerged within the dikes and have attracted worldwide attention. On a limited scale, however, a novel combination of animal husbandry, grain production, horticulture and the production of algae and seafood became possible, thanks to novel desalination processes and the use of specially developed crops. *4

Tourism experienced an unexpected boom in the years when the flexible response strategy was introduced. The Wadden Sea National Park, founded in the 1980s, and the biosphere reserve that followed later, gained in attractiveness through the flexible response to increasingly unpredictable weather conditions, not only for nature lovers, but especially in the field of applied climate research, education, and flexible protection and development measures in the European and global coastal regions. The combination of unique nature experience and intensive research, a participating marine researcher told me, increasingly blurs the distinction between work and holiday time for her.

The island of Pellworm had already made a name for itself in the 1980s as a pioneer in the field of renewable energies, for example with the construction of Europe's first solar power plant and a contribution to the World's Fair 2000. With a renewable energy producer association founded and financed solely by islanders, Pellworm achieved the status of a CO2 sink just a few years later by completely supplying the island's needs with renewable electrical energy from wind, sun and biogas. The biogas plant was redesigned from scratch after the original subsidy expired. Today, all biogenic waste is converted into electricity and heat. The electricity is used to generate hydrogen, which is now used to operate the ferry, which used to be equipped with diesel engines, emission-free. The island's mobility concept has been rethought; in addition to small electric ferries that use the old tidal creeks and the Beck Stream, car sharing is available to all islanders, as well as an autonomous call-bus system. For longer journeys on the mainland, vehicles powered by electricity and hydrogen are available on the mainland. * 5 Pellworm's pioneering position has been further developed year by year through technical innovations, especially new socio-ecological concepts, such as the establishment of energy, food and research communities and cooperatives, which finance investments and profit distributions, a minimum income for islanders, but also the island's considerable research budget.

Initially, this development was hindered and delayed by various economic and political conflicts of interest. For a long time, many farmers resisted conditions and adjustments that were supposed to serve nature conservation or consideration for the rapidly developing tourism. Necessary changes mostly remained blocked on the party-political stage. External investment in upmarket tourism and rapidly

rising property prices made housing unaffordable for the island's young people, craftsmen and start-ups. * 6 But with the amendment of the Coastal Protection Plan and the implementation of German and European regulations to reduce greenhouse gases in agriculture and new support programmes to protect biodiversity, farmers on the island had to make a demanding transition that is now considered exemplary.

After landing on the water areas of the Pütten, a still unfamiliar sight delights me: the imposing herd of water buffalo. They seem to really feel at home here. Mozarella di Buffalo di mare da norte has now also become a speciality on Pellworm with its special sea-salty flavour. The Rungholt breed of sheep, specially bred for the harsh coastal climate, which at the same time makes the grass on the dykes resistant to storms and delights guests with the salt marsh herb aroma, has also become established on the island. Incidentally, the number of animals now living on the island is down to a quarter of what it was 20 years ago, and the land and water farmers earn many times more than they used to. *7

The new regulatory law and the new subsidy programmes of the federal government and the EU were of great importance in this process. Support for agricultural, forestry or water management production is now only approved if a holistic concept for optimal circular economy, local marketing, and best possible sustainable use of locally available resources has been worked out locally, - and if the applicants from the relevant economic sectors have agreed on close cooperation. Also, building laws no longer allow new construction on cultivable land, or the use of water resources, without a concept for energy-saving conversion and renewal of existing buildings and resources. Approval procedures and funding decisions, however, have been considerably accelerated in return.

Ultimately decisive for the successful transformation of the island economy under increasingly unpredictable climate conditions was the generous EU funding for education and cooperation projects that will apply from 2028 and the flexible use of the various funds within the framework of local projects and investments. Even during the 2022-2027 funding period, the EU Commission and the national states had made adjustments in the funding programmes to enable this flexibility. Thus, the framework conditions for an integrated rural development policy with regard to the strategies of the originally rather non-binding EU Green Deal and the biodiversity strategy had

become considerably more effective in favour of local community projects. *8

On Pellworm, far-reaching forms of cooperation between farmers and energy farmers, tourism, research, fisheries and other trades have thus become possible. There is now enough free time and space for all initiators and stakeholders to work out the respective development projects. The funding goals must be defined and controlled by the community itself, instead of adapting to funding goals that do not make sense on the ground. Whereas for a long time private investors and local councils were rather hostile to each other and blocked each other, now, with the support of mediators, cooperation and communication methods, a sustainable change from competition and demarcation to joint cooperation is possible. It is also helpful that complicated accounting procedures at the funding agencies have been simplified and transparency about different interests and joint solutions have become the basis for negotiations and decisions. This also made it possible that a study by a renowned German research institute * 9 on the island's climate-relevant material cycles - which was still abandoned in 2020 due to a lack of data - was finally carried out a few years later and led to impressive changes in land and water management.

I have now arrived at the farm. The weather is still calm and there is no sign of an approaching storm. The hedges and trees that provide wind protection for the garden have hooked themselves firmly under over the years, or so it looks, because the many storms have caused them to lean at an angle to the east so that the wind can sweep over them. Our thatched roof looks similar, but for static reasons it now offers a little less surface to attack. In the garden, the workshop participants have already made themselves comfortable and prepared a European paella - as they call it - with mussels, crabs, seaweed and the Pellworm rice, which grows particularly well here, thrives in the slightly salty inland waters and binds an astonishing amount of CO2. We let ourselves enjoy it.

Among the course participants are old familiar faces and curious new ones. Our cooperation with the island of Hiiumaa in Estonia goes back to the 1980s, and this time plant breeders from there have come to work on salt-resistant grain varieties and short ripening times. There was once a so-called "wool connection" with Hiiumaa within the framework of the Eco-Islands project, in which Pellworm wool was processed into original "Pellowers" in Hiiumaa. * 10

From Eigg in Scotland, from Plessé in Brittany and from Harlingen in West Frisia have come the "new fishermen on land", a movement that has brought together coastal fishing for coastal protection and a new food movement. Hold on to the land, let the water take its course, stick to the basics is the motto. We need new mussel cultures around Pellworm. Without enough solid mussel beds around the island, the mudflats are moving away from the island faster and faster, and the base of the dike is in danger of slipping. With the support of the Bretons, Pellworm has dedicated itself in recent years to both mussel production and the development of new algae- and seafood-based diets. "Man as fish - living with water" is therefore a good introductory topic to far-reaching economic, historical and philosophical thought processes and development concepts. I am very curious.

Aha, the weather app corrects itself. The storm from the north-west has moved on over Norway and the feared North Sea blockage in the German Bight has failed to materialise. So it remains calm and we can explore the island tomorrow in peace with the hydrogen-powered island barges, which travel via the developed canal systems just like in Friedrichstadt or Amsterdam, quickly on the spot via the barge app, of course.

Has the North Sea lost its menace? No, it is just unstoppable, we have become even more a part of it and it of us. This is also true of the wild geese, which caused the farmers of Pellworm headaches for many years because hundreds of thousands of them gorged themselves on everything that grew on the island for a long time. They are now visiting in much smaller numbers because they have made themselves at home in Siberia, which has become much warmer. Man as fish, man as sheep, man as goose - what exactly distinguishes us from them in terms of life that is constantly changing?

CONCLUSIONS FOR RURAL ACTION

Unused potential

This fiction of Pellworm 2040 builds on already foreseeable real changes of the island and the region of North Friesland, and projects political, economic and social developments into the future. Over the past four decades, the island has amassed an impressive treasure trove of ideas, future scenarios, project proposals, master plans, research projects and development studies, much of which has been implemented, especially in the field of renewable energies. Compared to the existing potential, however, many possible developments have

remained stuck in visions and discussion phases and have been forgotten. Party-political squabbles, insufficient support in planning and overcoming conflicts of interest, and a lack of transparency in decision-making have blocked a considerable part of the implementation of existing creativity and personal commitment.

MORE SPACE AND TIME FOR COMMUNITY SUPPORT

In times of crisis, which urgently require rapid and sustainable change, communication and community spirit is central to necessary adjustments. Rural development interventions need to provide and encourage much more space and time for these processes. There must be more trust than administrative hurdles so that cooperation can prevail over individual competition. Funding criteria must require and verify more collaborative use of locally available resources and knowledge potential to overcome sectoral demarcations and offer new forms of governance and capacity building. All the developmental advances depicted in the fiction, or the preconditions for their implementation, could gain momentum and participation and mobilise investment in research and development through targeted and professional community promotion at local or regional level. The rural development plans and the strategic plans of the EU member states would only have to be adapted accordingly in 2022.

Notes (to be completet/edited)

*1 North Sea Coastal Perspective - North Sea and Baltic Sea Coastal Committee
*2 Leewarden Study adapted flexible response
https://www.faz.net/aktuell/wirtschaft/niederlande-hochwasser-droht-ganze-regionen-zu-fluten-17473722.html
*3 Book title "Man as a fish" Swimming through the English Channel, Husum
*4 Local Seed Pellworm - participatory research www.seeds4all.eu
*5 Data from mudflats and sea
*6 No Syt on Pellworm, Ökoverein De Pellwormer September 2021
*7 Pellworm statistics Sheep meat Pellworm comparative with France pré salé
*8 Critical evaluation Green deal and indication of concept intergrated rural action
*9 Thünen study, article de Pellwormer
*10 Wollonnection, Foula, Eigg

Hannes Lorenzen, December 2021