

THE BATTLE AROUND THE SEA DEFENCE IN THE NETHERLANDS: THE PARADIGM SHIFT FROM SEEING DAMS ONLY AS ICONS OF SAFETY TO DEVELOPING DAMS AND THEIR ENVIRONMENT AS ICONS OF SAFETY AND ENDURABILITY

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INTRODUCTION

After centuries of building dams and dykes for the purpose of safety only in the last two decades there are voices which state we have “gone too far” with the great sea defense dams. The effects on the valuable ecosystem of the Delta, the water quality and the fishery capacity were underestimated and therefore an interesting number of proposals for “repair” are brought out into the open now and often already have been carried out.

The leading idea is developing the dams and their surroundings from icons of safety to icons of durability.

Central themes are:

- Betterment of water quality is a dominant motive; enhancing the quality of sweet waters behind the dams is necessary in a number of places. We found out that therefore sweet and salt water are not absolute enemies;
- Where possible (partly) restoring a more fluent transition between salt and sweet waters by creating brackish water zones and fish passages. Making the dams more flexible and sometimes “permeable” (for fish). We are starting to rediscover that the Delta waters and the IJsselmeer are feeder lines for the North Sea and the inland rivers ecology.
- Experiments with durable (shell)fishing methods are under way but demand “negotiating” between the fisherman and ecological organizations.
- Restoring Delta nature, which has been badly damaged in the “dike building” era, is a “trending topic” these days! Deterioration is fought by realization of a great number of nature building projects to create a more robust delta ecosystem and finding a new balance between safety and the resilience of the natural system.
- Proposals and experiments for using the growing possibilities for tidal and blue energy are brought forward.
- Utilizing better the possibilities for tourism and (water) sports of the flourishing estuarine nature areas is often a regional spearhead.
- Intensive monitoring of birds and aquatic life has become regular. However still difficult for the aquatic flora and fauna.
- The whole process of thinking out innovations, assess them, finding support and money and carrying out the works take considerable time. Periods of 10 to 20 years are “normal”. During this time the process is vulnerable from change of views in the political world and lobby work from countervailing powers. Also the acceptance of the “new paradigm” by scientists, politicians and the public takes effort and time.

The above processes will be demonstrated with the innovations in thinking on the future of the Blue Heart (the IJsselmeer area) > the Afsluitdijk and the Markermeer< and with the major developments in the Zeeland Delta.

The IJsselmeer dam (Afsluitdijk) and the Markermeer.

- After more than 40 years of debate the Afsluitdijk was completed in 1932. Major achievement of the Dutch hydraulic engineering and major ecological disaster in one. The people around the inland lake IJsselmeer were safe for the first time in centuries,

but a large and fruitful intertidal area was cut off from the sea, with disastrous effects on fish (herring, ale, and anchovy) and fishery. Around 2000 discussion started about the possibilities of making the IJsselmeer a more lively part of the Dutch estuary landscape. In 2007 the government asked a number of organizations and companies to propose ideas for opening up new horizons for the Afsluitdijk >> enlarge safety in combination with creating a more gradual salt/sweet water transition and generous fish passages. But also possibilities for durable energy and tourism. A number of proposals were presented. Not all "ripe", but nevertheless it could have been the start of an interesting discussion of making this iconic dam, also an icon of durability. But the government got cold feet, paralyzed by the Euro crisis as it is and decided not to engage in an integral discussion on the future of the dike. It restricted the decision making to safety matters (a sustainable dam) and handed over the integral discussion to the provinces. Which are working on a plan now for "green" energy, sweet/salt water transitions, fish passages and tourism. This gives also room for initiatives of green organisations to make proposals. One of them is a plan for fish passages promoted by the Wadden society.

- In the southern part of the IJsselmeer area, the so called Markermeer, intensive studies are undertaken to better the water quality and to build large nature areas in the lake. Either by creating long stretches of moorish "land" adjacent to the dikes or as an ensemble of raised islands. Also the (inland) dikes itself and the surrounding areas will get a more "natural" appearance and more ecological value. This will be very specially favorable for the thousands of migrant birds that stay in the area in spring and autumn. One of the greater projects, The Marker Wadden, originates from and is promoted by our "National Trust" (Natuurmonumenten) and is sponsored by a great lottery company.

The Delta dams and the areas around The Haringvliet Complex

In 1971 an enormous array of 17 vertical sliding doors was built in the mouth of the Haringvliet. Where the waters of the Rhine and the Meuse meet the sea. After the construction the Haringvliet gradually became fresh and without tide. The effect on the intertidal shores was disastrous as was the effect on the possibilities for fish like salmon to swim up river in the mating season. After a long debate the government decided in 2011 to open the sluice complex a bit to introduce a salinity gradient thereby enabling migratory fish species to swim in and out. There was strong opposition from the sweet water users, farmers and drinking water companies. But there were also international duties obliging the Dutch to facilitate fish migration to Germany and France.

The prospect of renewed river (tidal) dynamics induced the Province of South Holland to undertake a very ambitious program called "Delta Nature". The program contains about 24 projects in a large area around the Haringvliet, with a total of 2400 hectares of new "wet nature". It brings the sweet water intertidal nature back into the Delta. Which is unique in Europe! In this, also European, project a BALANCE is sought between building new nature and finding recreation possibilities for the nearby citizens.

The program is carried out and supported by a broad coalition of the State, regional authorities and green NGO's. One of the top projects was the conversion of the agrarian island Tiengemetten, 10 km², into an organized wetland "wilderness", with touristic impact.

The Grevelingen

This sea arm was closed in 1972. Became tideless, but remained salt!

In the past the saltwater lake suffered from oxygen depletion in the deeper layers. The construction of an opening through the Brouwersdam > de dam closing off the original opening to the sea < has partially resolved this problem. Nevertheless the Grevelingen is still a fragile aquatic ecosystem in which the natural dynamics are insufficient to maintain a healthy balance. In 2002 a proposal for betterment was launched by a small "think tank" called Delta Synergy. Of which I was a member. Basis assumption was partly restoring tidal dynamics, by making a much greater opening in the dam. In the opening could be placed a tidal energy power plant. The idea got appraisal, but was not picked up easily. Around 2006 the regional authorities got

enthusiastic, raised funds and started extensive studies. Which recently resulted in an environmental assessment report (MIRT Grevelingen). Based on no less than 25 studies. The results are promising:

- A tidal stroke of 50 cm is enough to restore water quality, especially by bringing oxygen in the deeper layers. It is an optimum between existing nature values and development of new intertidal nature.
- With the (modest) reintroduced tidal stroke there is potency for the development of 650ha new tidal nature. Alas does this also mean that areas of very valuable "dry" nature get lost and that breeding grounds for coastal birds are in danger to and have to be protected.
- The possibilities of a tidal energy plant are extensively researched and have undergone a "market scan". The results are very positive, and got an interested, sometimes enthusiastic reception. The assumption is that tidal energy here can provide electricity for 30.000>50.000 households. (Almost) decided is now that that new techniques are going to be experimented. This pilot will take place in a "Grevelingen Tidal Test Centre", which is part of a European experimental project. In which several other tidal regions will participate. As it seems subsidies will be needed to get a competing energy price. But that is the same with wind energy, which up till now is heavily subsidized.
- The various interventions are calculated. And will be "embedded" in an integral development scheme for the region as such. With meaning for tourism, agriculture and land-water relations etc. >> "a salty bay of world class once more in balance" is here the leading motto.

The Oosterschelde

After a "furious" debate Dutch Government decided in 1976 to build an open barrier instead of a closed dam in the Oosterschelde. To preserve the unique salt water quality of the environment and the favorable (shell) fishery conditions. The open barrier contains a number of 65 vertical sliding doors that only close during heavy storms and high water levels. The storm surge barrier was completed in 1986. It has changed the dynamic equilibrium in the tidal basin leading to the threatening disappearance of the intertidal areas, as their sediments are redistributed to fill in the deeper channels. Not enough sediment is brought in to fill the "sand hunger" of the system. Finding a long term solution to this problem is the greatest challenge to preserve the ecological and economical values of the Ooster Schelde. In the coming time trials will be undertaken with sand suppletion on several banks.

Around the shores of the basin interesting projects have been undertaken or are under way to compensate the loss of nature (especially salt marshes) in the basin and enhance the ecological values of it. And making the island of Schouwen "Climate Proof". With the Plan Tureluur (project Redshank) a considerable inner-dike area in the south of Schouwen is given a brackish character of which many birds profite. The total project contains 44 spots where dunes are created and also sweet water and brackish moors

In that region there is also a proposal for an aquaculture project which is located inside the dike, but with a connection with the basin. Here also a lottery company is the financial facilitator.

All these projects are started from the philosophy of the so called Green Deal > a strategy of combining economic and ecological goals.

The Krammer-Volkerak and the Veerse Meer.

The Veerse Meer became a sweet water "sea-arm" closed off around 1960. It developed as a large scale recreational area, with harbors, camping's, summer houses etc. But the water quality declined during the years. Some years ago a small inlet was made to, during flood time, let salt water in from the Oosterschelde flow into the basin. This improved the water and ecological conditions considerably.

The Krammer Volkerak, in fact originally the most northerly brackish part of the Oosterschelde basin was cut off and made sweet around 1995. With the most "intelligent" lock, that can divide salt and sweet waters almost completely. This was mostly done to get sweet water for the farmers on the Brabant shores. But the

“generous” use of manure by these farmers polluted the waters in a way that in summer there mostly is a “green soup” instead of healthy waters. So now studies indicate is that it is best to make the Krammer salt/brackish again to restore the water quality.

Fish immigration through the Northern Dikes

For the Northern provinces exists a policy document called “Fish Immigration in the Northern Netherlands”. This vision is based on the betterment of possibilities for fish to migrate from coastal waters to the inland. Preferably in combination with the recovering of a salt/sweet gradient. Since 2006 the mapping of bottle necks for fish migration is obligatory for water boards. This policy results on this moment in a number of proposals for adding specific fish migration facilities to the “classical” pumping stations and for a specific fish migration friendly regime for the pumping activity itself. For instance the Waterboard Noordzijlvest, near Delfzijl recently presented its proposals.

The attitude of the (national) government and the role of private actors.

- We can speak from a “clash of civilizations” > from a society focused on safety and profit to a society based on principles of a durable civilization > the paradigm shift brings different actors, with different values and new roles for science and monitoring.
- The attitude of the national government is changing from key note player to linesman. Safety and water quality have become the “only” government tasks as it seems now. Integral responsibility is considered to be not any more a national task
- The regional government (the province) is taking the lead now. In the Delta the three provinces steer the process through the Delta Council and have in fact the lead now. In the IJsselmeer area the provinces are searching to fill in their new role.
- European subsidies helped in different cases and will be necessary in the future.
- Water boards which traditionally took great care on safety matters now combine this often with care for water quality and ecology.
- The power of “green” organizations in developing ideas and organizations grows fast. There is room for bottom up initiatives. These grass roots initiatives are greatly influencing the “agenda”, sometimes supported by great lotteries. A new planning/action model seems to be in the making!
- But with all this the question remains who takes care of the blue treasures in an urbanized society where other values are dominant? Countervailing powers are growing stronger: lack of inspiration, other interests prevail, lack of government, lack of money.