Polderen tussen Regie en Loslaten;
De afstemming tussen bodembeheer en ruimtelijke planning als voorbeeld

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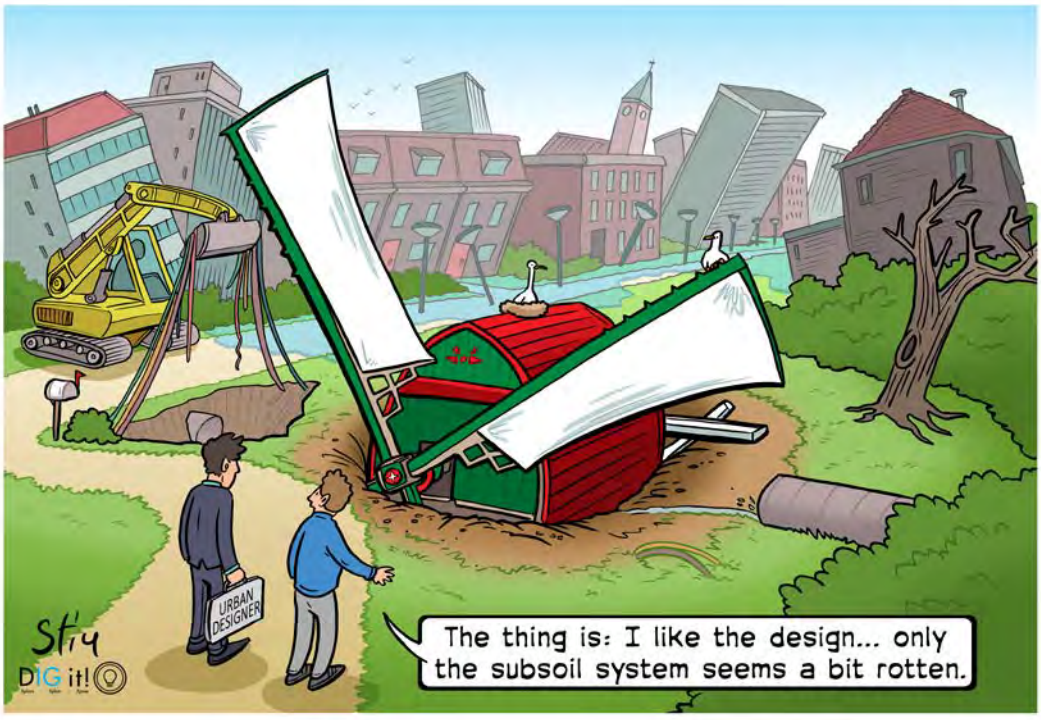
Terwijl de regie op de ruimtelijke ordening in Nederland wordt losgelaten is er vanuit klimaat- en energieopgaven, en ook vanwege de financiële crisis, juist behoefte om de regie ten aanzien van de bodem aan te trekken. Het is een spannend speelveld dat in het onderzoeksproject *Balance4P, Balancing decisions for urban brownfield regeneration – people, planet, profit and processes* wordt onderzocht. Het afwegingsproces van de ruimtelijke ordening heeft domeinen die technisch geregeld kunnen worden, zoals water, energie en bodem, decennialang nauwelijks meegenomen. Nu aan de oneindige mogelijkheden een einde is gekomen is water intussen weer integraal deel van de afweging en zijn energie en bodem al aardig op weg. Het probleem in de herontwikkeling van de bestaande stad is dat er voor de afweging samengewerkt moet worden en het verschil in taal, concepten en omgang met onzekerheid nog een zekere scheiding aanbrengt tussen de ruimtelijke en de technische disciplines. Balance4P heeft als doelstelling hierin verandering te brengen en een bijdrage te leveren aan een betere afstemming tussen bodembeheer en ruimtelijke planning. Een belangrijk onderdeel van het project is het bekijken van de planningsystemen van de drie betrokken landen: Nederland, België en Zweden. Dit artikel verhaalt de onderzoeksresultaten van de analyse van de Nederlandse en Belgische planningsystemen en hun relatie met sturing op ondergrondse categorieën water, energie, civiele constructies en bodem. De vergelijking wordt gedaan op basis van een typering van de verschillende beleidsschalen, de belangrijkste wetten, regels, instituties en beleidsdocumenten. Uiteindelijk leidt dit overzicht en de analyse tot conclusies die iets zeggen over mogelijke relaties tussen bodembeheer en ruimtelijke planning en tussen regie en loslaten.



Polderen tussen Regie en Loslaten;

De afstemming tussen bodembeheer en ruimtelijke planning als voorbeeld

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Stellingen
1- Bovengronds plannen zonder kennis van de ondergrond is als een taart versieren zonder de basis te bakken, het vereist regie!
2-De ondergrond doet meer met de planeconomie/grondexploitatie dan je denkt
3-Ruimtelijke ontwikkeling onder energie-transitie kan niet zonderregie op integratie van de ondergrond
4-Het veranderen van beleid is veel makkelijker dan het veranderen van de praktijk: is beleid de reflectie van de wensen in de praktijk? Wat voor regie wil de praktijk eigenlijk van beleid?
5-Loslaten binnen regie!

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Poldering between control and laissez faire:

The example of harmonizing subsoil management and spatial planning.

Introduction

The purpose of this contribution is to look at different planning contexts into which decisions about subsoil engineering presently need to be integrated. There are many ways of doing as well as theorizing spatial planning; and planning practice is constantly changing. Next to that, soil legislation and management has become more important to adapt to climate change, the energy transition and foremost to (re-)develop cities with lower costs. In this contribution we try to provide descriptions of a status quo (2014) that identify key moments where in could be useful to integrate subsoil knowledge, technology and procedures in planning. In the first section, we define the field and identify the sources that provide the framework for the description of spatial planning in the Netherlands and Belgium. In the following sections we describe the main features for each country concerning guiding principles; main institutions; legal framework and planning documents. For every feature we make the connection to the subsoil management aspects. The final section provides an overview of the main differences and overlaps. This forms the basis for the conclusions on potential strategies for integrating subsoil decision-making with spatial planning.

1. Planning system, planning practice, planning culture

1.1 Definitions of planning

There are numerous definitions of spatial planning. One of the earliest definitions is as follows:

> *"Regional/spatial planning gives geographical expression to the economic, social, cultural and ecological policies of society. It is at the same time a scientific discipline, an administrative technique and a policy developed as an interdisciplinary and comprehensive approach directed towards a balanced regional development and the physical organisation of space according to an overall strategy."* [1]

This comprehensive definition from the European Regional/Spatial Planning Charter, adopted in 1983 by the European Conference of Ministers responsible for Regional Planning (CEMAT), is not workable, but it illustrates the complexity of the discipline. Planning is at the same time policy and practice; and it needs to be concerned with all aspects of social, environmental and economic development in a coherent way. Moreover, the different developments each have their own rhythm; for example financial conditions change much faster than demographic profiles or eco-systems and planning decisions that involve large investments or infrastructure take a long time to realize while the needs of society change rapidly. To plan 'according to an overall strategy' at all scale levels is therefore an illusion. Nevertheless, policy-makers articulate priorities that steer planning decisions and need to be implemented. The term 'spatial planning' is often used at the same time for both these decisions (the substance of planning) and the governance system (the process of planning). For example the European project for planning and climate change adaptation ESPACE states:

> *"Spatial planning is a process that assimilates and interprets evidence-based knowledge to inform those activities that aim to ensure spatial development takes place in an appropriate, sustainable way, from a functional, social, economic and environmental point of view."*[2]

For Balance4P (see textbox 1)[3] the main interest lies in the processes of planning, and this is what we refer to when discussing 'planning systems' [Nadin & Stead, 2003]. Moreover, the professional structure of planning does not only consist of formal, written procedures and regulations. The unwritten assumptions and concepts, for example about the role of inhabitants, the reliability of government or the importance of nature, form planning culture. These influences, as far as they are important for subsoil engineering, are investigated in the project Balance4P.

Textbox 1:Balance4P
BALANCE 4P is a project with a consortium from the Netherlands, Belgium and Sweden about developing holistic approach that supports sustainable urban renewal through the redevelopment of contaminated land and underused sites (brownfields).

Several organizations have made compendia of spatial planning systems in Europe. We make use here of the Isocarp International Manual which features all partner countries of Balance4P [Ryser & Franchini 2008]. A comparative table created by the COMMIN Interreg IIIB project provides a useful framework to structure the comparison.[4] To describe planning systems, COMMIN uses 5 categories:

1. Constitutional
2. National scale
3. Regional scale
4. Local scale
5. Participation

For understanding the planning context, in the following sections we describe its main features in the respective countries. First we look at the guiding principles, the objectives defined for planning. Second, the principal planning institutions are identified. Then we look at Planning Acts and other legally binding context. Finally we provide a summary of types of planning documents that are commonly used and generally recognised.

1.2 Definition of subsoil

In the Balance4P project the subsoil is considered everything below surface. The System Exploration Environment and Subsoil [Hooimeijer and Maring 2013] that is used to connect the surface with the subsurface use the subsoil qualities as they are defined in www.ruimtexmileu.nl. Here the subsoil qualities are organised in the categories producing, regulating, carrying and informative qualities. The ecosystem related view does not connect very well with the spatial planning perspective on space, thus another categorization is made: civil constructions (archaeology, explosives, underground building, cables and pipes), water, energy and soil itself. These categories are used per planning aspect to compare the two countries on a more general level, the website gives elaborated information on subsurface qualities, the instruments, regulation and policy.

2. What are the guiding principles?

2.1 EU policies and regulations

The EU has no formal authority for spatial planning however it has influence in member states like the Netherlands and Belgium as a result of other sectorial policies and trans-border collaboration projects [Dühr et al 2010]. The 1999 (updated 2003) European Spatial Development Perspective (ESDP) is not binding but gives directions to achieve more territorial cohesion in Europe [Faludi 2006].

For subsoil management in the categories civil construction, water, energy and soil for each there are international agreements. Archaeology a feature of civil construction, gained one of the first specific subsoil related policy: the Malta Convention, signed in 1992 by 47 European countries in order to protect archaeological sites buried in the soil or seabed. The Malta convention also provides for the incorporation of archaeological heritage into spatial planning and the funding of archaeological research (the developer pays). In the Netherlands, the

convention is incorporated into the Monuments and Historic Buildings Act and the Archaeological Heritage Management Act.[5] For the category water the Water Framework Directive has quite a strong impact on the management of the river water system and also for groundwater there is an agreement on European level. For Energy the exact European conditions are still under investigation in the Balance4P project. For the subsoil qualities in the soil category there are directives such as NATURA 2000, directives considering waste, soil sealing and contamination, habitat, and birds that have legal status and thus need to be taken into account by spatial plans in order to be approved.

2.2 Constitution

Because of its wet and soft territory The Netherlands has a strong tradition in governance from an early age [Hooimeijer 2011]. Especially flood management, a main condition for spatial development, has been institutionalized and considered of national concern since the start of the Monarchy in 1814 [Van der Woud 1987]. Since the post-1945 reconstruction period, spatial planning in the Netherlands is seen as a public task. Traditionally, next to flood prevention a major issue concerns balanced territorial development, especially between the densely populated *Randstad* and the more rural eastern and northern provinces. In the 1980s planning had to respond to the new environmental policies with amongst other things the compact cities concept. In the neo-liberal era, Parliament is also concerned with the international competitiveness of the Netherlands. Regarding the deep subsoil, the Dutch Mines Act was established already in 1810 and replaced in 2002.

Until the 1970s spatial planning in Belgium was a national issue. Guiding principle from that time was the functionalist approach of separating industrial, residential and leisure areas. Currently, Regional authorities of Flanders, Brussels and Walloon are responsible for territorial development. In the Balance4P project the comparison and cooperation is done within the Flanders context thus here the focus lies on the spatial planning and soil management of only that region. The basic principles for Flanders Spatial Policies Plan (2012) are: the ‘Productive Landscape’, ‘The Long Term, Uncertainty and Governance’ and ‘Welfare and Well-being’.[6]

2.3 Historical and cultural aspects

It is said that the creation of Polders brought with it the necessity for collaboration and the resulting ‘*Poldermodel*’ characterises the negotiation process of spatial planning in the Netherlands: the negotiation process over land-use claims is called ‘poldering’[Lendering 2005]. In the 21st century, terminology such as integrative planning (*Gebiedsontwikkeling*) has become more widespread.

The planning system in Belgium today is very complex, due to its division into three regions: Flanders, Brussels and Walloon. The Federation has no constitutional powers regarding spatial planning and de facto there exist nowadays three planning systems based upon regional autonomy. At the background of all three lies the (then national) Planning Act of 1962, which inheritance is still present in legislation and district plans [IMPP 2008]. In practice the Flanders, Brussels, and Walloon context are considered national level.

3. What are the main institutions?

3.1 National

In the Netherlands, legislation is made by central government. Until 2010 there existed a Ministry of Planning that issued National Spatial Strategies followed by so-called key-decisions with legal binding elements. Spatial planning then became the responsibility of the Ministry of Infrastructure and the Environment (MinIE) while housing was assigned to

Internal Affairs. In 2012 it issued the *Structuurvisie Infrastructuur en Ruimte* (Vision Infrastructure & Space; SVIR) to set priorities for the development of the territory until 2040. Next to the ministry there are several research/planning offices such as The Netherlands Institute for Social Research SCP (*Social Cultureel Planbureau)* and Netherlands Environmental Assessment Agency PBL *(Planbureau voor de leefomgeving)*, Environmental Impact Assessment Commission (*Milieu Effect Rapportage Commissie)* and *Staatsbosbeheer* (Forestry) for the stewardship and management of forests.

The category of civil constructions in the subsoil is represented in a variety of institutions. Archaeology is under supervision of Cultural Heritage Agency of the Netherlands (*Rijksdienst voor het Cultureel Erfgoed)* part of the Ministry of Education, Culture and Science. In the Municipal Platform of Cables and Pipes[7] the development of policy and technology considering cables and pipes is supported, the same type of institutional support is carried out by the Centre of Underground Building.

The national care for water has been institutionalized for centuries in the ministry of traffic and water. However since the former government is has been combined with the Ministry of Spatial Planning into MinIE. The operational department of *Rijkswaterstaat* (Infrastructure) is still responsible for the development and management of infrastructure and water on the larger scale and setting the boundary conditions for urban development. An important institution that supports policy making and research considering water is Deltares.

On the national scale the categories energy and soil are covered in the national vision on spatial planning of the subsurface (STRONG), in preparation under the auspices of the MinIE and the Ministry of Economic Affairs. STRONG covers both deep and shallower subsurface[8] and is instigated by the fact that in the Netherlands the subsurface is being used more and more for different functions and the aspect of spatial relevance related to the subsurface is becoming of importance.
The MinIE is also responsible for soil protection. The National Environmental Policy Plan of 1997 stated that all sites with soil pollution should be known before 2005 and that all sites with serious risks shall be controlled prior to 2030. The MinIE is responsible for the organization of the soil remediation operation. In the fourth National Environmental Policy Plan, published in 2001, the Dutch government reconfirmed its intention to end the transfer of environmental costs to future generations. In 2003, the scope of soil regulation was also widened from quality to soil management with the "soil policy letter" (*beleidsbrief bodem*).[9] At 10 July 2009, the "*convenant bodem ontwikkelings-beleid en aanpak spoedlocaties*" [soil convent] was signed by central and regional authorities. The convent involves wrapping up of the soil remediation operation, as well as the decentralizing of the soil regulation to regional and local authorities.
Fossil energy (oil, gas and minerals) as well as geothermal energy are both under the Mines Act. The Ministry of Economic Affairs is the legal entity to address. Shale gas is a "new" form of subsurface energy-source and presently a shale gas vision (*structuurvisie schaliegas*) is being prepared.

In Belgium the federal government has some policies regarding environmental issues, however it has no planning competences. The Flanders region of Belgium, operates on a system of three planning levels: the region, provinces and municipalities that work together on principles of subsidiarity and framework control. How competences and issues for decision-making are divided is indicated in the 1996 Spatial Planning Decree and the Flanders spatial structure plan [IMPP:19]. Spatial structure plans provide guidelines and are aimed to (planning) authorities. The decreeing power lies in spatial implementation plans: all types of permits (building, parcelling, etc.) are checked against these implementation plans. Implementation plans are approved by the next supra local level; thus municipal levels will be assessed at provincial level, while the provincial plan will be assessed at regional level. Like in the Netherlands, spatial plans are subject to EIA procedures.

On the national level the Ministry of Economic affairs and the Belgium Geological department are the highest level concerning soil management. The Flanders Department for the Environment, Nature and Energy (*Departement Leefomgeving Natuur & Energie*) is responsible within Flanders and issued a decree in 2006 concerning soil protection and remediation, which became operational in 2008. It is especially directed at brownfield development (Brownfield decree), and for this purpose Flanders also has a Subsoil information system. Other measures concern prevention of pollution by emission directives.[9] Responsible for operationalization is OVAM (*Openbare Vlaamse Afvalstoffenmaatschappij*) is responsible for soil contamination and LNE-ALBON is responsible for the deeper subsurface.[10] Another important institution is the *Vlaamse Milieumaatschappij* (VMM, Flanders Environment Agency)[11] that hosts most environmental tasks like the EIA and issues of water and health. For archaeology there is the *Vlaams Instituut voor het Onroerend Erfgoed*.

3.2 Regional

The role of the twelve Dutch provinces is strong in spatial management but mainly advisory in development planning. Dynamic regions form special planning agencies to create inter-municipal Structure Plans in a cooperative body of stakeholders. Initially this was often imposed out of national interest, for example 'Rijnmond Main Port' counterbalanced by bottom up initiatives such as '*Zuidvleugel'*. More and more municipalities join forces to gain position, such as '*Stedendriehoek'* or '*Achterhoek'*. The mandates these Regional Agencies are given depends on the participating municipalities and is not regulated by law. Most regional agencies strive to involve the private sector and to present transparency in their goals and budgeting.[12]
Structure Plans are not legally binding but will usually be incorporated in *Streekplannen* (regional plans). Provinces are obliged to have regional plans and zoning plans, urban development plans and building applications are checked to fit the intentions of the Streekplan. The Structure Plans need to go through the Environmental Impact Assessment (EIA) procedure. The main purpose of the EIA is to ensure that decision makers have all necessary information. If a plan has negative effects on the environment, it may still be build, provided it has a sound argumentation.[13]

For the subsoil, the provinces together with the some larger municipalities are competent authority for soil remediation in the soil protection act. Water protection areas are taken up in the provincial spatial plans, environmental and/or water regulation plans. Another important governmental institution at the provincial level are the Water Boards (24). The oldest Dutch form of government is responsible for the larger water system, dikes, and the groundwater that is controlled by pumps.
The provinces also grant permits for some activities in the subsurface, such as water extraction or Aquifer Thermal Energy Storage (ATES). ATES systems need some spatial planning because of possible interference between systems. Application of ATES is regulated in the soil energy systems decree.[14] All provinces have soil regulation. After broadening the scope from soil protection to soil management (soil policy letter of 2003), the provinces prepared "soil visions" that outline their soil management policy.[15] In many occasions (Drenthe, Groningen, Utrecht, Overijssel, Brabant and Zuid-Holland), the provinces also prepared a structure vision for the subsurface that is only binding for the province itself. Most provinces facilitate the local authorities with soil information or guidelines for soil management.[16] In Utrecht the Framework subsurface was just adopted in April 2014 to have more control over the intensive use of the subsurface and organise better the new forms for energy, drinking water and remediation and mining activities in deeper layers (geothermal and shale gas).[17]

Flanders consists out of five provinces and 22 arrondissements that as described in the former paragraph play a role in the three step system of structure plans. In this approach the relation between national, provincial and municipal level is ensured; the provincial institute POM (provincial development agency) makes the provincial *Ruimtelijke uitvoeringsplannen* (RUP, spatial plans) and assesses the municipal RUP's.

For subsoil management the provinces have departments considering water, energy and soil.[18] There are no specific departments known about civil constructions. Next to the Provinces, like in the Netherlands, the Flanders territory is divided in larger water bodies (around rivers) and governed by Water Boards (52), however these also still have the smaller scale organization in polders (called a *watering*). The exact role and function considering integrated subsoil management is still under investigation in the project Balance4p.

3.3 Local

There are at present 403 municipalities in the Netherlands,[19] whose City Councils approve major planning decisions such as zoning plans and urban (re-) development. Decisions are prepared in planning departments, for smaller municipalities with support from the provincial planning department. Consent for the modification of land-use or building permits are issued at municipal level. Also these plans need to be assessed with the Environmental Impact Assessment procedure. Even though the advice of this national advisory institute is not binding, a negative advice is usually a strong base for preventing these plans through a court order.

For the subsoil, several larger municipalities are competent authority for soil remediation in the soil protection act (for small municipalities, this is the province or the newly established regional environmental services). The use of the shallow subsurface is very much related to the land use plans (*bestemmingsplannen*) for spatial planning. The municipalities or regional environmental services grant permits for some activities in the subsurface with the before mentioned land-use or building permits.

In Flanders the 308 municipalities are obliged to have a spatial structure plan, called RUP, however these are also drawn up at provincial level because a number of spatial issues are of a supra-local nature (but not necessarily of a Flemish/regional nature). Local councils approve municipal spatial implementation plans as elaboration of the municipal spatial structure plan. Implementation plans can define building areas, parks and leisure, densities typologies and management rules, and may provide layout for certain zones. Like in the Netherlands, plans need to go through EIA procedures. Unlike the Netherlands, a *Watertoets* (Water Impact Assessment) is needed not only for governmental pre-plans but also for private developments that apply for building permission [ESPACE project; Dreyfus 2012].

Considering subsoil management the situation is probably comparable to the Netherlands, but also a question of the Balance4P project to find out.

4. Which legal framework needs to be taken into account?

4.1 National / overall

The first *Wet Ruimtelijke Ordening* (WRO, Spatial Planning Act) of the Netherlands dates from 1965 and its current version from 2008. Public authorities at all scale levels are obliged to publish new plans online, the digital version even prevails if there is a discrepancy with the paper edition.[20]

A number of sectorial laws also influence planning as they have a spatial component, for example *Wet Geluidshinder* (noise) that defines norms especially for residential areas, or *Transport Gevaarlijke Stoffen* (dangerous goods transport) that is related to road profiles.

The main legislation concerning the subsurface that need to be taken into account by spatial planning are the Monuments and Historic Buildings Act and the Archaeological Heritage Management Act, the Water Act, Environmental Protection Act, the Mines Act, Soil Protection Act and Nature Protection Act. The main water governance structure is described above, for water filtering and water storage there is no specific regulation but should comply with regulation as stated in the Water Act. Extraction of water (for drinking water or (on smaller scale) process water has been regulated in the Water Act. Spatial protection zones for drinking water are designated: water winning areas and groundwater protection areas, the latter is taken up in the Environmental Protection Act. The latter act also obliges municipalities for taking care of their sewer system.
The Mines Act was established already in 1810 and replaced in 2002. The Ministry of Economic Affairs is responsible for the mining activities. The Soil Protection Act was established in 1987. The immediate cause was the discovery of some seriously contaminated sites such as *Volgermeerpolder* and the residential area *Lekkerkerk*. In those early years, remediation consisted of excavation of the whole area. A very expensive exercise. In the following years, the regulation contaminated sites developed to the current practice, a more cost-effective risk-based approach. Subsurface storage (>100m) is subject of the mines law and moving contaminated soil is regulated by the soil quality decree.[21]

Presently a process of integrating sectorial domains is taking place in the Netherland. This is done in organizations by for example merging the ministries of water and spatial planning; or on the provincial level where departments of soil and spatial planning are combined, and also on the municipal level where the engineering and urban development departments have merged. This is also applied in the legal framework where all sectorial acts are brought together into one comprehensive Environmental Act (*omgevingswet*) also in order to simplify procedures and permits. The new Act is under construction and in 2014 the draft texts will be presented.

Flanders approved its Spatial Planning Decree in 1996. Further legal framework consists of a system of plan ‘costs and profits’ as well as ordinances, which are aimed for example at the construction-physical quality of buildings, the thermal and acoustic qualities, the maintenance of the road network, the construction of public utilities, disability access, etc.. These ordinances also can be issued at the three levels; the lower administrative levels have to align themselves with the higher levels.

In Flanders the main legal frameworks for the subsoil known in the Balance4P research at this point are the above mentioned soil protection and brownfield degree. There are also comparable acts considering water, archeology, and other subsoil qualities that are under investigation.

4.2 Binding land-use and other functional regulators

The association of Dutch Municipalities (VNG) publishes *modelverordeningen*: models that set the terms and standard for regulations, which municipalities use as such or adapt to local situation. *Bestemmingsplannen* (Land Use or Zoning Plans) are the key-documents for spatial planning, and in Dutch spatial planning the only document that is legally binding. These plans are rather dominant since the zoning of an urban district then is the base for the building codes that are connected to these zones. These regulations are quite strict preventing for example flexible and mixed use of areas. Each municipality also has a *Welstand* (commission of aesthetics) that assesses the architectural quality of building plans.

For subsurface, different “planning instruments”[22] are available related to the specific use functions of subsurface that are ordered in the categories civil construction, water, energy and soil. In (re)developments and building activities for civil constructions, as well as for unexploded ordnance (UXO), the Archaeological Heritage Management Act has to be taken into account. For UXO there are methods available such as risk maps and methods for detection. Until now, subsurface constructions are treated similarly to above ground and need to meet criteria of Land Use Plans and the Building Act.
Cables and pipes have to be registered in the KLIC system by law.[23] Next to that more (non-legal) data sources with soil information exist, such as *bodemloket* [24] with information on soil quality and www.aardkunde.nl with geomorphological information. In the “information exchange subsurface network act” (WION), all mechanical interventions in the soil (including the application of cables and pipes) have to be reported. Next to that there is a vision for major pipes.[25] Finally, some larger municipalities (Rotterdam) and RWS have their own regulation for the (diversion of) cables and pipes.
The categories of water and energy are both not organized on the local level but are controlled by respectively the Water Boards and Provinces.
In the category soil for soil life / crop capacity there are no “planning instruments”. However, there is regulation on the application of fertilizer and nitrate and phosphate, related with soil quality. Geomorphological quality and diversity and landscape ecology have no planning instruments. In some cases geomorphological values can be part of cultural historical landscapes that can have a protected status (Nature protection act). Provinces can appoint “geomorphological monuments”, however these have no legal status. Excavation of sand, clay, gravel resources is arranged by multiple actors: In most cases provinces en *Rijkswaterstaat* are responsible “excavation act” (*Ontgrondingenwet*) Environmental protection act (Wet *Milieubeheer*)). Municipalities are responsible when *bestemmingsplannen* have to be changed for excavation on land (Spatial Planning Act).

Like in the Netherlands in Flanders the planning instrument on all levels is the structural plan and on the urban district level the *bestemmingsplan.* Part of these plans are based in urban design decrees that are made by Flanders. Until the Urban Design Act (1962) these decrees belonged to the Municipal Law and there was no assessment procedure to see if they were carried out. Building and parcelling decrees made between 1962-2000 had to be checked by the King, and later the Flanders government. Since 2000 these urban design decrees are formalized by the provinces.[26] For changing parcels and changing function of a building a permit needs to be given by the municipality. Other changes can be done without a permit with either the obligation to make you changes know to the municipality, or changes that can be done even without reporting to the municipality.[27]
For subsurface some comparable instruments, without giving the complete picture, in how Flanders deal with water (Water Assessment), soil pollution and for example cables and pipes can be found. Since 2009 by Decree the Flanders region is protecting the cables and pipes in the subsurface. Everybody who wants to excavate needs to put in a plan proposal at the KLIP (*Kabels en Leidingen Informatie Platform*), the platform of cables and pipes that has over 300 members in cable and pipe owners.[30] But again here more investigation must be done.

4.3 Planning process and participation

In the Netherlands, as well as in Flanders, public consultancy on the plan needs to take place before the formal approval. The different levels of government in both countries have a top down method of assessing and influencing spatial plans. Next to that the spatial structure plans are revised/updated through an EIA procedure and an extensive process of stakeholder meetings and public consultation. Participation procedures are regulated at all scale-levels by law. If contesters are not satisfied with the decision at local level, they can re-apply at provincial level and finally in court. For the subsurface procedures are not much different from the above ground. Spatial planning in the subsurface is not arranged separately. The

owner of the above ground is also owner of the subsurface. In the Netherlands only use functions in groundwater and deep subsurface need a permit (from province respectively Ministry of Economic Affairs). “Normal” procedures (possibility to object etc..) apply on these permits. In Flanders this remains unclear.

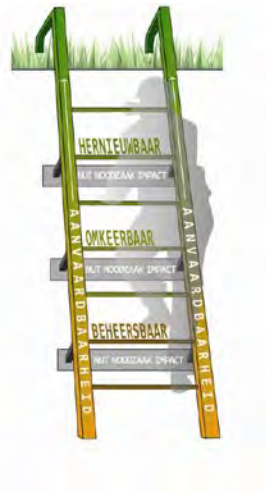
5. Traditional and new planning documents

The Dutch *Bestemmingsplannen* contain at least a map, showing the area concerned; a set of rules and requirements and an explanation. The earlier mentioned *Structuurvisie* can be made at any of the three governance levels and is a common type of document that unites the results of a number of research reports and maps. Statistics and surface-analyses schemes generally inform development plans. Urban and landscape planners and designers frequently make use of drawings and artist impressions to explore scenarios of spatial development. New in the Netherlands are the *structuurvisies* for subsurface (National: STRONG and on province level). Shallow subsurface is arranged in close cooperation with the aboveground in the *Bestemmingsplannen*.

In Europe a major recent development has been the entering in force of the INSPIRE Directive in May 2007, establishing an infrastructure for spatial information in Europe (among which: soil) to support Community environmental policies, and policies or activities which may have an impact on the environment.[31] Following INSPIRE, soil information (not soil quality) are centrally being administered and enclosed in the Dutch *Basis Registratie Ondergrond* (in progress).[32] DINO and BIS give data and information (maps, services) for respectively deeper and shallow subsurface.[33]

In Belgium, spatial structure plans are valid for ten years. They need to consist of three parts: informative, guiding and binding. The structure plans are the framework for Implementation Plans (*Plan van Aanleg*) that can be issued at all three governance levels, depending on the theme. So far, there is hardly any example of integrated subsoil planning.

Case study: Provincie Zuid Holland



The first soil vision by the Provence Zuid-Holland was part of a policy plan about ecology, water and environment (2006). It took another seven years to make the official Soil Vision (2013) that introduces a new approach towards soil, more based on spatial planning. One of the main conditions in order to do that was also by merging the departments of soil and spatial planning in the organization of the Provence. Only a year after this Soil Vision came out a new Structural Vision is presented in 2014, this new policy document integrates completely the former soil vision in its attitude towards soil and integrating it into spatial planning. One major instrument that supports better weighing of soil value and better decision making is the *Bodemladder* (see image). Two main strategies of action are part of this way of working: first that soil use is renewable, and if not that soil can be redeveloped and at last it should be manageable. Second main strategy of action is that all uses should be acceptable.

Especially interesting concerning the introduction of this vision is the Environmental Impact Assessment that had to be done. Whilst the vision is introducing a new approach to soil management, the assessment is done with the more traditional view on soil, only focussing on the remediation aspect. The assessment was not shedding light onto all the positive effects of the new Structure Vision. One positive effect for the soil system that was unfortunately missed was the decision only to develop existing urban areas and no new “greenfield”

expansions. This means that brownfields also will be redeveloped and thus problems of contamination will be tackled. A more controversial aspect of the Structure Vision is the need for cities to densify and become more 'green and blue'. An almost impossible assignment for cities, especially Rotterdam, where the soil system is overcrowded and most surface is sealed.[34] The Municipality of Rotterdam has taken the initiative to deal with this and is working on a Master Plan for the subsoil. They realise that the subsoil is not another domain, but should be just as much part of the spatial planning as the surface of the city. In order to make a connection they use an instrument that belongs to the surface, the master plan, in order to test this on the subsurface.

6. Conclusions

6.1 Main differences and overlaps in planning context.

In comparing the Netherlands with Belgium the first conclusion is that they are incomparable as entities. There is basically is no Belgium with a national planning culture, tradition, laws etc.. Within the project Balance4P and this article the comparison is made between the Netherlands and Flanders. Moreover because the Flanders citizens consider Flanders as their national government. In both the Netherlands and Flanders the most frequently used planning instruments such as zoning plans, building regulations, Environmental Impact Assessment and stakeholder consultations can be found.
For the subsurface several planning instruments have been developed in the Netherlands. National interests in the subsurface will be arranged in the STRONG. For other subsurface functions the provinces or municipalities will be responsible. However, the national government will facilitate the regional-local authorities by the development of decision frameworks, and making data and information available. Flanders has a 'Soil Information Register' and focuses on remediation for brownfield development and has some other comparable instruments like the water assessment and dealing with cables and pipes.
The subsoil thematic is expanding and priorities are changing. For example the mining issues from the 20th century have made way in the 21st century to energy issues such as geothermal heating, CO_2 storage and so on. Cables and pipes are intensifying, the subsoil becomes crowded especially in large and denser communities. For these reasons, it becomes more urgent to plan for subsurface every day. But can this be done in the same way as above ground?

6.2 Possible strategies for integrating with subsoil decision-making

From gathering information and doing interviews about the two planning systems and their subsoil management it already became clear that in both countries planning and subsoil are two worlds, two domains. The experts in one domain have no overview what so ever over the other domain and the other way around. The overview that is sketched in this article is far from complete, and also a task in the continuing research to find out how we can make the overview work best. Why do we need an overview, what is the main goal of this article?

The cable and pipe network is being densified, the subsurface is more and more crowded, especially in intensively used areas. The expanding use of ATES systems and the interferences of diverse subsoil uses are creating more and more problems. One example is the reduction of gas-exploitation in the Northern Netherlands due to increased earthquake risk. Our societies seem to have reached the limits of uncoordinated subsoil exploitation.
Soil pollution and water harvesting have traditionally been related to spatial planning, both during analyses (historical use as an indicator of potential pollution), design (future land-use allocation steered by sanitation remediation requirements) and use (protected areas). On the spectre between 'control' and 'laissez-faire' this could be placed at the control side, based on risk management, for example industry has higher intervention levels than residential area

and ore contamination is permitted. At the same time, spatial planning is moving away from blueprint and land-use *Bestemmingsplan*. And never the two shall meet?

Subsoil elements are now predominately perceived as nuisances for development, however the subsoil landscape also offers opportunities. For example archaeology: delay in planning process, but also potential enrichment of public space (historical landmarks). Integrating knowledge for example in GIS-maps on cables and pipelines, archaeology, explosives, construction-remains and soil conditions is useful for planning, for example to adjust and fine-tune plan economics, and provide data for phasing. Especially a timely initiation of procedures such as sanitation or historical research, may contribute to avoid delays in the planning process.
Beyond the efficiency factor, subsoil elements may be looked at differently. Subsoil constructions, such as caissons and quays, but also larger pipelines: elimination is a cost factor, re-use for foundation, energy-storage and so on may be income generator. The risk-factor is the lack of info on the condition of existing subsoil elements.

One existing instrument that offers input from the subsoil to all scales of development is the Environmental Impact Assessment. Through EIA, synergy between the natural system, the (civil constructed) conditions of the site and plans to develop can be brought together and integrated planning can be reached. From what we have seen in the example of the *Structuur Visie Zuid-Holland* the new soil policy had been taken into the spatial planning, but the positive effects of this new use of the *Bodemladder* was not incorporated in the Environmental Impact Assessment. The case-study demonstrates that the practice of urban development, and the integration of the soil in a sound way, is a matter of lower scale and effective cooperation between people. Maybe the Master Plan of the subsoil in Rotterdam can help in this respect.

Different projects on the connection between spatial planning and subsurface, preceding Balance4P already showed that integrated planning is possible, but it depends on people and how they work and communicate. Is policy able to stimulate knowledge exchange and cooperation? That is a question for further investigation.

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