

Workshop Summary: Finding solutions to groundwater flooding – Transnational exchange on governance challenges

Friday, 29th September 2017, 09.00 – 11.30, TOPSOIL Partner meeting, Brugge

This document provides a summary of the discussions during the meeting. A draft was sent to the participants for feedback; their comments are included.

Background & Objective: The workshop has been set up by the Transnational Governance Team in TOPSOIL to provide a platform for transnational learning and exchange on governance issues linked to excess water and flooding. Starting point of the workshop was a case study presented by Herning Municipality, Denmark. Based on this responders from all partner countries were asked: What are the experiences in your country in dealing with a situation like in the Danish case? Responders received the case in advance in order to prepare their presentation. Next step in the workshop was a plenum discussion on presented challenges and solutions. The discussion aimed for knowledge exchange as well as an early contribution to roadmaps. Finally we evaluated this 'circulating case study approach' in order to prepare for a new round.

Due to different national settings, issues were raised which may not always be considered relevant or applicable to the case study owner. From a TGT point of view exchange and inspiration in between all partner countries is valuable, thus the summary tries to cover all issues central to more than one partner country.

Agenda, presentations and also this summary can be found at TOPSOIL midtrum/WP6/ SundsCaseWorkshop.

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Danish Case: Managing Excess Groundwater as a result of both climate change and improved infrastructure (Søren Brandt, Herning Municipality)

The municipality of Herning is legally required to and limited to manage sewage water, not the groundwater table. Due to sealing of the sewage pipes, groundwater is not drained any more from the area. That fact on top of the general rise in groundwater level leads to flooding of private cellars. The situation is expected to worsen with continuing climate change.

- Neither municipality nor the water company have any obligations towards handling excess water on private property, e.g. by establishing a third string solution. In fact the current legislation prevent them to take action.
- At the moment landowners keep their cellar dry by connecting the drainage system to the sewage system without paying. Moreover the general bad condition of the sewage pipes leads to a lowering of the groundwater table.
- The result is that large amounts of drainage water (approx. 1.000.000 m³/year) are needlessly treated as waste water.

Part of the case study description included specific questions posed to the responders. In the following, first a summary of each response will be provided before a table tries to summarize the direct answers.

German Response: Summary of Situation compared to Danish case (Björn Panteleit, Geologischer Dienst für Bremen)

Although there is in general no similar situation in the Northern part of Germany, in the area of the fair and conference center in Bremen, the groundwater table is too high for infiltration of rainwater. The surface runoff due to precipitation is discharged to the sewer system. As a result, the nearby harbour lacks the surface runoff, and instead has to deal 1-2 times per year with an overflow of the sewerage, both impacting the water quality in the harbour. This has been solved by decoupling the runoff from the parking area, leading it through a soil based filter system and into a pond, from which it is led to the harbour. In a different case, the Apeler See (a lake) is kept by pumping the excess water to the Northern Sea on a stable level in order to manage the groundwater level in the surrounding area (Marsh land). Large amounts of groundwater are not stored in Germany. Dike association are in charge in managing the groundwater level.

Belgium Response - Summary of Situation compared to Danish case: Dieter Vandevelde, Vlaamse Milieumaatschappij

In Belgium, a polder area with too high groundwater level would be managed by adapting the drainage system, flooding of meadows and regulating surface water levels. In urban areas, mapping would take place to identify in detail where problem areas are situated. For this, the VLAGG database (modelled floodings) could be consulted, combined with a check by local authorities in situ: Did we miss a flooding? Is it a problem or is flooding acceptable? Are problems time related? Knowing in detail the hydro(geo)logical setting (building up of groundwater levels above local impermeable layers) together with stakeholder a search for solutions would be started, taking into



consideration the following question: What is the water demand of the area? Can someone use the excess of water?

Resulting mitigation option would include:

- Vertical and horizontal drainage or extraction of groundwater
- Groundwater barriers
- Perforation of impermeable layers
- Giving space to water (open canals, ponds, ...)
- Impermeable cellars

The choice of options would depend on the effectiveness of mitigation, costs, if they are technical feasible and who will do the follow up. Most like case study for the mitigation options on a small scale will be tested and implemented first.

United Kingdom Response - Summary of Situation compared to Danish case: Max Tant, Kent County Council

The situation in Kent is very different, with highly fluctuating groundwater levels and only intermittent flooding problems which affect only a few properties at once and for a relatively short period of time (6 months in 5-10 years). Low levels of groundwater are considered a bigger problem generally. In the case of connections to the foul sewer, the Sewerage Undertaker is private and as in this case they are not required to take water like this away. However it would be costly for them to identify all of these illegal connections and connections like this to a sewer are common, though on this scale there would be a noticeable effect on the sewer performance. Property owners are temporarily permitted to discharge pumps on to the highway and Kent County council manage the impact of this. We also have to deal with flooding at the same time though and the area is generally quite wet.

A schedule of emergency measures has been developed based on last years' response, detailing pump and sandbag locations. There is a corresponding schedule to detail the number of sandbags, pump size etc. The multi-agency flood plan is being updated with this information

The Netherlands: Response - Summary of Situation compared to Danish case Anne Helbig, City of Groningen

In The Netherlands, water levels are managed by level control in the ditches (see 2nd slide in presentation). The Dutch approach to the Danish situation would be:

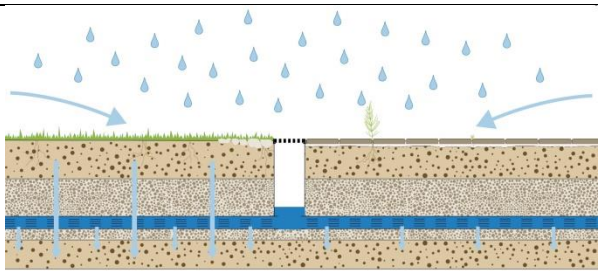
- Monitoring
- Analyse the situation
- Who is the problem owner?
- Discuss this with the stakeholders
- Think about possible solutions
- Implement the solution
- Monitoring

Strong emphasis was put on establishing multi-functional infrastructure or solutions, and on involving all stakeholders actively for sharing the responsibility and improving the implementation of potential solutions. Since 2008 the responsibility on this topic has been described by law. There was a common interest at the workshop on this law, and Anne Helbig talked about looking into the possibility of translation.



Overview on responses to questions by Danish Case

The Danish case study providers asked the responders specific questions. The answers summarized in the table below have been copied directly from the slides.

Country	Who is responsible for the groundwater table in your region?	How is the groundwater table regulated?	Are there any innovative solutions to utilise huge amount of excess water?	Where do you store excess groundwater?	Which service level are we committed to manage the water?	Is it possible to operate with one water operator that handles the comprehensive water planning and water circuit based on legislative requirements?
D	Water authority / dike association	Drainage ditches in the marsh areas	Not to my knowledge	We don't do it.	-	-
BE	Water managers (polder board, ...) Groundwater permits: local government (municipality, province) VMM: groundwater management / provide advise	Mainly by drainage systems	<ul style="list-style-type: none"> - Using for industrial purposes - Using for drinking water supply - Using for freshening the watercourses influenced by salinization 	There is mainly a shortage of water, especially in summer months		Yes (Environmental Impact Assessment can be needed)
UK	No one. The County Council or Unitary Authority has powers to manage groundwater flooding but these are permissive and do not extend to managing the water table. Generally if cellars are being affected by groundwater it is regarded as the homeowners responsibility in the same way as damp or subsidence. Groundwater as a resource is monitored and regulated by the Environment Agency, but this does not include excess levels, they mainly focus on low levels and water quality.	It isn't regulated from a flooding perspective. Groundwater in areas susceptible to groundwater flooding is almost always also a source of water (Kent gets 75% of its drinking water from groundwater) and feeds a number of important waterbodies, so it is regulated as a resource to ensure there is enough available for drinking and to maintain sustainable flows in watercourses, but not to prevent flooding.	Not that we are aware of. Extra abstraction for drinking water is unlikely to remove sufficient water to prevent flooding and given the infrequent nature of it there is unlikely to be a cost effect way for providing the infrastructure to do this, though we are trying to explore the possibility of extra abstractions. We would be interested in any ideas.	It generally flows down small streams and roads and causes flooding. Into which service level are we committed to manage the water? From a flooding perspective, any improvement is welcome. From the impact on the sewer there are targets, but the long term nature of the groundwater impacts makes it difficult to measure against the targets.		We don't in the UK!
NL	The private owner is responsible for his/her own property, for example problems can be caused by the construction of a building. The municipality is responsible for receiving the private drain water and for regulating the ground water table in public space. Since 2008 there's legislation on this topic.	Often the groundwater table is regulated by sewer systems which also function as drainage By level controlled drainage The management of the surface water is partly of influence on the groundwater level in urban areas		Ditches, (see examples in presentation)	Spreading the responsibility is effective.	All groundwater questions can be addressed to the municipality Depending on the type of question the answer is given by one of the water authorities



Discussion Issues

Placement of responsibility

The Danish municipality is not allowed to act beyond their responsibility. Moreover draining water is legally different from rainwater. A change here would require a change in the National Water Law.

In Dutch context, climate change adaptation crosses sectoral competences and sometimes widens responsibilities and opens new possibilities. This way other responsible organisation and also new funds become available. In The Netherlands, a multi-purpose solution would be looked for, e.g. combining nature protection, storm water management, drainage water management and recreation.

In UK and Germany house owners are responsible for solving their wet cellar problems. Still, the authorities would probably be allowed to find support for them, if the extend of the problem may be of importance for a larger area or due to their own changes in managing the groundwater table.

In NL, since 2008 house owner are responsible for excess water on their own ground. The municipality has to manage it in public space. The municipality is also responsible for analyzing the problem, and setting up monitoring.

In Belgium, groundwater and drainage water is legally not distinguished. In Belgium a special grant was set up in a similar case which house owners could apply for to get their cellars restored /sealed.

Monitoring / Development of Knowledge Base

While the potential damage is local with the individual house owners only, the area where groundwater table raising occurs seems to be larger. An assessment of the precise extent e.g. by establishing a monitoring system could be one approach.

In Belgium they would combine this with a model approach to get a better understanding on the risk. A good monitoring network would be set up for building a sound knowledge assessing the extent and the severeness of the problem.

Monitoring is often in the hands of the national level. Still, monitoring was considered as central for better adapting solutions to the problem. In Denmark, built on the results of monitoring legislation is developed. So good monitoring leads to good legislation in Denmark. In the Netherlands, you would need good legislation for good monitoring.

In NL, a dense monitoring network in the area of Groningen (with more than 150 monitoring points and also targeted to specific projects (e.g. new ring road) was set up and paid by municipality (about 100.000 Euro/year). Other monitoring activities are in the hand of the national level in NL.

Stakeholder Involvement

Stakeholder involvement in such a situation would be crucial in Belgium, NL and UK. From the discussion, broadening the number of responsible persons / organisations and involving stakeholders were considered very important: the extent and the development of the situation are uncertain.

In The Netherlands, there have been good experiences with spreading the responsibility. This means that not only the municipality is in charge and responsible for identification and managing solutions. In addition, other central stakeholders (regional government, water associations, house owners, industry, NGOs...) are involved to identify good



solutions, and maybe also find a good combination of solutions. The stakeholders may be not only involved during the identification process but partly also for funding them.

In UK, a “Problem Steering Group” could be set up, involving national and local level as well as all relevant departments.

(Technical and financial) Solutions

Solutions can be large scale solutions (e.g. third pipe solution or establishing a large water user) or “decentralized” and directly implement by each house owner.

There might be a window of opportunity for a (not yet approved) third string solution due to on going sewerage restoring works in the street.

In the German example, a large storage was implemented, including a filter system for cleaning water.

In Belgium, the approach would be more house owner oriented, offering groundwater barriers such as impermeable cellars to house owners. They would be supported by “renovation grants” to the house owners and accompanied by monitoring the development of the situation. Belgium has also developed a blue spot map with the option of adding remarks from reality.

A Dutch solution would try to apply a multi-use solution, creating ponds or infiltration areas for both storage and recreation. Sometimes roads are turned into storage ditches. Also good experiences with combined pipes for storm water and drain water was mentioned.

The UK example showed that they pumped the excess water to a controlled flooded highway.

New house builders in NL and UK are also obliged in some areas to get advice on the groundwater situation.

Feedback on Case Study Approach

How useful do the case study owner and the responders find the approach for discussing governance issues? The following comments were collected:

It was interesting to see that different paths can lead to the same problem and interesting to see the different countries’ approach to find different solutions.

The template was considered useful also for future case studies, as some questions need to provide a red thread and a link to governance issues. This helps to focus.

Further the importance of finding the right responders (even if they are outside topsoil) was emphasized. For example, responders who are directly linked to the decision making process in groundwater management can provide a practical perspectives on how governance structures are implemented.

There was an atmosphere of a strong commitment at the workshop and a high level of activity between the participants. Also new topics for next case study were already mentioned.

