COPING WITH DISASTERS: FLOOD MANAGEMENT IN NETHERLANDS

Adaptation by society is most important in face of disasters. It is the interaction of emerging situation and the society that matters more rather than the impact of the disaster on the society. In this chapter we will see how society in Netherlands has risen as a united force to overcome perennial floods. There is an important lesson for all societies in this.

Geographic Peculiarity

Flood management has been an important issue for the Netherlands, as about two thirds of the country is vulnerable to flooding. Map of Netherlands (Fig 3.1) looks like a collage of swamps and dunes. Its coast is formed by a row of dunes and natural embankments. In several places the sea seems to have broken through the dunes and created extensive floodplains. For a long time there was a perennial threat of the coast being washed away by the sea. The flood threatened area of the Netherlands happens to be an alluvial plain, built up from sediment left by thousands of years of flooding by rivers and sea[24]. The first inhabitants of this area were

[24] H Gerristen, What happened in 1953, The big floods of Netherlands, Royal Publishing Scty, 2005.

1953 Floods: With dikes washing away Blue Areas became vulnerable to flooding

Fig 3.1 Netherlands Coastline

probably attracted by the clay soil which was much more fertile than the soil further inland. The only areas suitable for habitation then were the higher grounds in the east and south of the country including the dunes and natural embankments.

Historically, floods occurred very frequently and thousands of people died. There were several periods of habitation and abandonment of these areas as the sea level periodically rose and fell. To protect themselves from the sea, people built refuges called 'vlietbergen' or 'terpen' mounds. As the size of these mounds started to grow, small villages were built on top these hills. To connect the villages, people constructed small levees between them, through what polders arose and many wind driven mills kept the polders dry. **Thus Netherlands grew larger, piece by piece.**

<u>The North Sea flood of 1953</u>

Meteorological cause On the 30th of January 1953 in the South of Iceland, a storm field with a huge depression behind it arose. It came from the North-West in the direction of the Netherlands and dropped large amounts of water in the direction of the strait of Calais. This narrow passage served as a funnel, propelling the water more and more, while the water levels gradually rose. The situation worsened under the influence of a hurricane that formed on the edge of Scotland. In some places in the

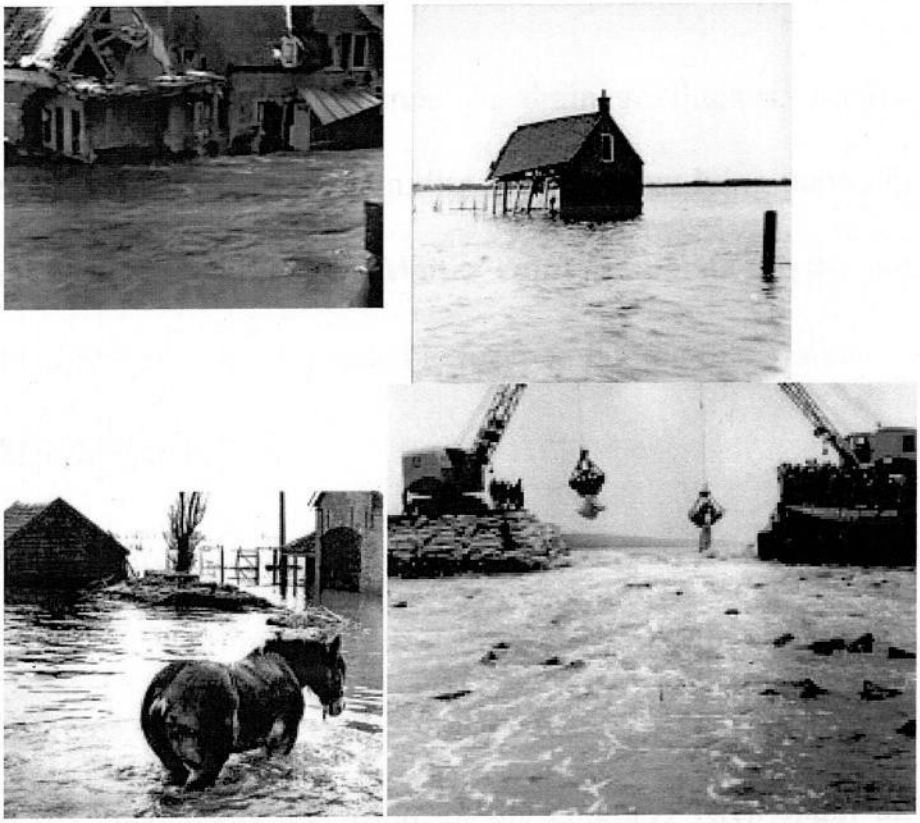
Netherlands the water already started to stream over the levees. On the night of the 31st of January the storm became stronger above the North Sea, with the spring tide. The levees were not designed to withstand these high levels and the first levees failed before the highest level was reached. In total 89 levees were destroyed. They were too long and were weakened by both a lack of maintenance and damage caused during the Second World War. The plan for structural improvement of the levees and the shortening of the coastline had progressed slowly.

Combination of a spring tide and storm in North Sea led to the floods affecting the United Kingdom, Belgium and the Netherlands. 2,167 people were killed, of which 1,835 were from the Netherlands. This disaster has had a large influence on the way the Netherlands protects itself against the sea, today, and in the future.

Devastating power of the sea. Many people woke up frightened by the water that night. Houses collapsed due to the power of the streaming water and the raging storm. (Fig 3.2)The situation worsened and many more people died with every high-tide as levees were already destroyed.

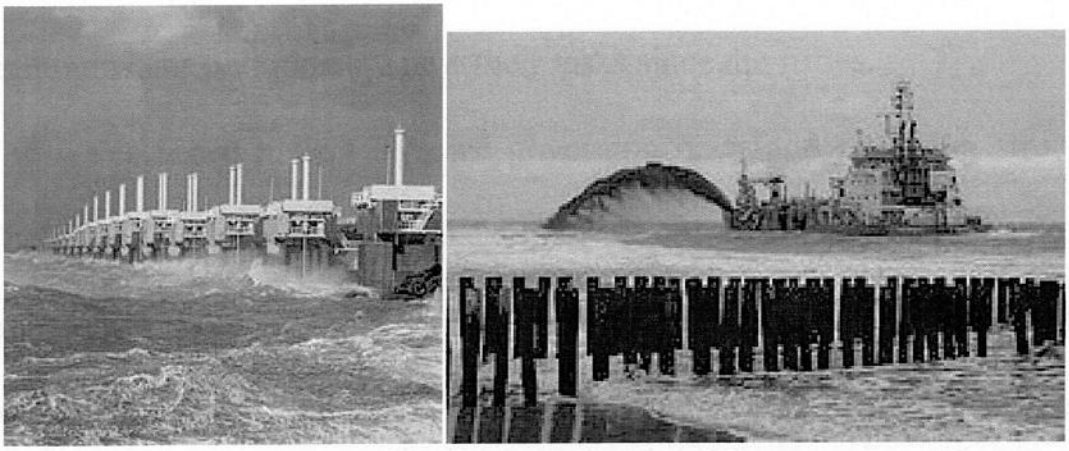
Aid Due to the flooded transport links, it took a long time before the rescue operations could begin. Inhabitants from the affected areas were evacuated and goods and sand bags were dropped via airplanes. A large aid

FIG 3.2 Devastation during Floods



Floods cause extensive devastation

Flood control



Oosterscheldekering at work *during a storm*and Sand replenishment in front of a Dutch beach .

200,000 cattle drowned. 140 km of levees were heavily damaged with holes of up to 3.5 km.

Today a complicated system of drainage ditches, canals and pumping stations (historically: windmills) keep the low lying parts dry for habitation and agriculture (Fig 3.2). **Water control boards** are the independent local government bodies responsible for maintaining this system.

Water Boards

Water boards are considered to be the oldest democratic institutions in the Netherlands. From the 13th century onwards they were established in the low-lying parts of the country. (Lazaroms, 2005)[25] Nowadays the water boards encompass the whole of the country. Their main task is providing protection against flooding from both the sea and rivers by means of dunes and dykes. They also ensure Surface water quantity management ensuring that it is kept at the right level for irrigation. Surface water quality and fighting water pollution are new their tasks since the fifties.

The water board have their own governing body and financing structure. There are five categories of stakeholders according to the Water Boards Act. All categories have a fixed number of seats in the assembly, which corresponds with the balance of interests (and tax payments) concerned in

[25] The Dutch Waterboards Model, Lazroms (2005)

the activities of the waterboard. The water board has an executive assembly (about 5 seats), which is elected from the general assembly (about 30 seats), and a chairman. The chairman is not elected, but appointed by the Crown.

The water board as a public institution is based on the Constitution and the Water Boards Act. It has legislative power in the formulations of by-laws and makes decisions with respect to budget, annual accounts, taxes, control, water level, licensing and water management plans. It also has the authority to employ executive coercion. The central government provides a national legal framework and a strategic policy. The provincial government supervises the water boards and is authorized to establish or dissolve them. The provincial government defines the boundaries of the water board (based on river water basins), the tasks of the water boards, the assignment of the water board and its assembly. The province can also approve or reject its decisions and thereby ensures the integration of the water boards in Dutch public administration at the regional level. Through the required approval of the province for the annual budget of the board, control on the rates of the water board taxes is assured. These taxes are essential for their financial independence.

Financial Independence. The self-financing system of regional taxes makes the water boards financially highly independent from national politics and periods of economic decline. The water board charges embody the philosophy that those who benefit from water board activities should also

contribute financially to the activities. The benefits are connected to the amount of use made of the existing physical infrastructure and the costs such use incurs. No link is made with harvest revenues or other kinds of agricultural production for this would make the water board taxes highly unreliable

Governance. Water boards play a key role in water governance, which is immune to political whims. They keep pace with developments in society. Their organizational / financial structures and the legislative framework are adjusted and updated continuously, but the basic elements and principles remain intact. The existence of a democratic structure allows for the input and involvement of stakeholders.

Linking payment to input makes it possible to balance money against means at the local level. Having such a local taxation area is also of great significance for obtaining long term loans for large investments. All areas in the world have their own particular circumstances. It is a good to make use of other nation's experiences on issues like these. The Dutch history and experience of water boards may contribute to this.

Summary and Lessons from the Netherlands model

The reality of floods and their imminent danger is well understood by the population in Netherlands. With years of effort they have put in place a system in which they contribute with funds in form of taxes and ideas

through their own elected representatives. This involvement has given them an un-beatable confidence in their disaster control model. The potential victim is confident that the water board will take remedial measures to review dykes and terpens and protect him from floods. This confidence allows him to peacefully continue his life in spite of being right there in a potential disaster zone. This model relationship between a regulator and citizens is worth aspiring for in every nation and every society,

The response by local administration for disaster event is not a knee jerk reaction but a continuous process optimising available resources and technology. The administration is responsible to citizens and has their confidence.[26] This confidence is renewed through meaningful elections to the water boards.

The problems of rescue agencies in Netherlands will be minimal as their efforts are proactive and people are fully involved. Of course this is with respect to only one disaster the floods.

India is a large country but we can benefit from the Netherlands experience. We must allow our local bodies to take inspiration from this model and create conditions for them to successfully create mechanisms at local level to tackle frequently occurring calamities of their region. For instance, in areas affected by flash floods or cyclones the local council could

[26] Brief on Water Boards, International Institute of Social Sciences , Netherlands, 2012.

be tasked specifically to improve systems in a time bound manner. Let this be an election issue for the council and make performance criteria for re-election. Along with an initial financial support by the government let there be taxes based on property in affected areas for potential beneficiaries. The body should take over all aspects of disaster preparedness, mitigation and response. This would improve accountability, involvement and response. The funds from development schemes could also be channelized where possible. With optimal technological support and planning, it can result in huge savings for the exchequer as the need to summon external forces and resources will be minimised over a period of time.
