

WHAT IS YOUR DREAM FOR
THE OUDLANDPOLDER?





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Dear Reader,

In this publication you can find four scenarios for the Oudlandpolder in West-Flanders, Belgium. Four descriptions of how the Oudlandpolder could be in 2050. These scenarios are not predictions of the future. Neither are they wishful thinking in which the best of all worlds is brought together. They are reasoned projections that try to show in words and images how we can deal with space, nature, agriculture and tourism & recreation in this area in the future. They show what is possible if we think things through in four very different directions.

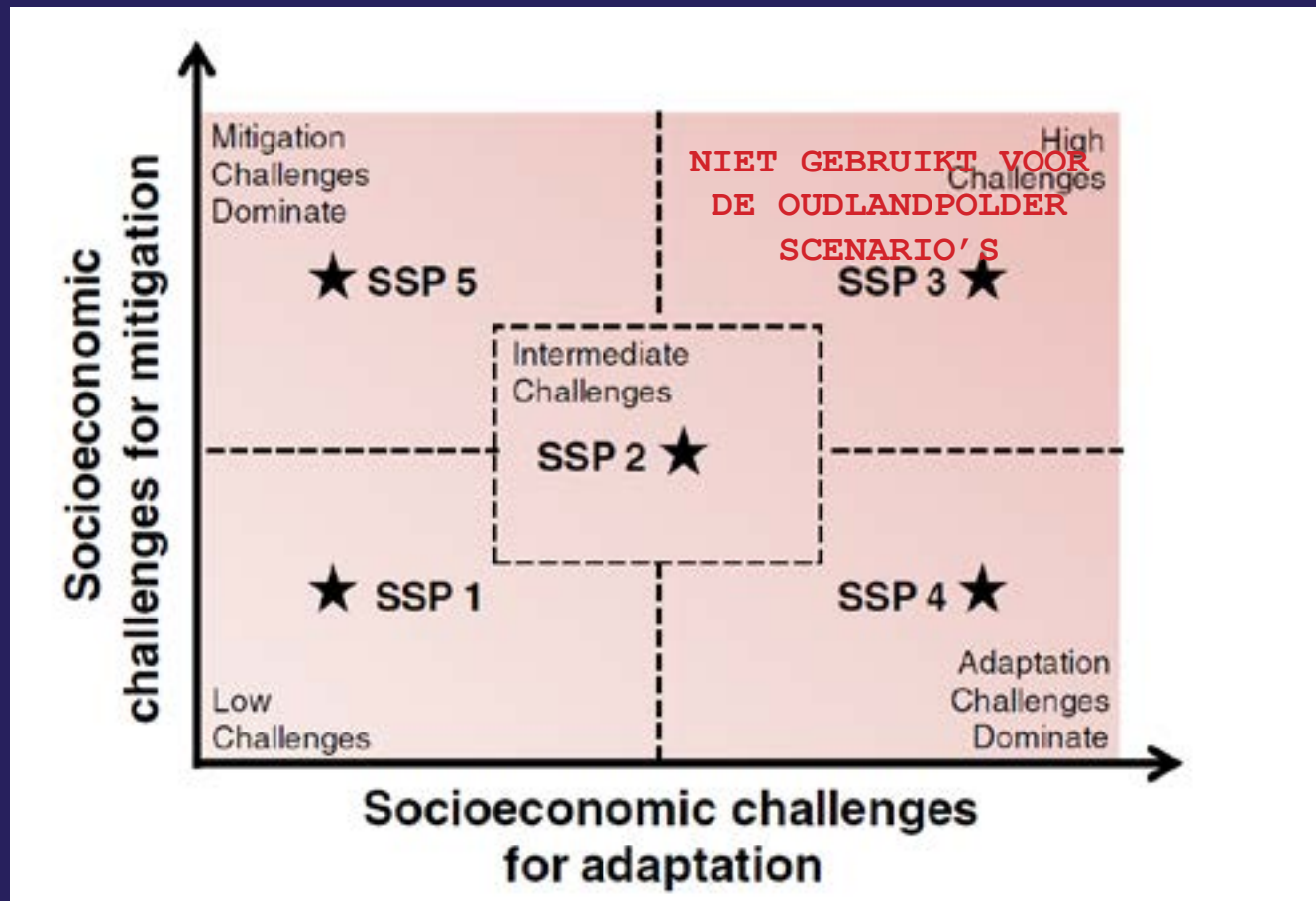
In some respects, the scenarios may seem a bit extreme. Because they are far from the current reality? Because they are very different from each other in some ways? Or maybe because you, as a reader, have a completely different vision on how the Oudlandpolder will develop? Everyone might read these scenarios in a different way. Nevertheless, we hope that everyone will find enough food for thought in them.



A BRIEF INTRODUCTION TO THE SCENARIOS

About these scenarios

While developing these scenarios, we took the **Shared Socio-economic Pathways (SSPs)** as our **starting point** [\(1\)](#). These are reference scenarios developed at supra-national level, that is for e.g. several countries together or parts of a continent. They present a logical and coherent narrative of the social and economic changes that may occur during the coming decades. This means that SSP1, for example, describes that we are moving towards a predominantly plant-based diet, away from fossil resources, and towards a society in which land use is strictly regulated. In SSP5, on the other hand, our meat consumption will not change that much, fossil fuels will continue to be part of the energy mix, and land use will also not be that much more strictly regulated than today. We have not questioned these general trends from the SSPs. You can find them, briefly summarized, in the introductory narrative preceding each of the scenarios. What we have done, however, is to **paint a picture of what these social and economic trends can mean at the level of the Oudlandpolder**. It is important to know that we do not assume that the future outline for the Oudlandpolder automatically says something about the whole of Flanders. For example, it is quite possible that there will still be a lot of cattle breeding in the future Oudlandpolder, while this will no longer be the case in the rest of Flanders.



Bron: O'Neill, B.C. et al. (2014)

Altogether there are 5 shared socio-economic pathways. The most important point where they differ from each other concerns the efforts made at the level of **climate mitigation and adaptation**. With investments in climate mitigation we want to reduce the emission of greenhouse gases. Climate adaptation involves the extent to which we try to adapt to the changing climate. This involves, for example, the decision to grow more drought-resistant crops, to plant trees in order to mitigate heat island effects in densely built areas, or to construct water basins in order to prevent flooding during periods of intense precipitation.

The Intergovernmental Panel on Climate Change examined a few years ago whether it would be possible under each of the SSPs to limit global warming to 1.5°C by 2100 (compared to pre-industrial levels of greenhouse gases in the atmosphere). Indeed, the Paris climate agreement put forward this target as a critical threshold. Under SSP3, this did not turn out not to be the case. [\(2\)](#) Therefore, this scenario is not included here. We are hence working with 4 instead of 5 scenarios.



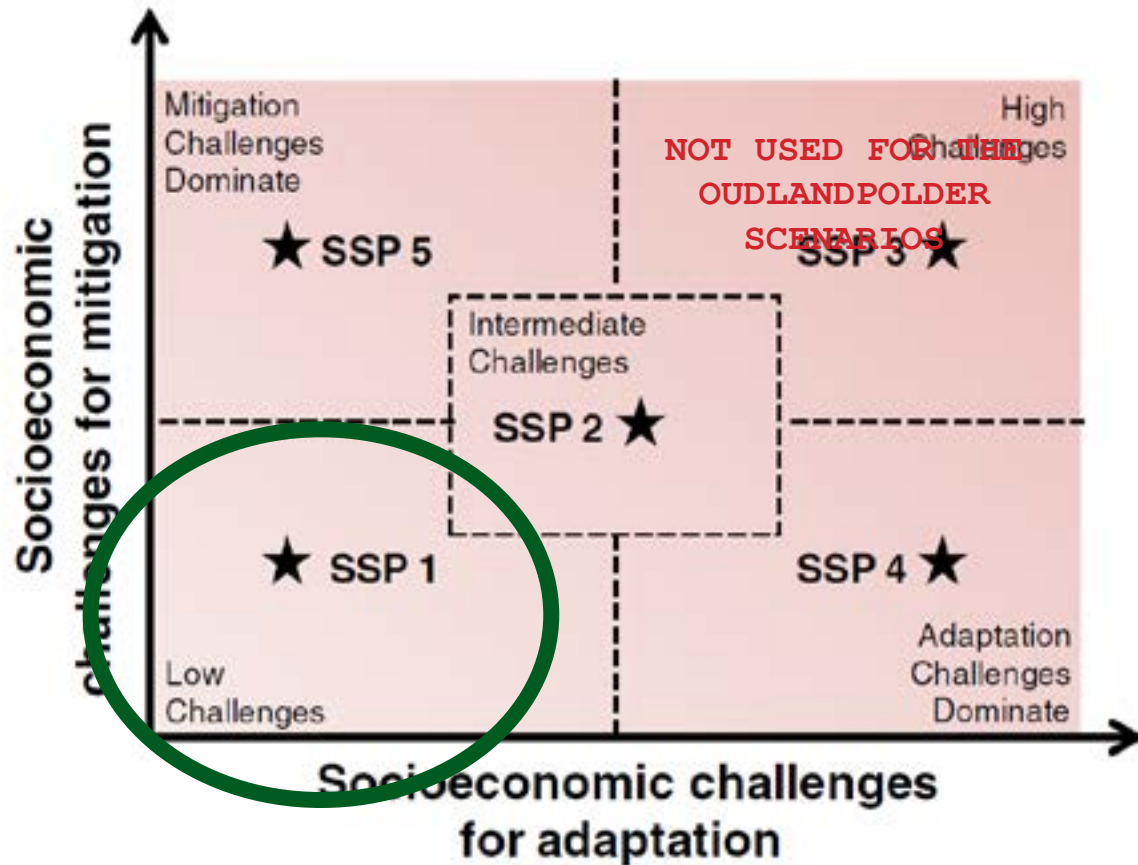
About population growth in the scenarios

The SSPs also provide information with regard to the expected population growth under each of the scenarios. This information has already been converted into concrete figures for Belgium. [\(3\)](#) We have used these figures to get an idea of the population growth that we can expect in the Oudlandpolder. We did this with the help of the Spatial Model Flanders, which we linked to various land use scenarios. These are all existing land use scenarios, which were developed as part of study work for the Flemish government. We selected them because they could easily be linked to the different parameters that are included in the SSPs with regard to urbanization degree and type.

You will notice that the population in the Oudlandpolder will increase (substantially) according to the projections of the Spatial Model Flanders. There is no scenario in which a decrease in population figures can be expected. This is because the urban areas in Flanders are already quite densely populated. Depending on the land-use scenario, the Spatial Model will therefore, to a greater or lesser extent, address the still available (open) space in order to accommodate the 'extra' people who will populate Flanders.



SCENARIO 1: SUSTAINABILITY



Bron: O'Neill, B.C. et al. (2014)

Introductory narrative

For many innovations, the necessary social support develops only slowly in this scenario. There is resistance. And not every innovation leads to the promised results, so that it is sometimes necessary to return to the chosen path. Yet gradually a self-reinforcing process emerges in which one social change acts as a flywheel for the next. **It's a bumpy road: setbacks and successes alternate. But in the end we succeed in sustainably reforming our society.**

The **challenges related to climate mitigation remain manageable** because the relevant authorities - in Flanders and elsewhere - decide fairly quickly to invest in sustainable technologies and institutional reforms. Even though these do not always run smoothly, together with the willingness to work on a sustainable recovery of the environment and economic development based on sustainable urban growth, a brake is being put on further climate deterioration. The **challenges related to climate adaptation are also feasible**, as increasing societal resilience becomes a priority at both the individual and collective levels; and as principles of cooperation and sustainable development guide the reform of institutions and governance systems.



1. LAND USE

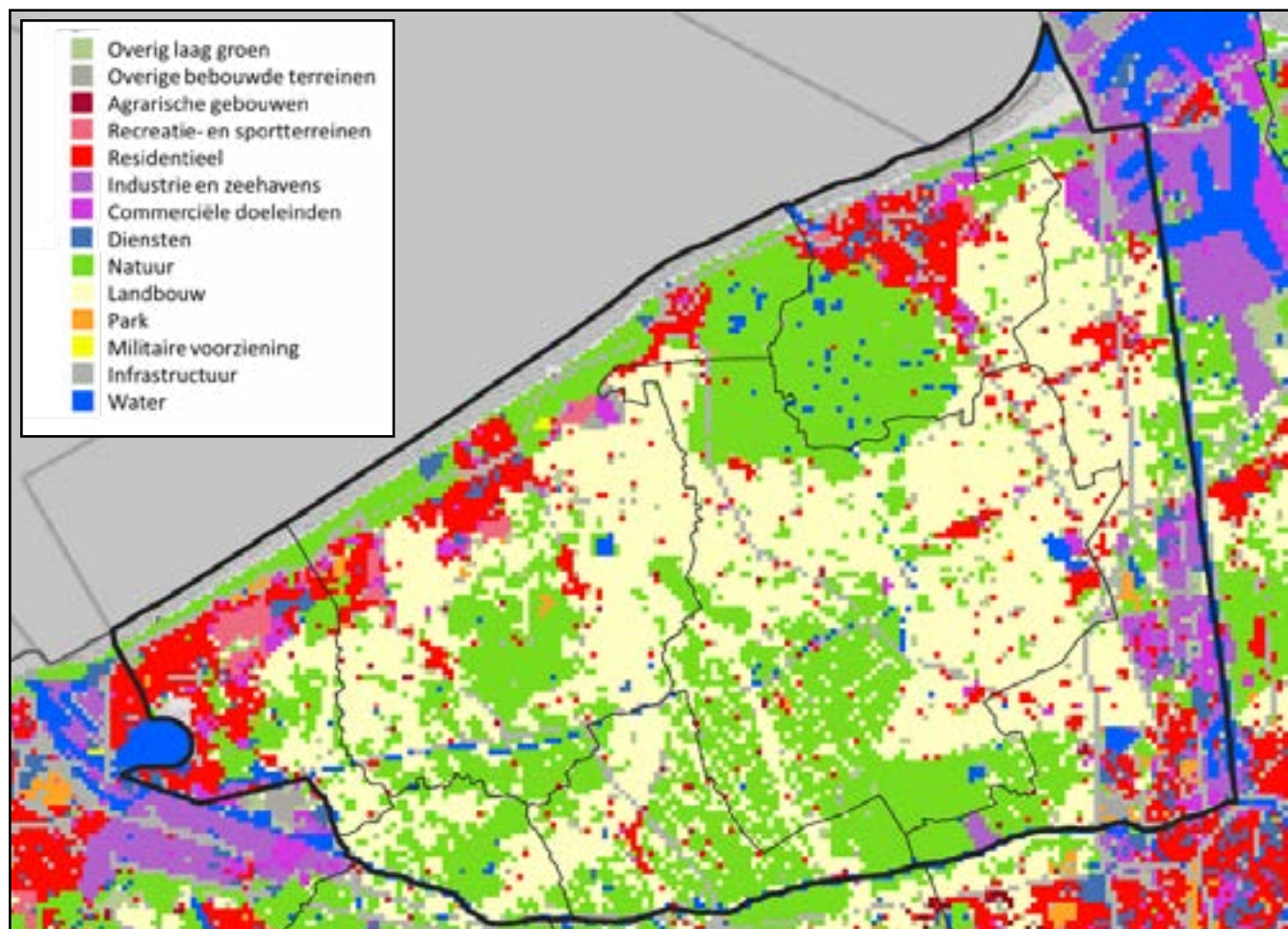
Land use scenario applied here: **anti-urban sprawl**

This land use scenario not only tries to reduce the extra land take in Flanders to 0 ha by 2035, but also to make extra space for nature, agriculture, forestry, ... over time. This results in a relatively large densification of villages, towns and cities.

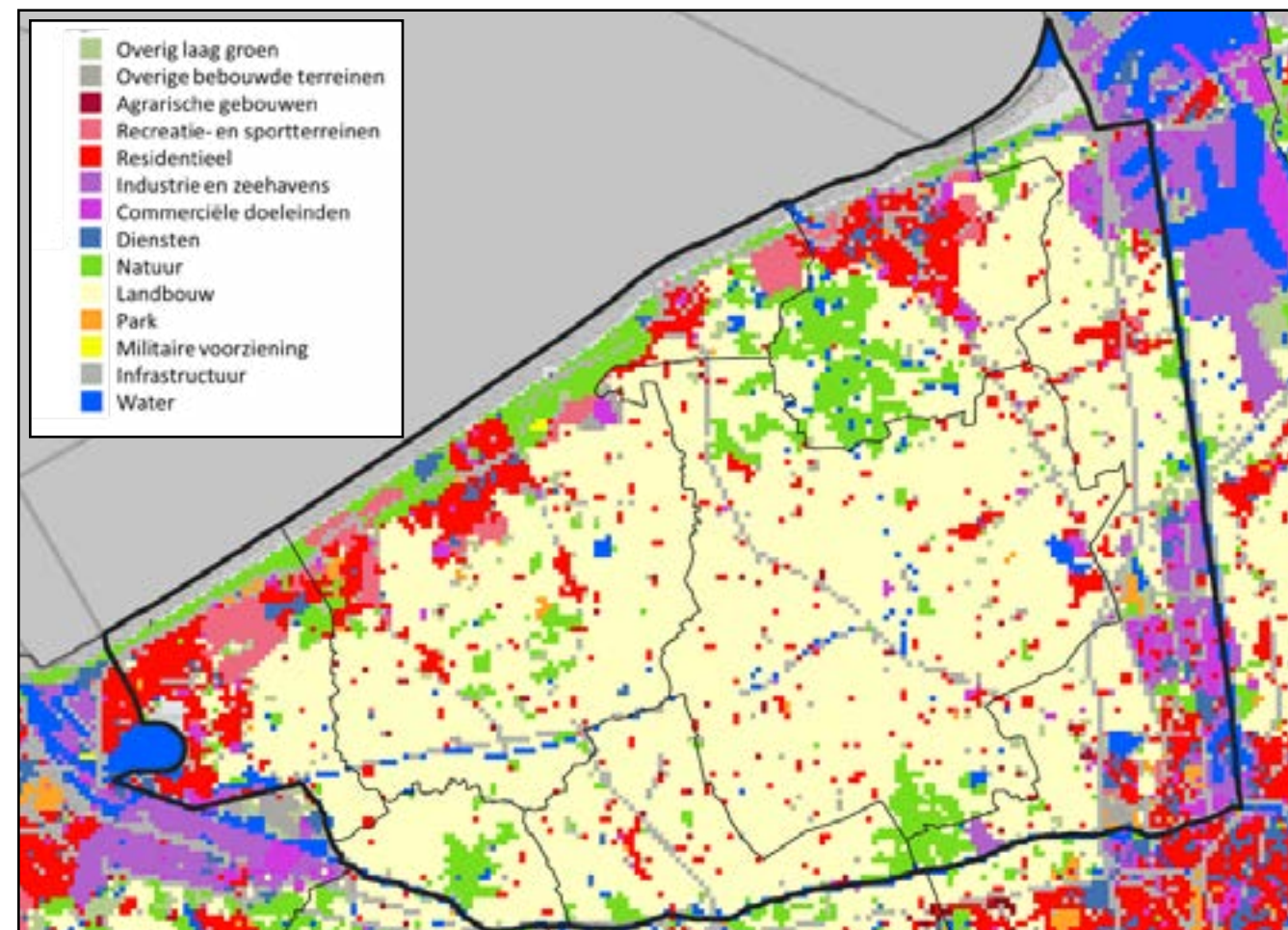
This scenario aligns with a **population growth** from 63,771 inhabitants in 2013 to 80,574 inhabitants in 2050. As a result, the population in the Oudlandpolder will grow by **21%**. Most of this growth is accounted for by the **cities and the large coastal municipalities**.

Gemeenten	2013	2050	% groei
Blankenberge	19 018	26 172	+37,6
Brugge	118 211	145 020	+22,7
Jabbeke	13 648	15 125	+10,8
Zuienkerke	2 793	2 969	+6,3
Bredene	16 534	21 339	+29,1
Oostende	69 068	92 545	+34
Oudenburg	8 926	10 595	+18,7
De Haan	12 425	13 646	+9,8

Land use in the OudlandPolder in 2050 according to the Spatial Model Flanders under the land use scenario 'anti urban sprawl'.



For comparison: Space use in the Oudlandpolder in 2013.

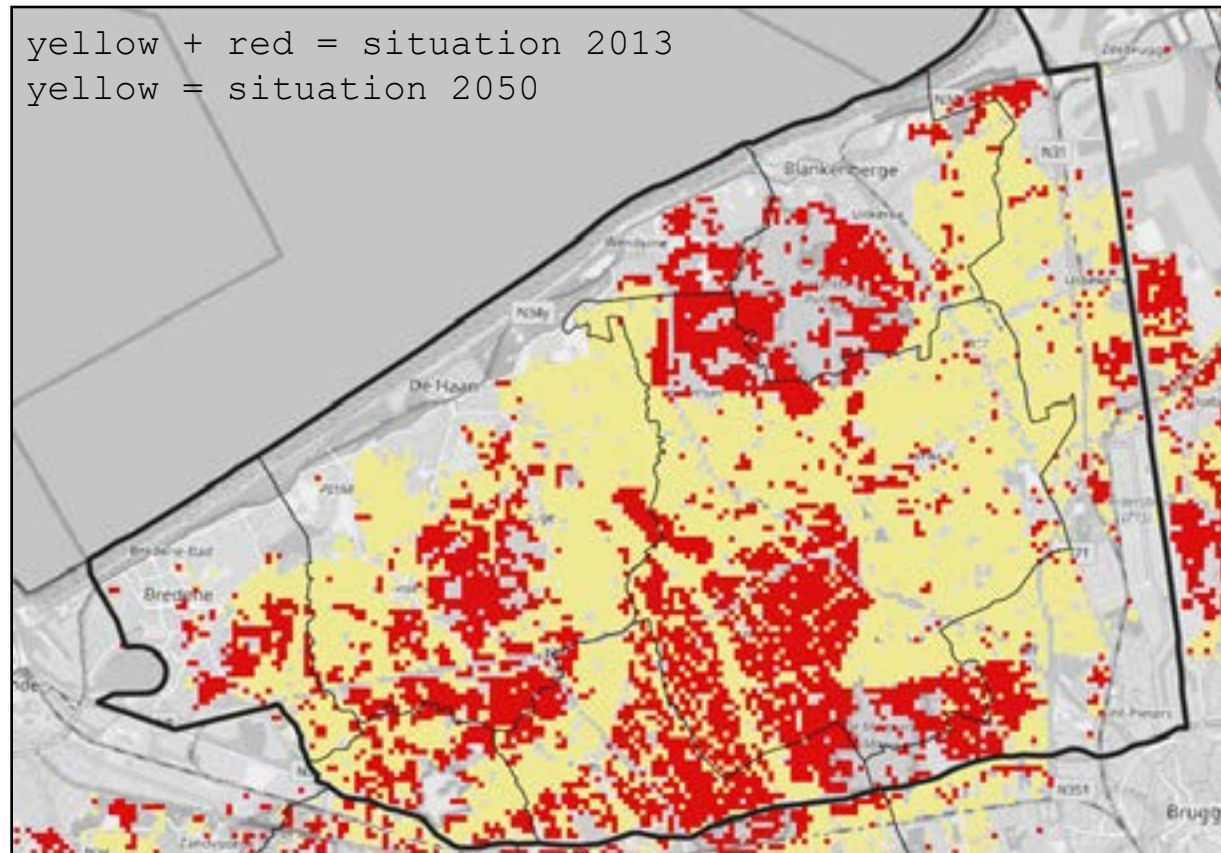


2. AGRICULTURE

Where does farming take place?

On the difference map below, all the agricultural area is colored. By agricultural area we mean here:

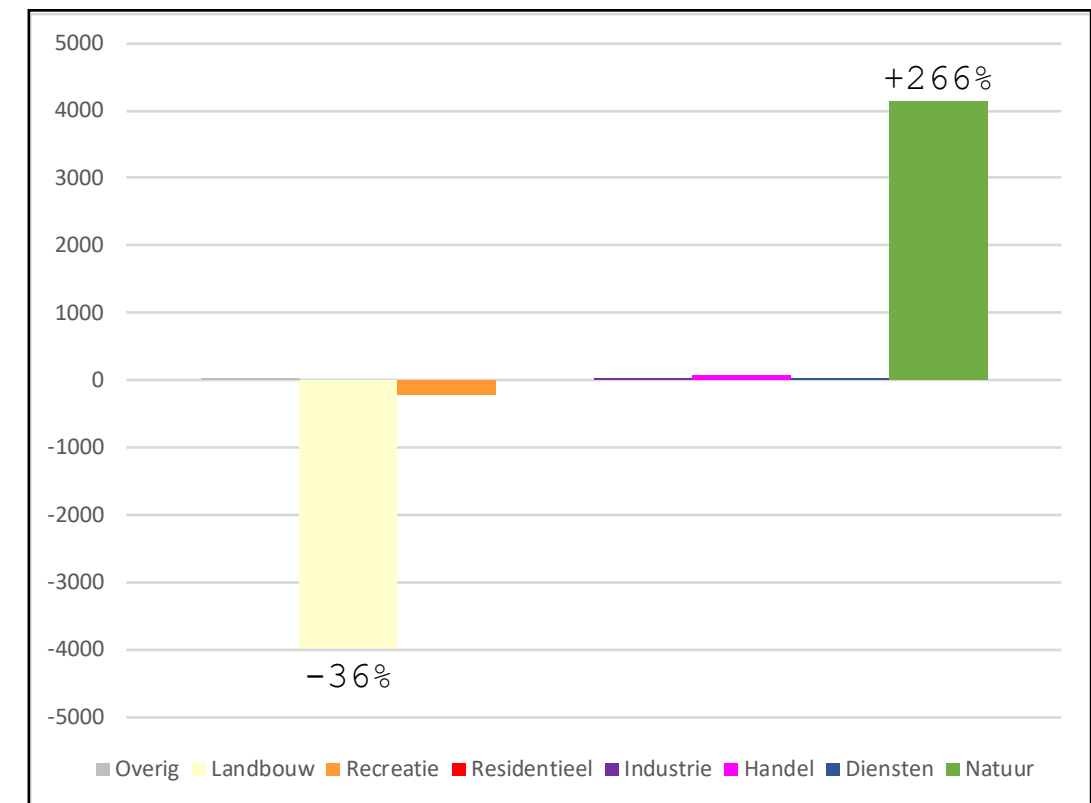
- **crop fields, production grasslands and orchards declared to the government for income support [\(4\)](#).**



- **non-registered agricultural land:** fields and biologically low-value grasslands that are not registered with the government for income support, management agreements or under environmental legislation (e.g. manure policy). In practice, these are plots for hobby farming, horse and sheep pastures and all kinds of rough grazing.

- **agricultural buildings**

This enumeration shows that e.g. grasslands in nature management, for which income support is applied for, are also presented here as agricultural areas.



Future farms

- **Family farms:** Arable farms, extensive livestock farms and mixed farms.
- **Local agriculture:** Mainly production for customers from the surrounding urban areas and inland; export to foreign countries only represents a small part of turnover.
- **Cost reduction:** Less labor-intensive than today, less fertilization, animals with low vet costs, fewer pesticides, use of residual streams, etc.
- **Exclusive products,** such as salty cows, refined cheeses, organic grains, etc. sold with a (quality) label.
- **Profitable farms,** partly through broadening and new business models: Farmers also derive income from nature management (water management, carbon storage in soils, extensive livestock farming on grasslands, etc.), farm tourism, care farms, farm classes, summer camps, etc.
- **Digital farms:** Where needed, farmers are assisted by digital systems (e.g., monitor soil moisture, track water quality, track weather conditions, etc.)
- **Fully electrified:** Tractors and other implements are driven electrically, stables are heated by electricity, etc.
- **Conservation and restoration of the typical polder farms.**

Future agricultural practices

- **Land-based agriculture mainly focused on vegetable production:** In the Oudlandpolder, cereals, sugar beets, protein crops, flax, potatoes, ... are grown in the Oudlandpolder.
- **Crop schemes adjusted to natural conditions** determined by water availability and soil conditions throughout the year.
- Large blocks of farmland are divided up by inserting **natural elements:** Canals with natural banks, ruins, flower strips, nature play, etc. are long-term and structurally managed by farmers.
- Maximum use of **nature-based solutions,** so that the use of pesticides, artificial fertilizers, antibiotics, etc. can be reduced to a minimum, thereby **going beyond the targets formulated by the European Farm to Fork Strategy.** This means: more than 20% reduction in the use of fertilizers, more than 50% reduction in the use of pesticides, and more than 50% reduction in the use of antibiotics.
- **Increased productivity** per ha and per euro invested: Underlying this are new crops, cultivation methods, and other technological and non-technological innovations.
- **High innovation transfer rate:** New crops, cultivation methods, techniques, ... from home and abroad are quickly and widely adopted in the Oudlandpolder.



A quick comparison with the chapters about agriculture in the other scenarios? Click on one of the following links:

[not choosing is losing](#)

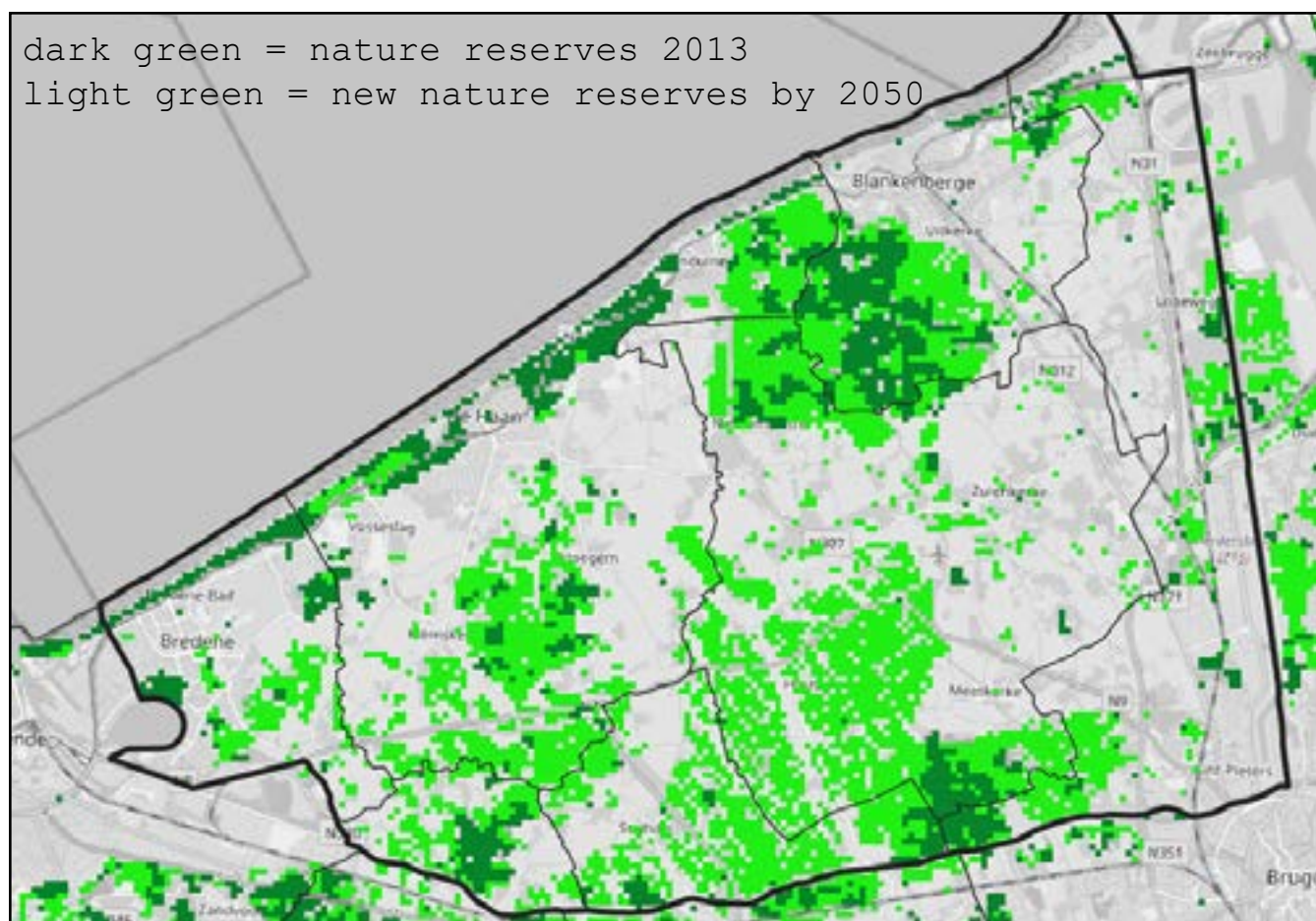
[structural inequality](#)

[technological optimism](#)

3. NATURE

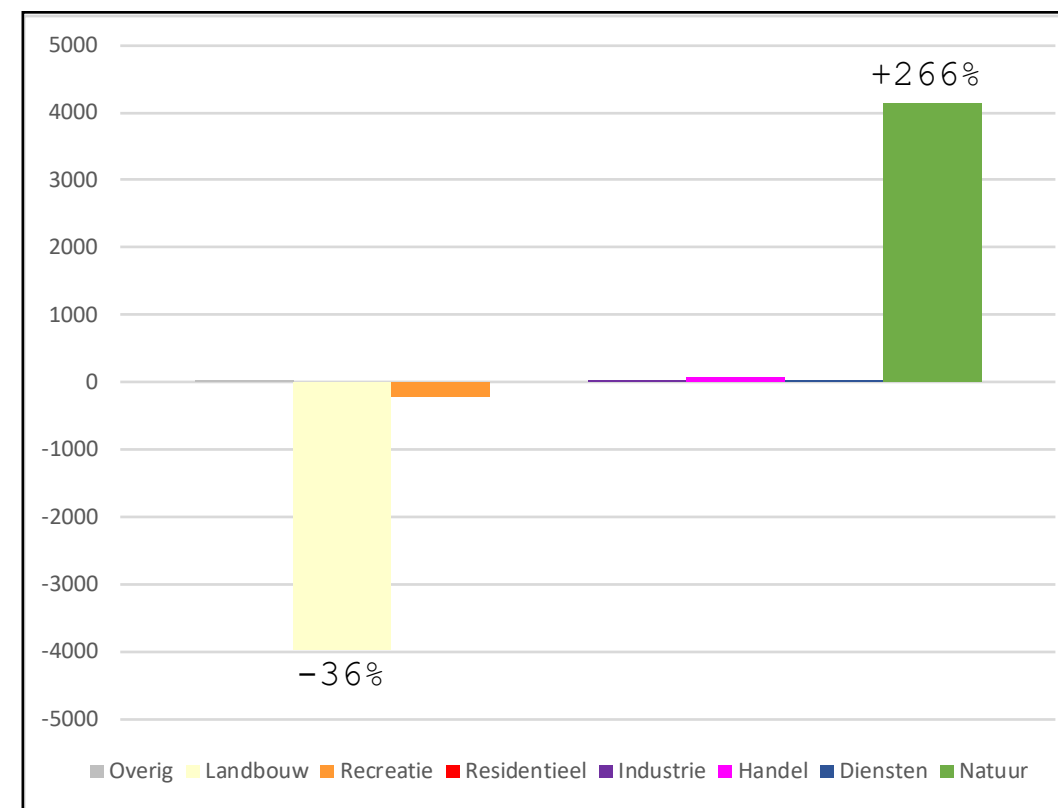
Where are the nature reserves located?

On the difference map below, forest, dunes, mudflats and salt marshes, natural grassland and marsh are categorized as nature.



The principle followed in creating additional nature in this scenario:

Restoration of wetlands by 86% (reference point: status 1950s 20th century), that is **creating wetlands with high biodiversity**, according to the 'open (not forested) landscape scenario' (5). In this scenario, the landscape in the Oudlandpolder is kept open using **extensive agricultural practices** (e.g. extensive grazing) and **conservation** (e.g. mowing). The average groundwater level in these wetlands is close to ground level, no pesticides are used, and only a minimal amount of fertilization.



Nature reserves

- **Large areas where fauna and flora are left alone as much as possible:** Only minimal management measures are still carried out in these areas, such as the targeted introduction of species to restore biotopes, cyclical grazing management, mowing or the construction of rainwater ponds. This allows vulnerable, complex ecosystems to continue to expand, creates a sufficient breeding habitat where species are not disturbed, and creates a rich foraging habitat.
- **Large, open, contiguous pasture landscape** with sufficient variation to provide a home for thriving populations of meadow birds (lapwing, avocet, etc.) as well as for populations of free-ranging geese to survive the winter.
- **Water management designed to meet ecosystem requirements,** e.g. flood control, extensive compartmentalization, seepage pipes, etc. allowing e.g. the saline vegetation on the polder grasslands to increase.
- Areas with reed marsh, sedge vegetation and brushwood have expanded significantly.
- **Outside the zones where recreation is prohibited, the nature areas in the Oudlandpolder are optimally accessible for quiet recreation.** There will be an extensive network of walking and cycling paths, canoe routes, picnic places, observation towers and walls, and information boards that provide in a playful manner digital access to the nature and agriculture in the area.

Professionalisation nature management

- **Nature management carried out by certified persons who have received the necessary training for this.** These can be employees of nature organizations, farmers, employees of competent authorities, etc.
- **Continuity in the build-up of expertise with regard to agriculture and nature management in polder areas.** Nature lovers and recreational users can visit a **visitor center** for the OudlandPolder, which at the same time has developed an **educational function** that goes beyond the borders of the OudlandPolder. Thanks to the **scientific support** that this center can rely on, it also functions as a **training center** for all agricultural and nature professionals who are active in polder areas.
- **Nature management linked to earning models that value ecosystem services in the Oudlandpolder** so that nature management provides a decent income for those who contribute to it, e.g. carbon storage in soils, sustainable water management, climate regulation, increased populations of pollinators, natural pest control, etc.





A quick comparison with the nature chapters in the other scenarios? Click on one of the following links:

[not choosing is losing](#)

[structural inequality](#)

[technological optimism](#)

4. TOURISM & RECREATION

What makes the Oudlandpolder attractive for tourists?

- **It is beautiful:** an **open and varied landscape** in which fields, meadows, nature reserves, picturesque polder villages, beautiful views and traditional farms alternate. You will find peace and quiet, history and an outlook on a sustainable future, making it a pleasant place to stay, cycle and walk.
- **You can eat and drink well here:** Scattered throughout the polder, both in farms and villages, there are **typical eateries**, ranging from terraces where a drink is available to some **star-rated restaurants**. Many farms also have a farm store where **local specialties** can be tasted and purchased. This gastronomic offer is made available through various accessible formulas.
- **It is a child-friendly environment:** An integral offer has been developed for children and young families, consisting of vacations on the farm, 'polder classes', nature play, child-friendly cycling and walking paths, etc.
- **There is a wide range of facilities for the disabled.**



- **Accessible via an extensive network of bicycle and hiking trails.** There are also a lot of possible on the water for people who want to explore the Oudlandpolder by kayak or canoe.
- **A diverse range of accommodation types** that can appeal to culture and nature lovers as well as families, recreational cyclists, hikers and other possible target groups.



By investing in making the Oudlandpolder attractive to tourists ...

... residential tourism has increased in the polder, all year round. Following the rhythm of the seasons, the polder attracts other tourists: nature lovers who want to dive into the rich reserves, culture lovers who want a quiet, rural base to visit Bruges, recreational cyclists, families with children, etc. The Oudlandpolder is becoming a popular place for both short and long vacations. This translates into a sharp increase in the total number of overnight stays and the length of stays.

... the number of recreationists in the area is increasing sharply: hikers, bird spotters, recreational cyclists, culinary enthusiasts, senior citizens who want to enjoy a pleasant terrace, etc.

... quiet recreation and residential tourism are becoming an important pillar in the regional economy. However, it cannot be separated from other economic activities in the polder. Firstly, because the added value of the region in terms of tourism and recreation is mainly created by other sectors, such as agriculture and nature. On the other hand, the tourism and recreation offer mainly comes from the broadening of activities within other sectors.



A quick comparison with the tourism chapter in the other scenarios? Click on one of the following links:

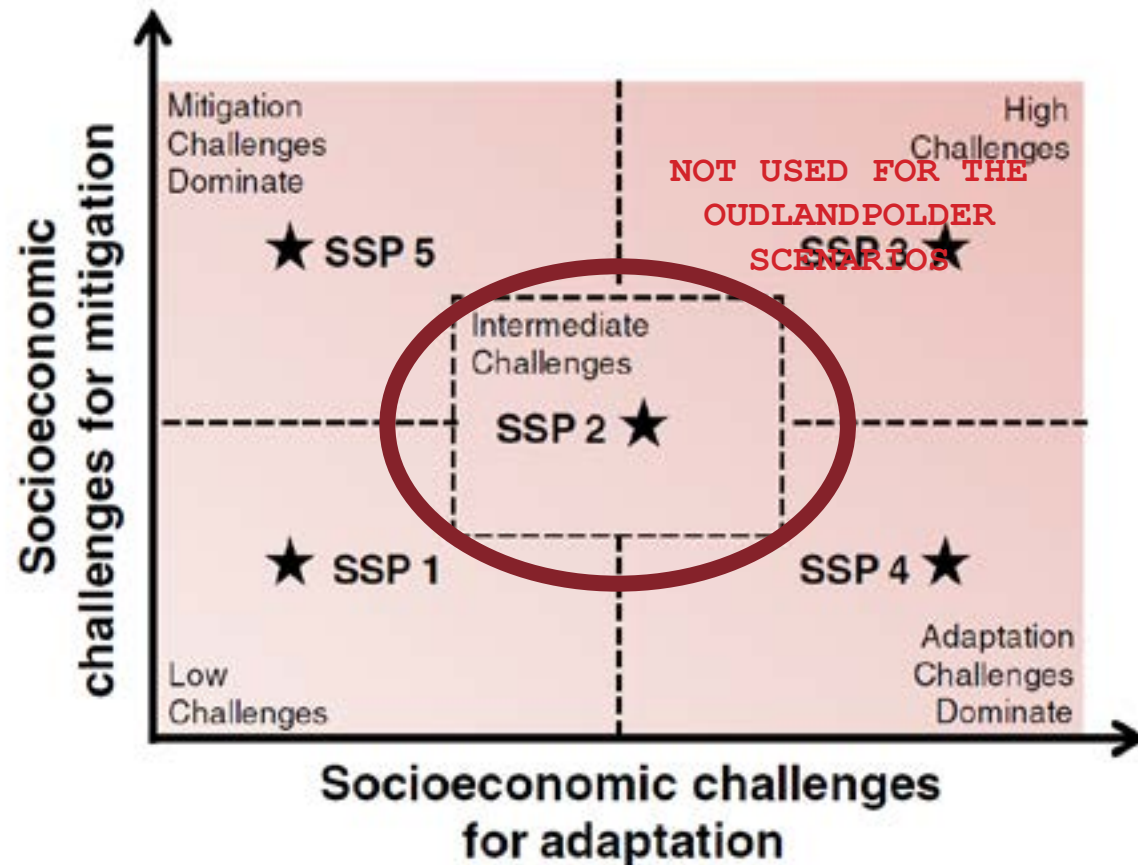
[not choosing is losing](#)

[structural inequality](#)

[technological optimism](#)



**SCENARIO 2:
NOT CHOOSING
IS LOSING**



Bron: O'Neill, B.C. et al. (2014)

Introductory narrative

The trends observed today in the social, economic and technological domain will continue in the coming decades. There will therefore be **no real break in our thinking and acting** compared to today. One consequence of this is that, in this scenario, socio-economic developments, just as they do today, may differ greatly not only between countries, but also between regions.

In terms of **mitigation**, this scenario leads to a society in which the **costs and efforts to reduce greenhouse gas emissions are 'average'**. This is because fossil raw materials are still being used to a limited extent, the transition to sustainable cities does not fully materialise, the (technological) innovation potential in the energy and agricultural sectors remains underutilized, and there is insufficient (inter)national cooperation to address environmental problems. In terms of **adaptation**, **costs and efforts are also expected to be 'average'** in this scenario. Challenges to addressing social resilience include population growth, growing social inequality, urban growth - including in vulnerable areas such as flood prone areas - and limited social cohesion.



1. LAND USE

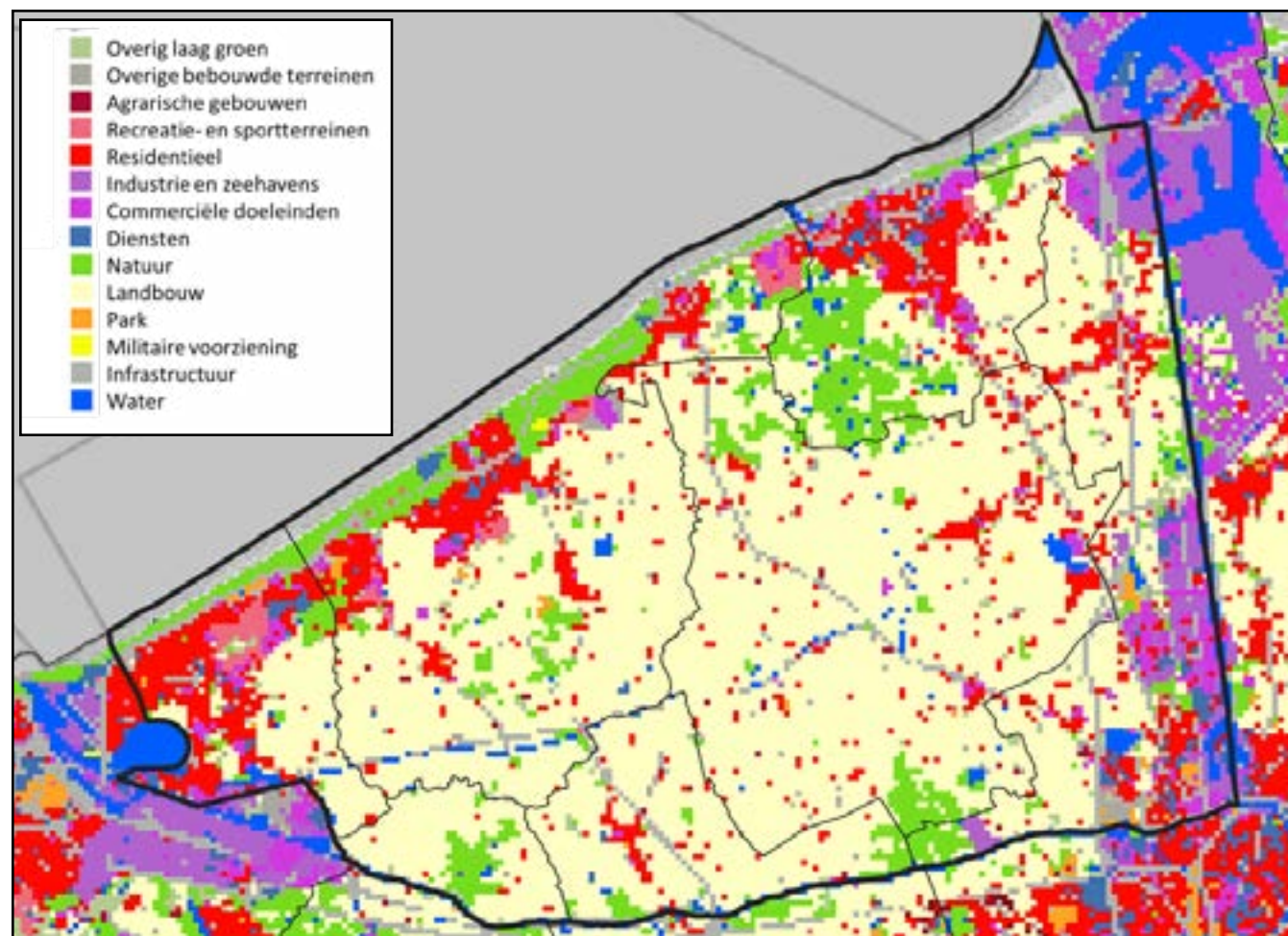
Land use scenario applied here: **business as usual**

Land use in this scenario will increase in proportion to population growth. Relatively speaking, more housing, commercial premises, restaurants, etc. are added in the cores than in the outlying area. Compared to growth as usual (the land use scenario applied in the next scenario), the densities in the cores are therefore higher in this scenario.

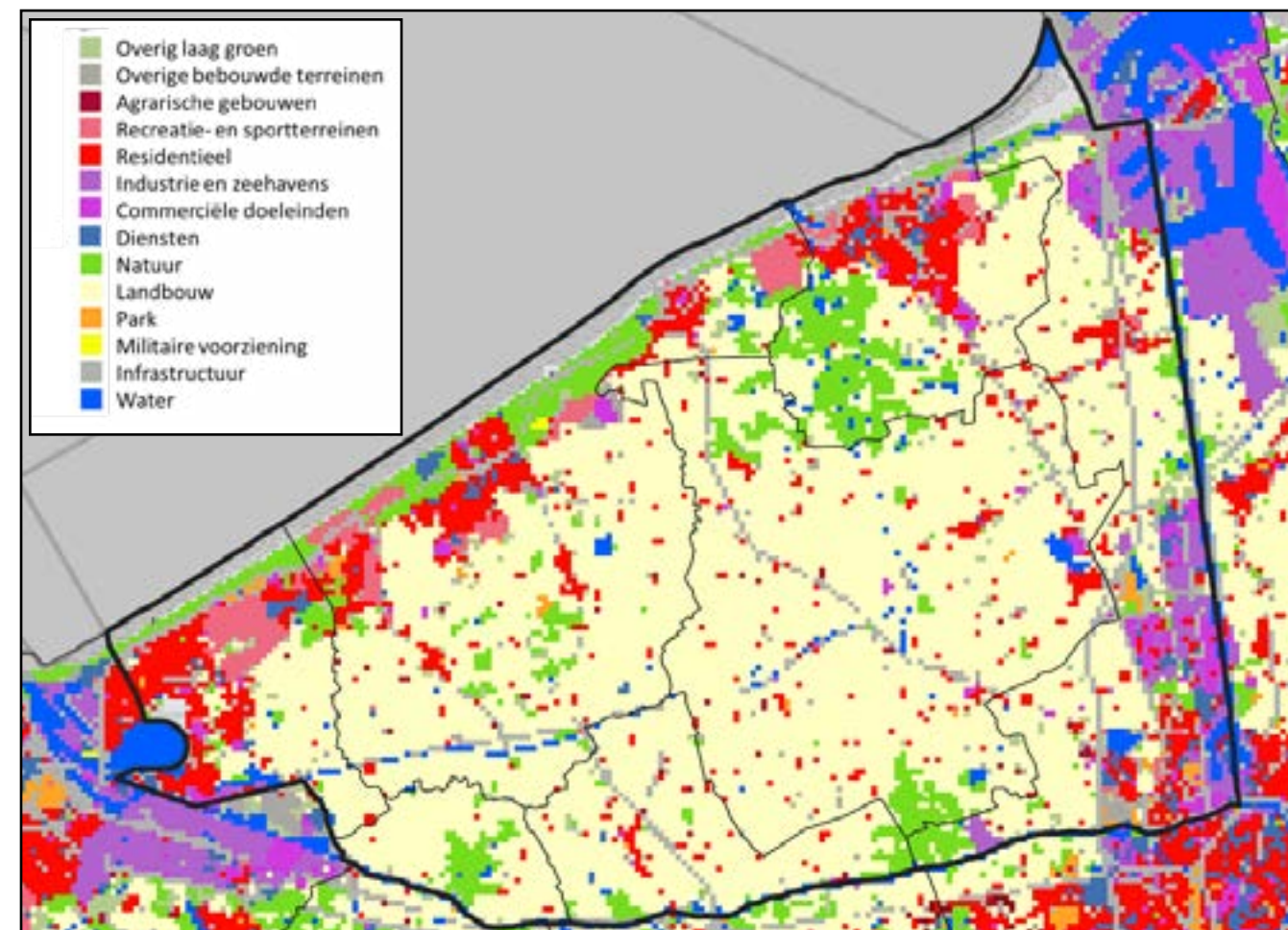
This scenario aligns with a **population growth** from 63,771 inhabitants in 2013 to 73,612 inhabitants in 2050. As a result, the population in the Oudlandpolder will increase by **11%**.

Gemeenten	2013	2050	% groei
Blankenberge	19 018	20 913	+10
Brugge	118 211	127 173	+7,6
Jabbeke	13 648	18 089	+32,5
Zuienkerke	2 793	4 543	+62,7
Bredene	16 534	18 049	+9,2
Oostende	69 068	72 285	+4,7
Oudenburg	8 926	12 582	+41
De Haan	12 425	14 424	+16,1

Space usage in 2050 in the Oudlandpolder according to the Spatial Model Flanders under the land use scenario 'business as usual'.



For comparison: Land use in the Oudlandpolder in 2013.



Future farms

- Especially **family-owned mixed farms** that produce for the Flemish and European market. They have access to foreign channels that provide a significant proportion of their sales.
- Building on the unique (saline) location and excellent quality of their products, **a significant proportion of farmers can work with an origin and/or quality label**. For example, at least 25% of the farms also offer products with the organic label
- Relatively **large businesses owned by agro-industrial businesses** are also found in the Oudlandpolder. Even though their **number remains limited**.
- The development of **a profitable agricultural business is a challenging balancing act**, in which evolutions on international markets, environmental restrictions, para-agricultural activities (contractor work, storage sheds, etc.) and investment choices with regard to innovations, scaling up and expansion into health care and tourism play a role.
- **Digital businesses**: Farmers are supported by IoT systems, satellite data and agriculture-specific models.
- **Fully electrified**: tractors and other implements are driven electrically, stables are heated by electricity, etc.
- **Preservation of a number of typical polder farms**.

Future agricultural practices

- **Approximately the same production ratios as today**. This means that about 40% of the total cultivated land is exploited as grassland. 60% is arable land. Many cereals are grown (23%), industrial crops (14%) and corn (12%).
- **Pesticides, fertilizers, antibiotics and other chemical additives** are applied 'on demand' even more than today. As a result, the use of these chemicals is dropping significantly: 20% less fertilizer, 50% less use of pesticides and 50% less use of antibiotics.
- **On average, plots of land have become larger**. Sometimes they are surrounded by natural elements (canals with natural banks, reed beds, etc.).
- New technologies, cultivation methods, etc. do find their way to the Oudlandpolder, but **innovation could often go much faster**.
- In the absence of radical and large-scale innovations in the agricultural sector in this scenario, **agricultural practices** do have a **smaller impact on the environment** than in 2020, but still **ecosystems cannot be prevented from deteriorating further**.
- **Grasslands are used quite intensively** (grazing, fattening, mowing,...), unless they have a special protection status.



A quick comparison with the chapters about agriculture in the other scenarios? Click on one of the following links:

[sustainability](#)

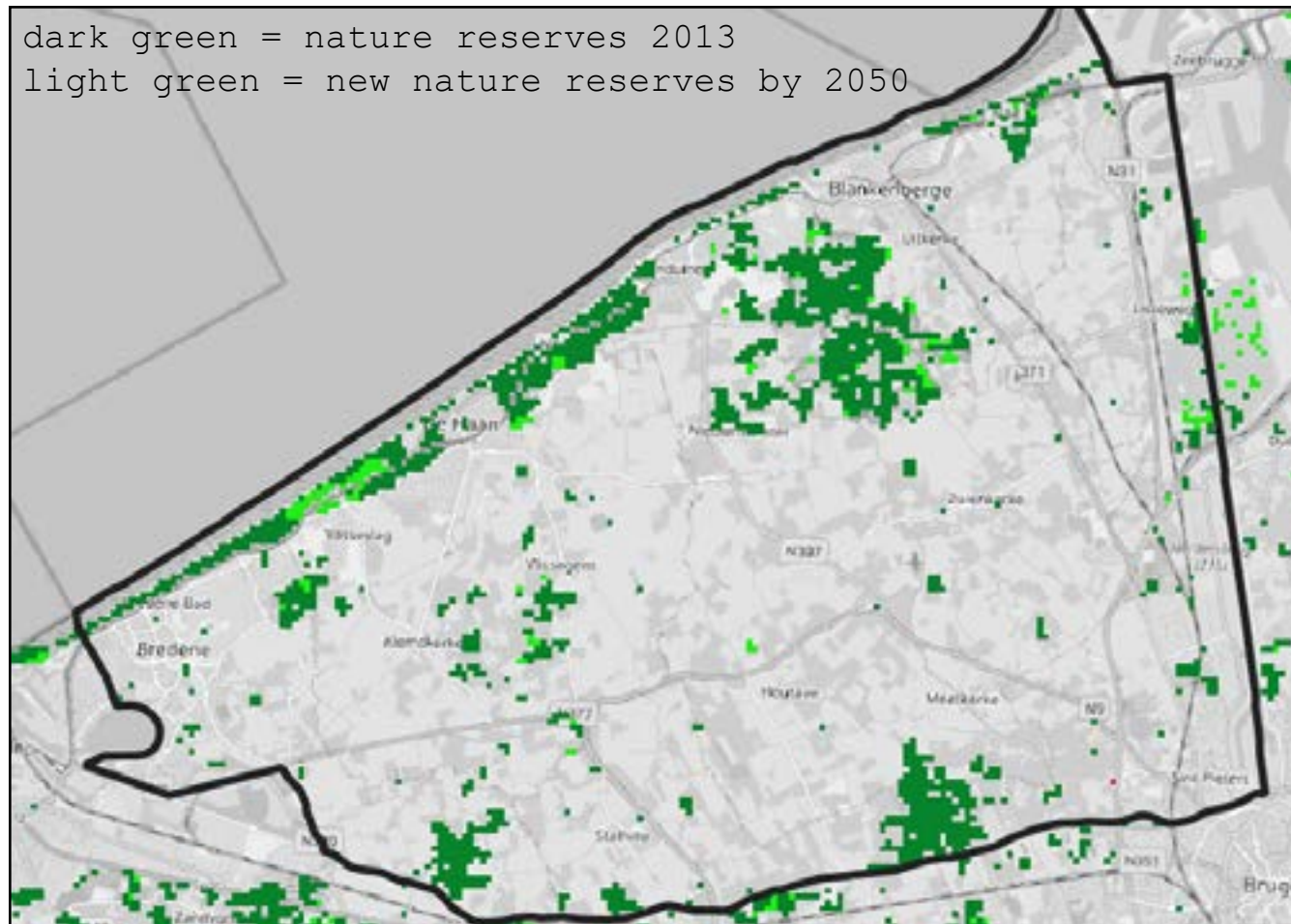
[structural inequality](#)

[technological optimism](#)

3. NATURE

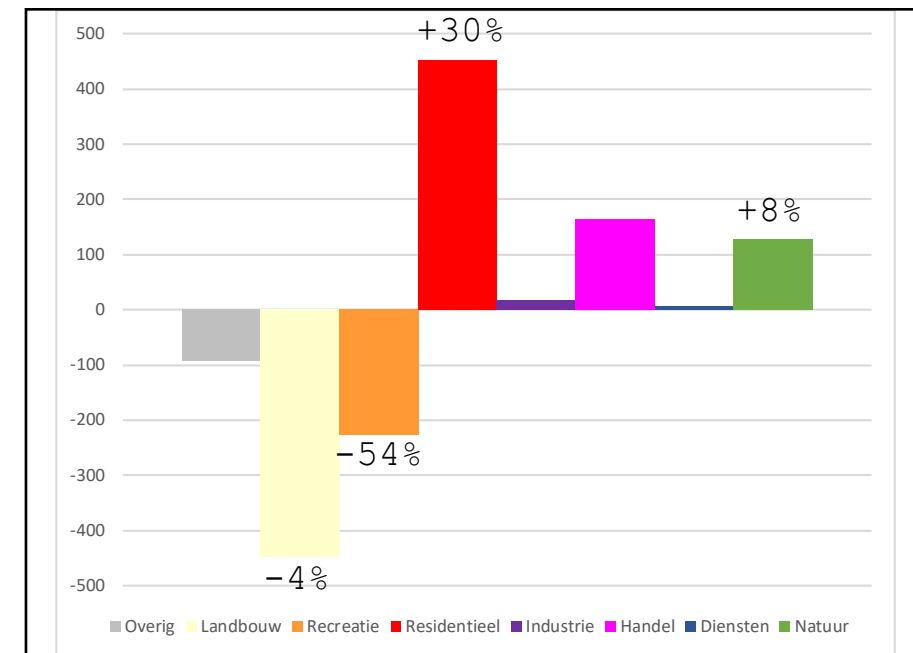
Where are the nature reserves located?

On the difference map below, forest, dunes, mudflats and salt marshes, natural grassland and marsh are categorized as nature.



The principle followed when creating additional nature in this scenario:

- **Already planned nature expansion in line with the conservation objectives becomes reality.** This means that in 2050 17% of the wetland area from the 1950s will still be conserved.
- **Outside the natural areas,** that is in agricultural areas, recreational areas, residential areas, etc., **slightly more natural elements** will be created than today. Unfortunately they **do not form a continuous natural network** that connects the various nature areas.
- In some places, polder watercourses are widened with natural banks. But this is not done systematically.



Nature in the Oudlandpolder

- **Small expansion of natural areas.** In the coastal strip the changes are relatively larger than in the polder, because dune restoration was carried out in certain places.
- The number of farmers entering into management agreements increases slightly compared to 2020. As a result, **fragments of nature are also maintained outside the nature reserves:** natural field edges with flowers and herbs, reed beds, canals with natural banks, etc. However, it is **not always possible to offer sufficient continuity:** nature development depends on the willingness of farmers to enter into management agreements and to extend them time and again.
- Due to the lack of far-reaching measures to solve the water problems in the polder, the demand for fresh water in dry periods continues to exceed supply. This, in combination with other stress factors such as hot summers, floods, disease outbreaks, etc., results in a **further deterioration of the natural areas and a decrease of biodiversity.**
- The **quality of the surface water in the polder improves** as a result of the sharp reduction in the use of pesticides and artificial fertilizers, among other things.
- Nature reserves are opened up for hikers and cyclists in a way similar to how it is done now.

Nature management with the help of volunteers

Nature management in the Oudlandpolder depends heavily on the efforts of **volunteers**. **Farmers**, for example, who, out of love for their polder, voluntarily enter into management agreements to sow flower strips, maintain historically permanent grasslands, maintain canals, etc. The competent authorities and nature organizations also lack the resources to gear their nature management optimally to the nature objectives set, and therefore depend heavily on the efforts of **citizens** who volunteer to help carry out all the necessary works.





A quick comparison with the nature chapters in the other scenarios? Click on one of the following links:

[sustainability](#)

[structural inequality](#)

[technological optimism](#)

4. TOURISM & RECREATION

The potential is better exploited than in 2020.

Thanks to better cooperation between competent (government) services and a clear policy framework, accompanied by the necessary investments, the recreational and tourist potential of the Oudlandpolder will be further unlocked. **There will be more signposted walking and cycling paths, mountain bike routes and bridle paths, places to eat and places to stay overnight, and all of this will be linked to a clear information and communication strategy.** On beautiful vacation days, the Oudlandpolder can welcome many cyclists and hikers who can go out and appreciate nature, have a drink in one of the polder villages or enjoy the landscape while cycling. In the tourist season, stay-away tourism has also increased compared to 2020.

Yet it could still be better. There would be more to come from a spatial and heritage policy that values the open landscapes, restores the polder villages and better protects traditional polder farms and other heritage elements. Also, the multimodal transport network in the area is not sufficiently developed. The frequency with which buses run could be better. Just as there could be a few more points where visitors can switch to partial mobility. Furthermore, the polder does not yet have much to offer to target groups with special needs, such as children and the disabled.





A quick comparison with the tourism chapter in the other scenarios? Click on one of the following links:

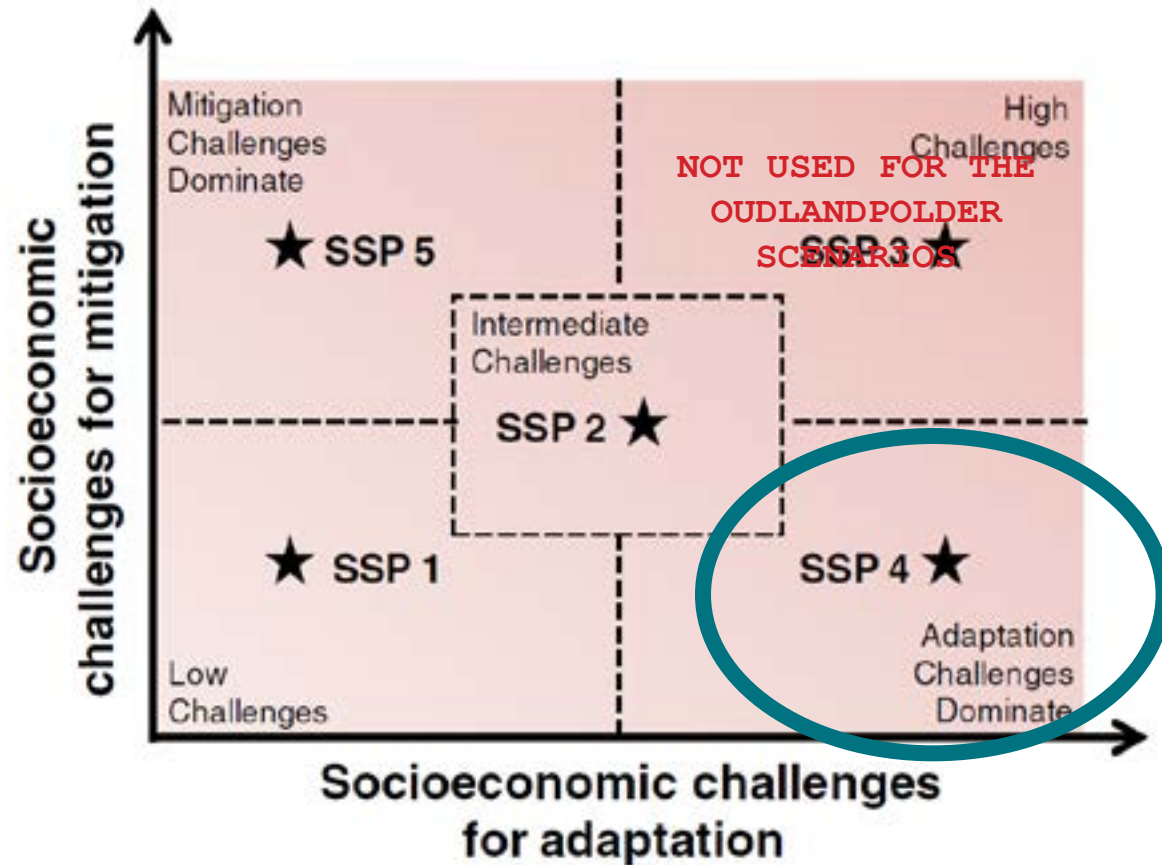
[sustainability](#)

[structural inequality](#)

[technological optimism](#)



**SCENARIO 3:
STRUCTURAL
INEQUALITY**



Bron: O'Neill, B.C. et al. (2014)

Introductory narrative

In this scenario, **inequality between countries, but also between regions, increases substantially**. The main reason for this is the unequal distribution of economic growth, which is the continuation of a trend that was also observed already at the beginning of the 20th century. **Prosperity and power are concentrated among an ever-shrinking minority**: those who can begin their life with a prosperous start. Most of the people, however, only see their socio-economic situation deteriorate - also in Flanders. In terms of innovation, for example, this means that mainly the high-tech sectors are reaping the benefits of further technological development, as are highly educated people.

The combination of, on the one hand, the development of economic activities with a low carbon footprint and, on the other hand, an international political and business elite that dares to take quick and well-considered decisions, results in **relatively low mitigation costs**. The challenges and **costs** associated with **adapting** our societal systems to the changing climate, on the other hand, are **great**. This is because a relatively large portion of the population has little or no access to the resources needed to make necessary changes.



1. LAND USE

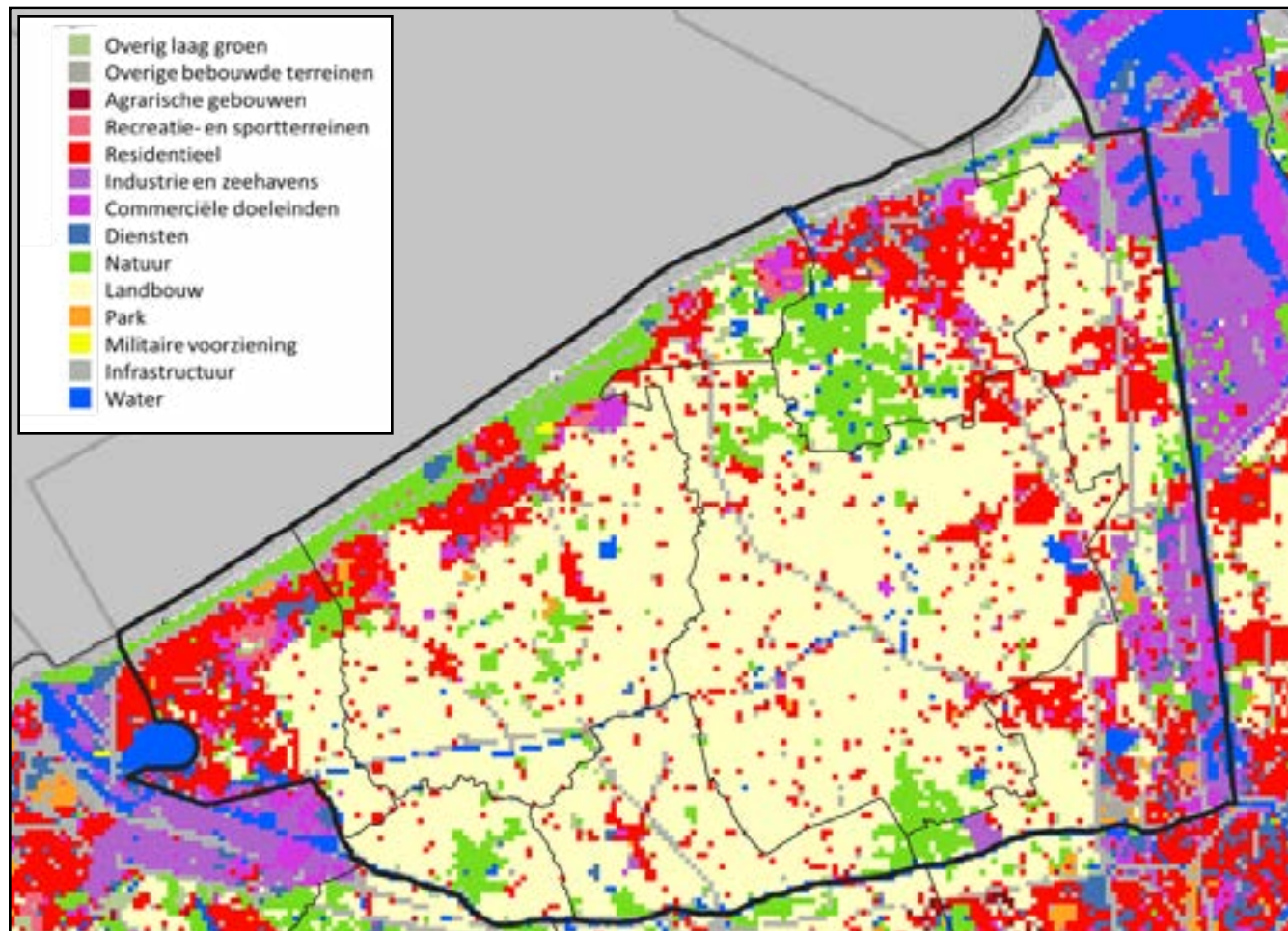
Land-use scenario applied here: **growth as usual**

In this scenario, we continue to occupy open space at the current rate. This means that every day about 6 ha of open space disappears. In this scenario therefore you can see a strong increase in the area of residential land.

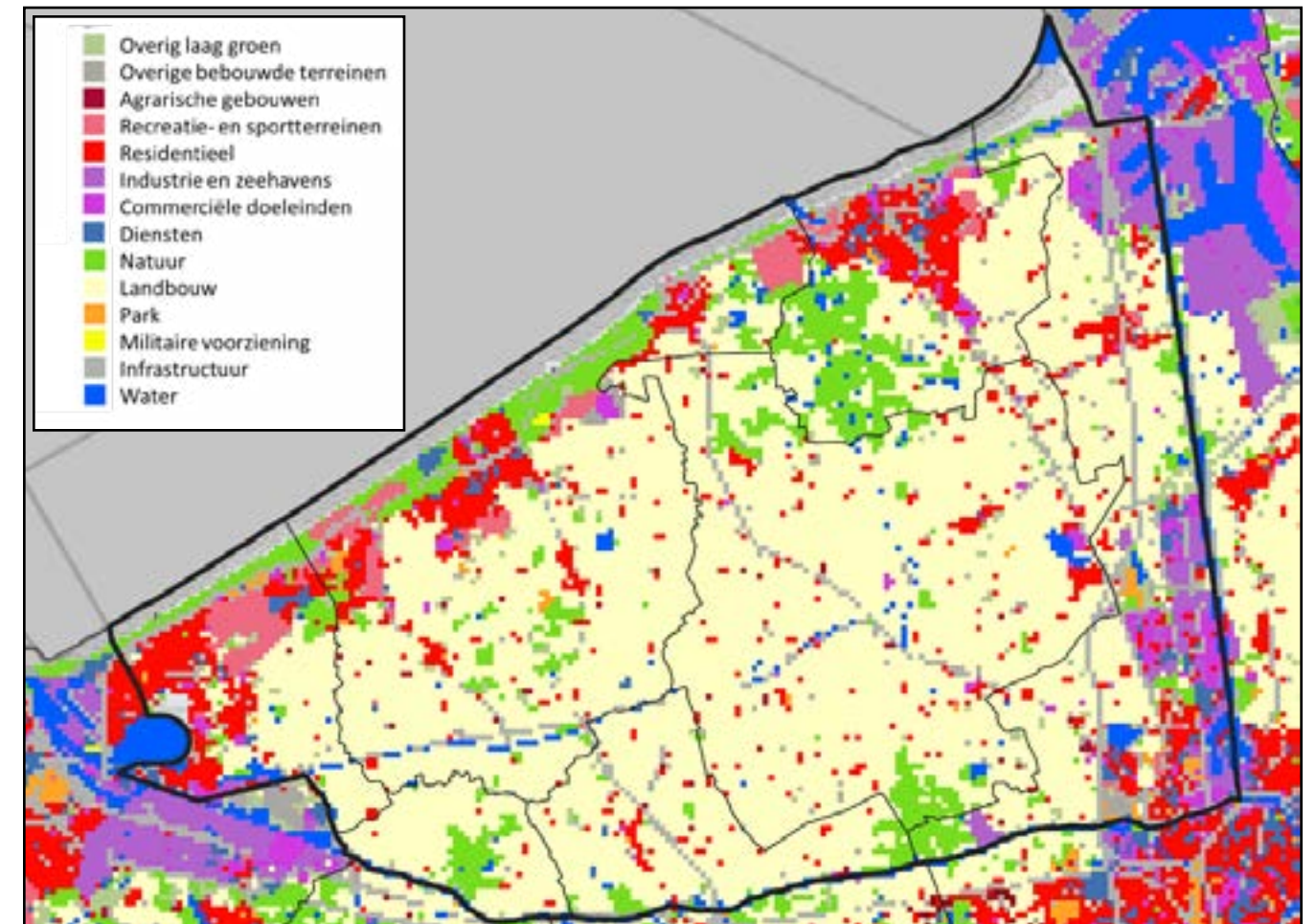
This scenario aligns with a **population growth** from 63,771 inhabitants in 2013 to 74,522 inhabitants in 2050. As a result, the population in the Oudlandpolder increases by **12%**. As a result of the possibility always to cut new open space, a relatively large part of this population growth will come from smaller municipalities such as Zuienkerke and Oudenburg.

Gemeenten	2013	2050	% groei
Blankenberge	19 018	20 399	+7,3
Brugge	118 211	124 974	+5,7
Jabbeke	13 648	17 593	+28,9
Zuienkerke	2 793	5 704	+104,2
Bredene	16 534	18 515	+12
Oostende	69 068	67 521	-2,2
Oudenburg	8 926	13 543	+51,7
De Haan	12 425	13 527	+8,9

Space usage in 2050 in the Oudlandpolder according to the Spatial Model Flanders under the land use scenario 'growth as usual'.



For comparison: Land use in the Oudlandpolder in 2013.

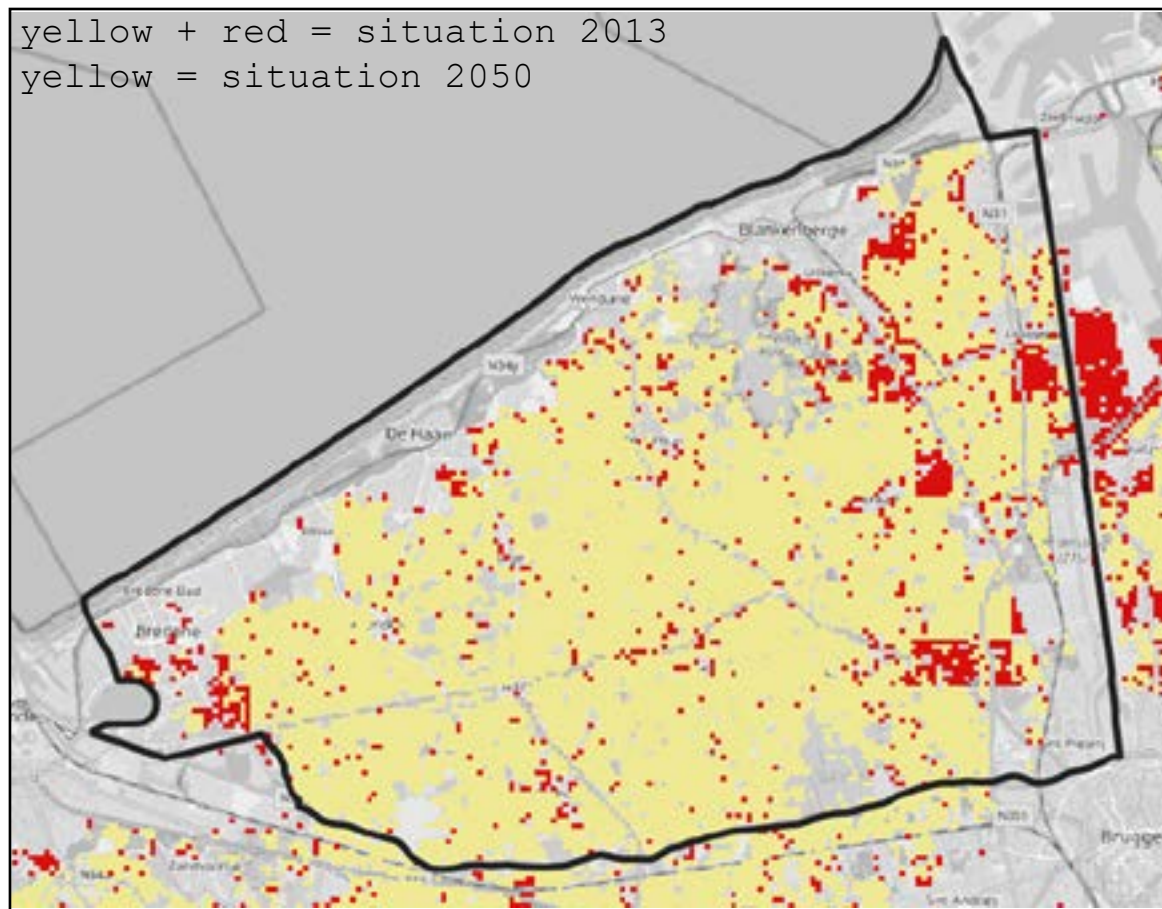


2. AGRICULTURE

Where does farming take place?

On the difference map below, all the agricultural area is colored. By agricultural area we mean here:

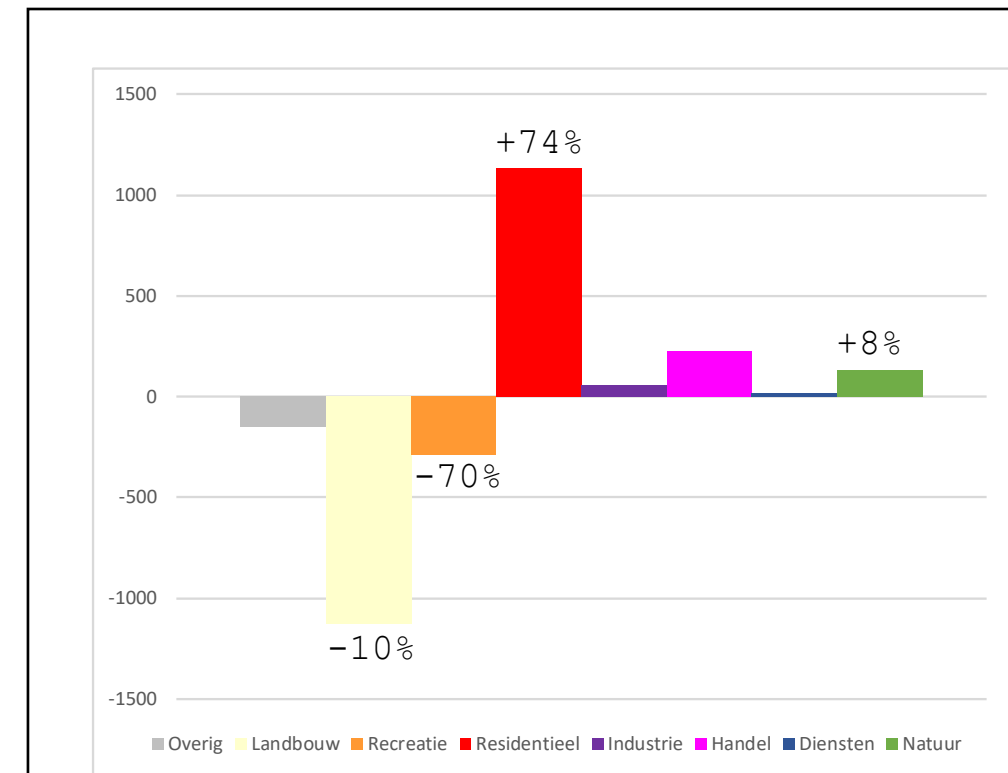
- **crop fields, production grasslands and orchards** declared to the government for income support [\(4\)](#).



- **non-registered agricultural land:** fields and biologically low-value grasslands that are not registered with the government for income support, management agreements or under environmental legislation (e.g. manure policy). In practice, these are plots for hobby farming, horse and sheep pastures and all kinds of rough grazing.

- **agricultural buildings**

This enumeration shows that e.g. grasslands in nature management, for which income support is applied for, are also presented here as agricultural areas.



Future farms

Agricultural holdings can be divided into 2 categories:

1. A **small number of very large farms owned by large agro-industrial players** from the feed and food industry, which have easy access to capital and raw materials. Their entire management is focused on a few products and is principally oriented towards yield and profit maximization. They produce for the international market at very small margins. The **farmers who have the operational responsibility** for these companies are **relieved of any concerns**: raw materials, planting and irrigation schedules, pesticides, etc: Everything is delivered ready-made.

2. **Small, mixed family farms** with a large share of animal production, operating according to a high-performance, cost-reducing model with high value-added creation. They focus on the production of **exclusive food products** that are bought by the higher income classes, both at home and abroad.

- **Digitalization continues.** In family farms, however, to a lesser extent than in large, industrial companies. This is mainly because (digital) innovations are less accessible to them (too expensive, lack of information, etc.).

- **Full electrification** (as in the other scenarios).

- **Broadening of activities is very rare.** Some farms have a shop or offer healthcare activities, but not many.

Future agricultural practices

- **Crops** are optimized and chosen **in line with (inter) national demand.**

- **Crop production** on very **large, contiguous plots** of farmland without natural buffer strips between, combined with **greenhouse cultivation.**

- **(Dairy) cattle** farms in **large-scale, industrial** sheds scattered across the landscape.

- **Big players go all out for high-tech, automated systems.** Farmers manage IoT infrastructure and databases (maintain databases and sensors, enter data,...), and are told what exactly to do, and when, based on Artificial Intelligence-based systems.

- **Smaller farms** focus mainly on (dairy) livestock farming on previously extensively grazed grasslands. They make exclusive products, such as **high-quality meat products and special cheeses.**





A quick comparison with the chapters about agriculture in the other scenarios? Click on one of the following links:

[sustainability](#)

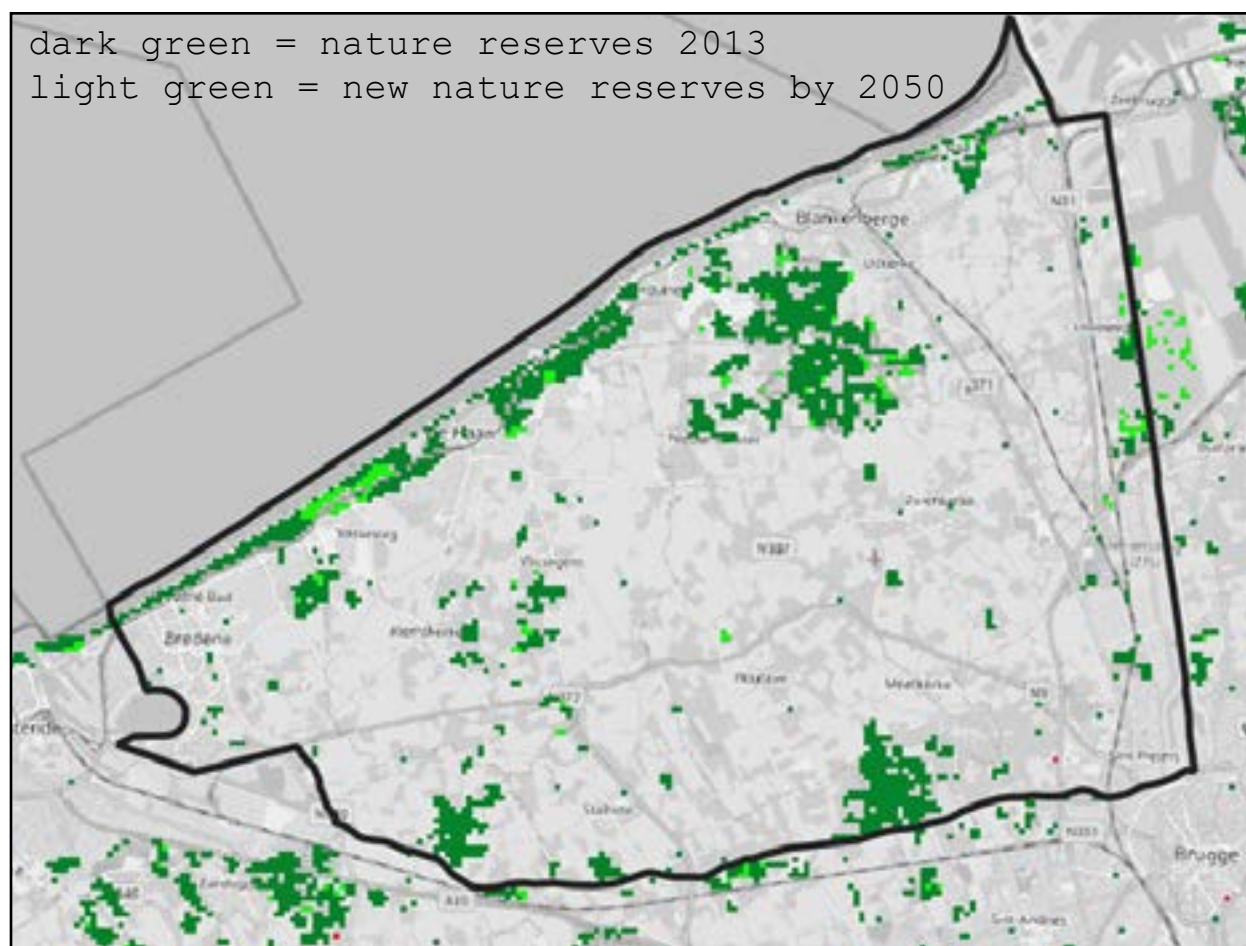
[not choosing is losing](#)

[technological optimism](#)

3. NATURE

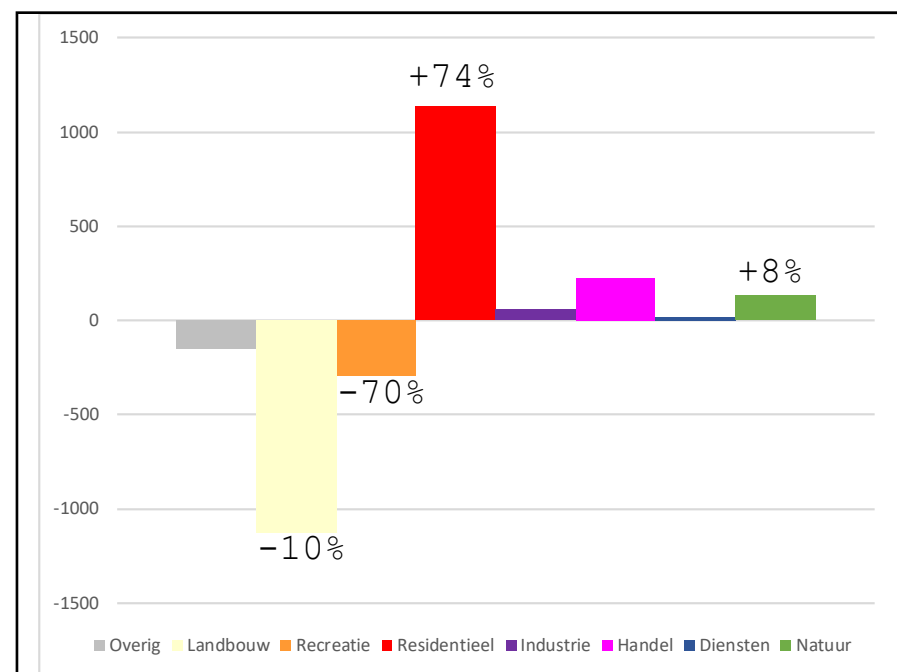
Where are the nature reserves located?

On the difference map below, forest, dunes, mudflats and salt marshes, natural grassland and marsh are categorized as nature.



The principle followed when creating additional nature in this scenario:

- **The already planned expansion of nature** in line with the conservation objectives **becomes reality**. This means that in 2050 17% of the wetland area from the 1950s will still be conserved.
- Outside the nature reserves, efforts to develop more natural elements are limited to fragments of pasture on the valley floors that are cultivated somewhat less intensively. This is designed to meet the water storage capacity of the polder. Compared to the current situation, in this scenario **both the quantity and the quality of natural elements outside the reserves will decline**.



Nature in the Oudlandpolder

- **Small expansion of natural areas.** In the coastal strip the changes are relatively greater than in the polder, because dune restoration has been carried out in certain places.
- **Contiguous areas with nature reserve status are relatively small** and scattered all over the landscape.
- **Outside the nature reserves, only a few fragmentary pieces of nature can be found.** This puts pressure on certain plant and animal species (e.g., invertebrates, amphibians, and other species that cannot cross large distances between nature reserves). The resilience of many populations is diminishing because of migration, and hence genetic exchange, and recovery of populations after calamities are no longer possible.
- In the absence of a nature and environmental policy tackling the stress factors from which ecosystems in the Oudlandpolder are suffering, such as a water policy geared to the local needs of (saline) ecosystems, **biodiversity in natural areas will decline significantly by 2050.**
- Natural areas are opened up for hikers and cyclists in a way similar to how it is done now.



Nature management with the help of volunteers

Nature management in the Oudlandpolder is **carried out almost exclusively by volunteers.** The Oudlandpolder receives little attention within the nature protection policy, which means that competent authorities and nature organizations have too little means to carry out nature management there in line with the set nature objectives. That is why they are trying to set up an extensive volunteer operation. However, this requires a strong commitment and a lot of (free) time. Furthermore, a small minority among the farmers remains committed to nature in the Oudlandpolder, which means that part of the historical permanent grasslands that fall outside the reserves can be saved.



A quick comparison with the nature chapters in the other scenarios? Click on one of the following links:

[sustainability](#)

[not choosing is losing](#)

[technological optimism](#)

4. TOURISM & RECREATION

Little attention for the touristic potential of the Oudlandpolder.

The combination of agro-industrial agriculture, characterised by monocultures and industrial-looking farms, and a further loss of open space due to urban sprawl and agricultural buildings strewn all over the landscape, are causing a drastic decline in both recreation and tourism. Partly due to increased social inequality, fewer and fewer people have the means to go on vacation. If there is money to go on holiday, many prefer (foreign) areas that have much more to offer than the Oudlandpolder.

A quick comparison with the tourism chapter in the other scenarios? Click on one of the following links:

[sustainability](#)

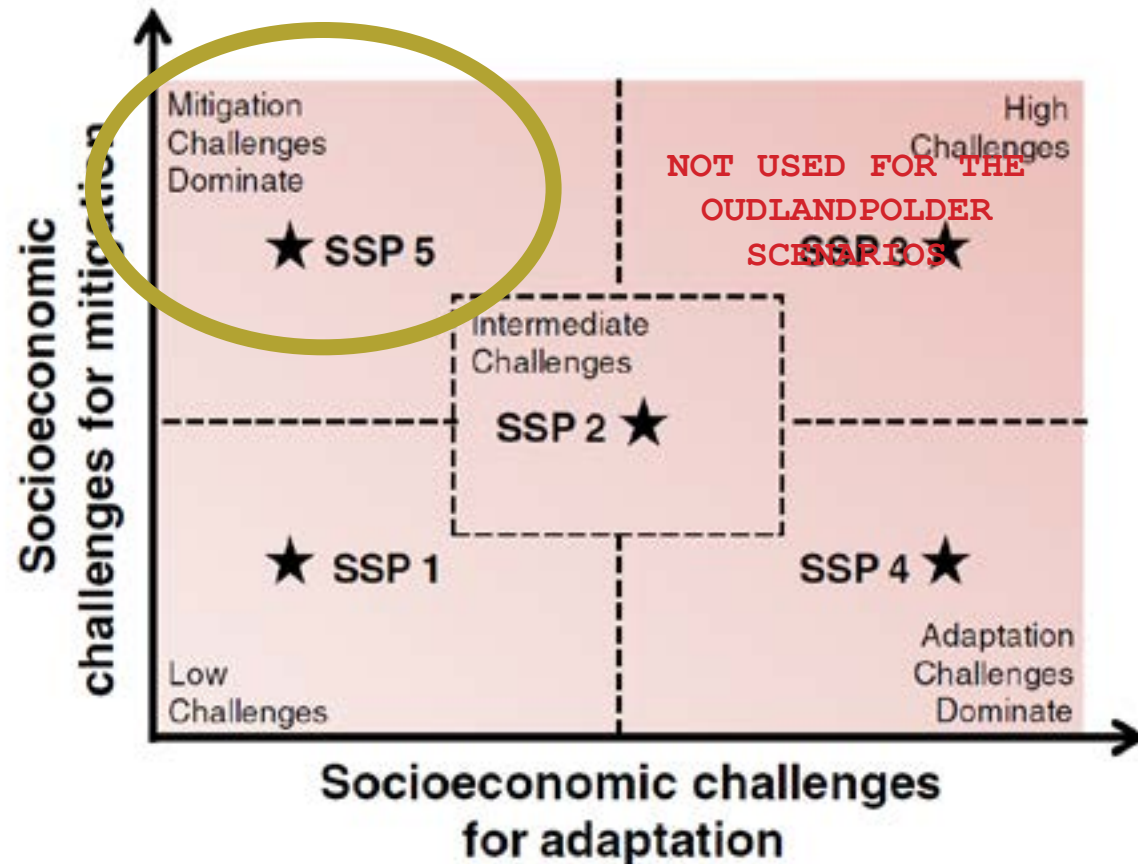
[not choosing is losing](#)

[technological optimism](#)





**SCENARIO 4:
TECHNOLOGICAL
OPTIMISM**



Bron: O'Neill, B.C. et al. (2014)

Introductory narrative

In this scenario, the **digital revolution** continues apace, creating a fundamental break with the past. Globally, more and more people are finding their way to online social debates. This leads - for the first time in history - to the creation of organizations that have the means and power to tackle global problems in a coordinated manner. This evolution goes hand in hand with the development of a worldview in which **market thinking** and **citizen participation** play a major role. In addition, this digital revolution is also causing precision and customization to become the norm, which creates opportunities to separate natural and anthropogenic systems to a great extent.

The **costs** associated with **mitigation** are **high** in this scenario. This is because global economies are still heavily dependent on fossil resources, and a profound environmental awareness is lacking. **Sustained economic growth**, on the other hand, together with far-reaching technological innovation and infrastructural adaptations, result in societies adapting relatively easily to changing climate conditions. Thus, **adaptation costs remain relatively low** in this scenario.



1. LAND USE

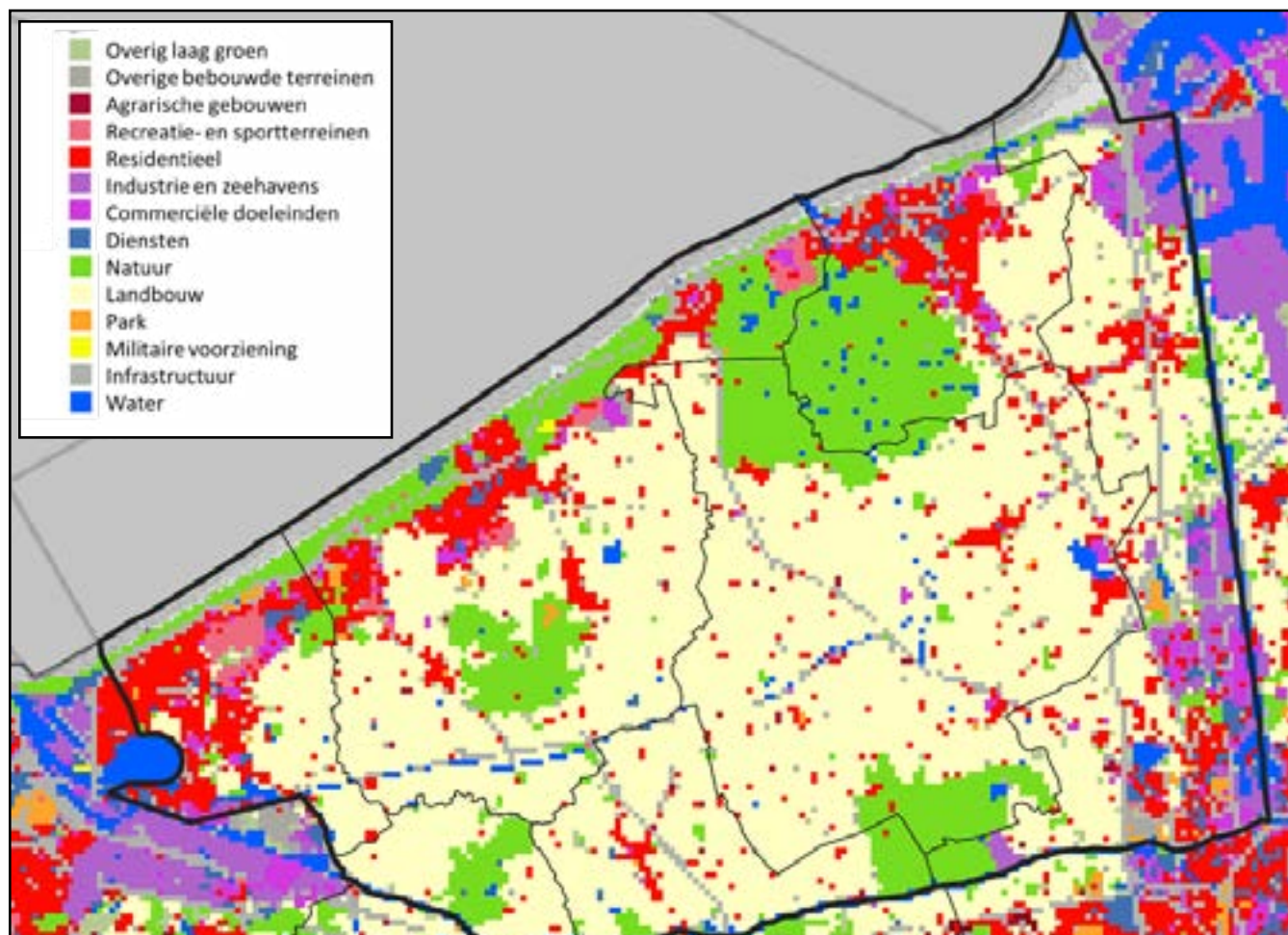
Land use scenario applied here: **Flanders Spatial Planning Policy**

This scenario assumes strong densification, based on the strategic vision Flanders (approved on July 13, 2018), with the goal of reducing the growth in land take to 0 ha per day by 2040. This leads to densification of cores and well-located locations, that is locations with a high node value and a high level of amenities.

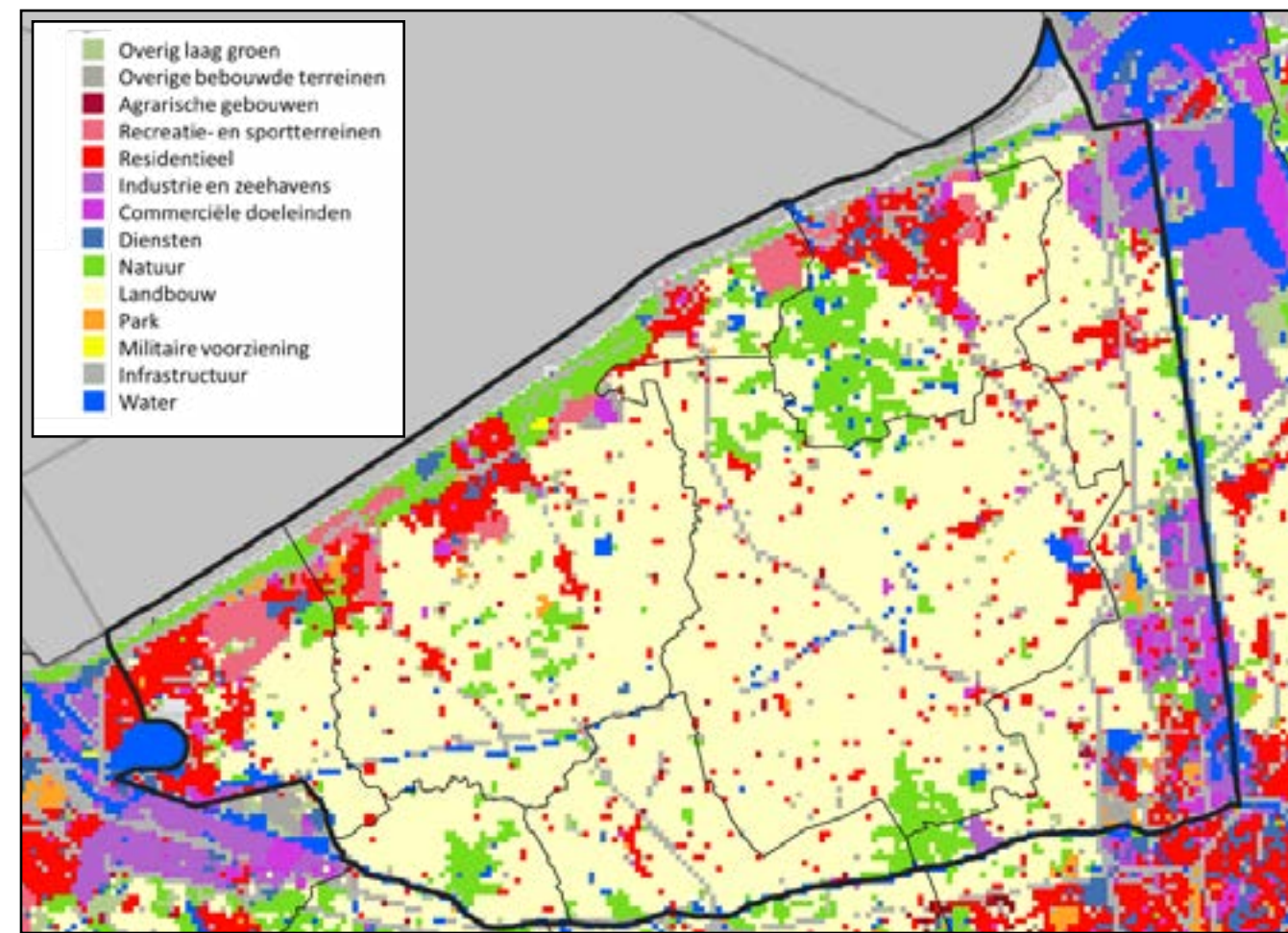
This scenario aligns with a **population growth of 33%**: from 63,771 inhabitants in 2013 to 88,419 inhabitants in 2050. This population growth is mainly located in the larger cities.

Gemeenten	2013	2050	% groei
Blankenberge	19 018	23 329	+22,7
Brugge	118 211	142 946	+20,9
Jabbeke	13 648	19 760	+44,8
Zuienkerke	2 793	4 480	+60,4
Bredene	16 534	20 256	+22,5
Oostende	69 068	80 932	+17,2
Oudenburg	8 926	16 718	+87,3
De Haan	12 425	17 581	+41,5

Space usage in 2050 in the Oudlandpolder according to the Spatial Model Flanders under the land use scenario 'policy plan space Flanders'.



For comparison: Space use in the Oudlandpolder in 2013.

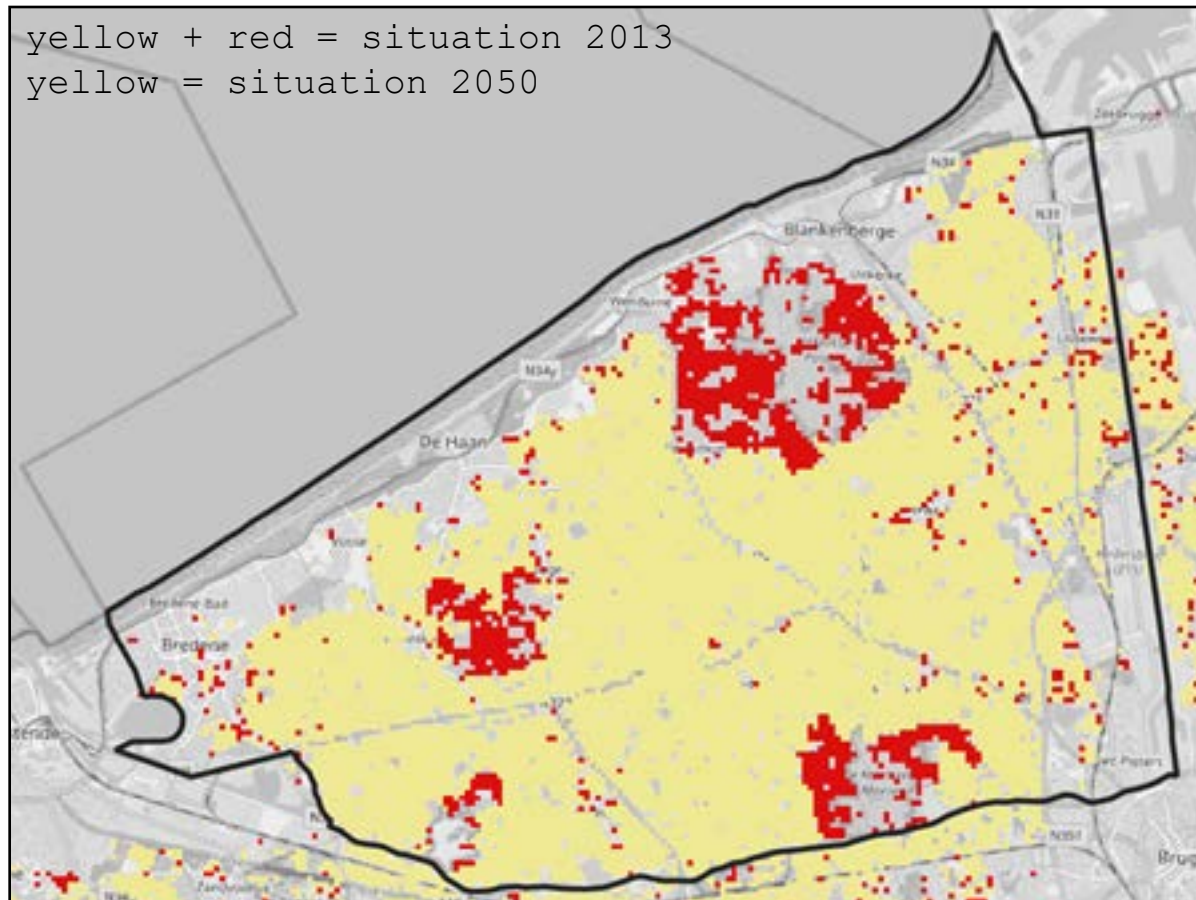


2. AGRICULTURE

Where does farming take place?

On the difference map below, all the agricultural area is colored. By agricultural area we mean here:

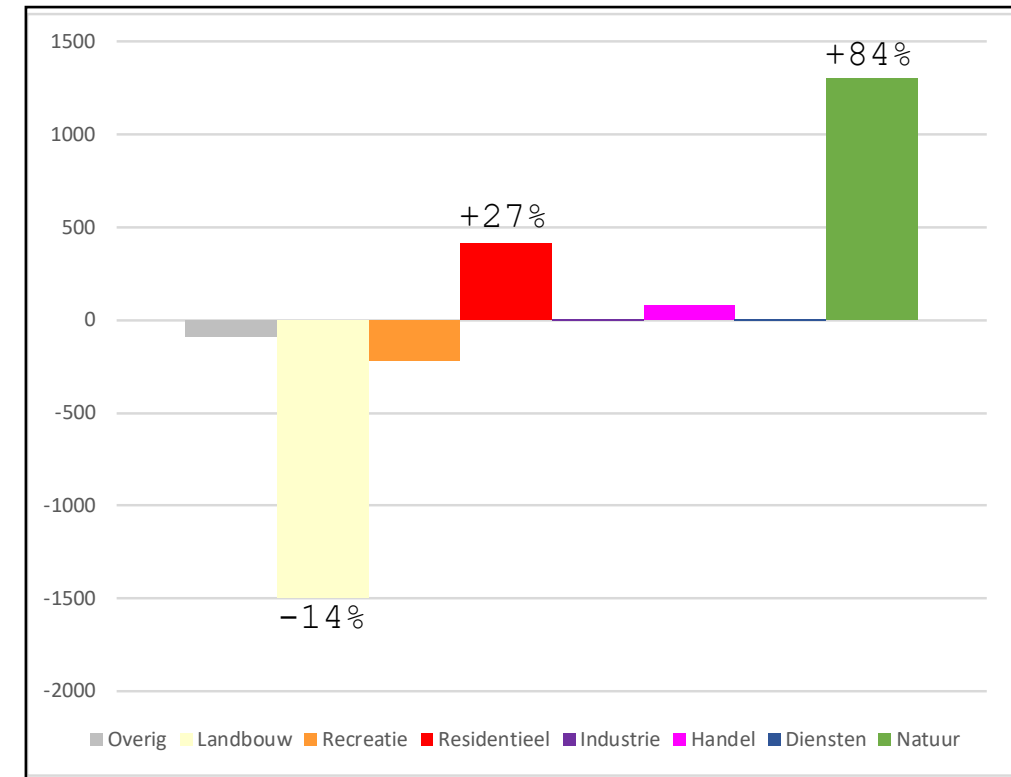
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- **non-registered agricultural land:** fields and biologically low-value grasslands that are not registered with the government for income support, management agreements or under environmental legislation (e.g. manure policy). In practice, these are plots for hobby farming, horse and sheep pastures and all kinds of rough grazing.

- **agricultural buildings**

This enumeration shows that e.g. grasslands in nature management, for which income support is applied for, are also presented here as agricultural areas.



Future farms

- **Specialized, large-scale and capital-intensive farms producing mainly for the foreign market.** Consumption - also of animal products - and economic growth remain at a high level internationally, which creates opportunities for the farmers in the Oudlandpolder. Their high-quality products can easily find a market.
- Even more than in the other scenarios, **digitalization and automation continue.** Farmers are supported in their daily practice by integrated sensor systems, models, robotics, tracking and tracing systems, etc. Together with the **high level of education of farmers**, this gives them a **very high degree of autonomy.**
- **Rapid adoption of agricultural innovations.** Farmers can not only rely on structures that provide them with financial oxygen (e.g. cooperatives), but also on programs that keep their knowledge and skills up to date.
- **Farmers are farmers:** Diversification in agricultural enterprises is marginal.
- **Fully electrified:** tractors and other implements are driven electrically, stables are heated by electricity, etc.
- The **typical polder farms have almost completely disappeared.** The old farms are sometimes preserved, though are surrounded by large sheds and greenhouses.

Future agricultural practices

- **Intensive crop farming** is alternated with non-soil farming consisting of **greenhouse cultivation** and large-scale sheds for **intensive pig and cattle farming.** These farms are **designed as closed systems**, eliminating emissions to the surrounding environment. The vast majority of the raw materials needed by these farms are imported from outside the Oudlandpolder.
- **Computer-controlled precision agriculture:** Farmers grow, in strips next to each other, different crops per plot. Thanks to the use of IoT systems, irrigation, pest control, fertilization, etc. can be done in a tailored way. As a result, only minimal amounts of polluting effluent end up in the surrounding canals and groundwater.
- The Oudlandpolder is characterized by a **patchwork of irrigation basins** from which water is distributed based on measurements by soil moisture sensors, groundwater level measurements, etc.





A quick comparison with the chapters about agriculture in the other scenarios? Click on one of the following links:

[sustainability](#)

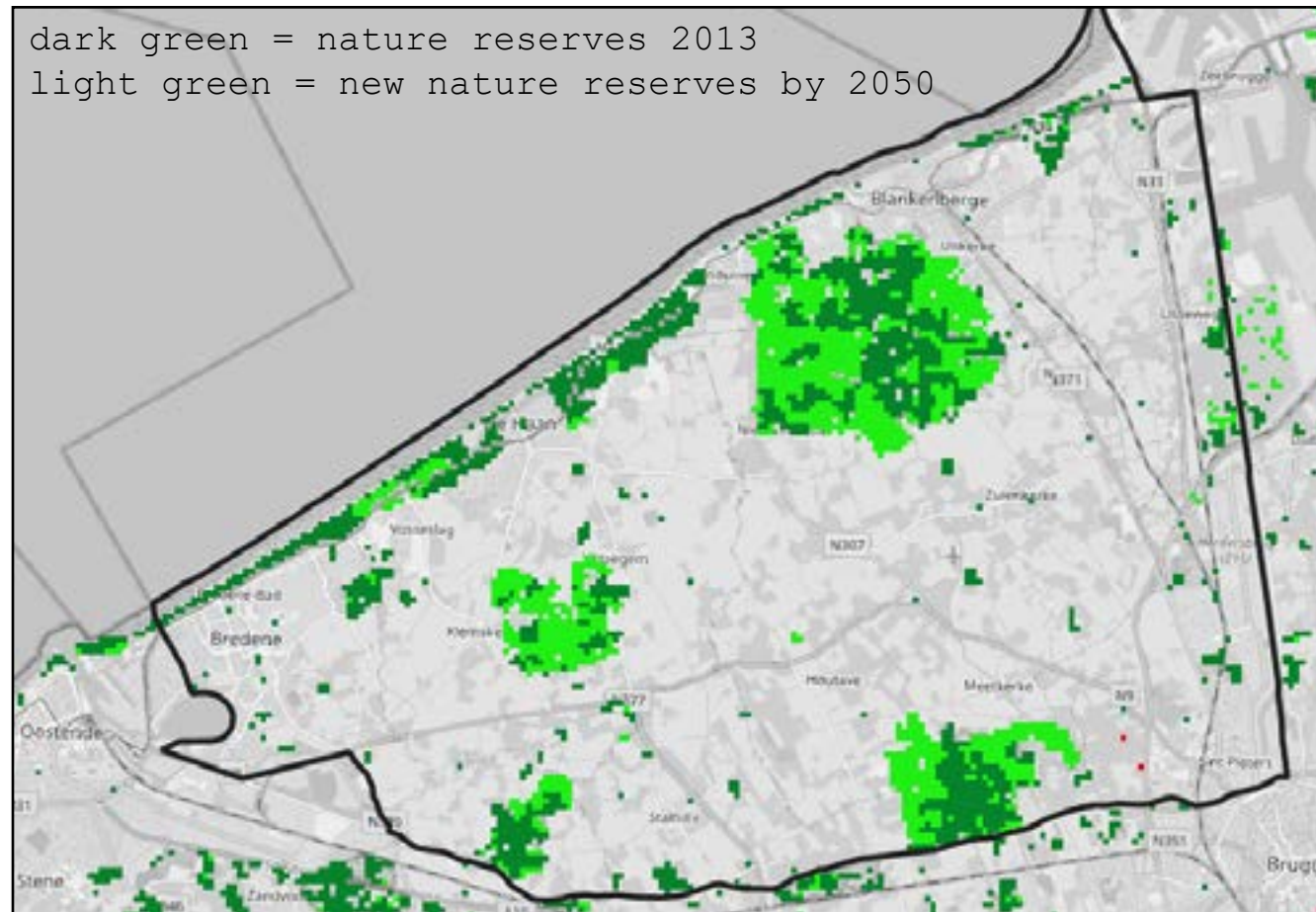
[not choosing is losing](#)

[structural inequality](#)

3. NATURE

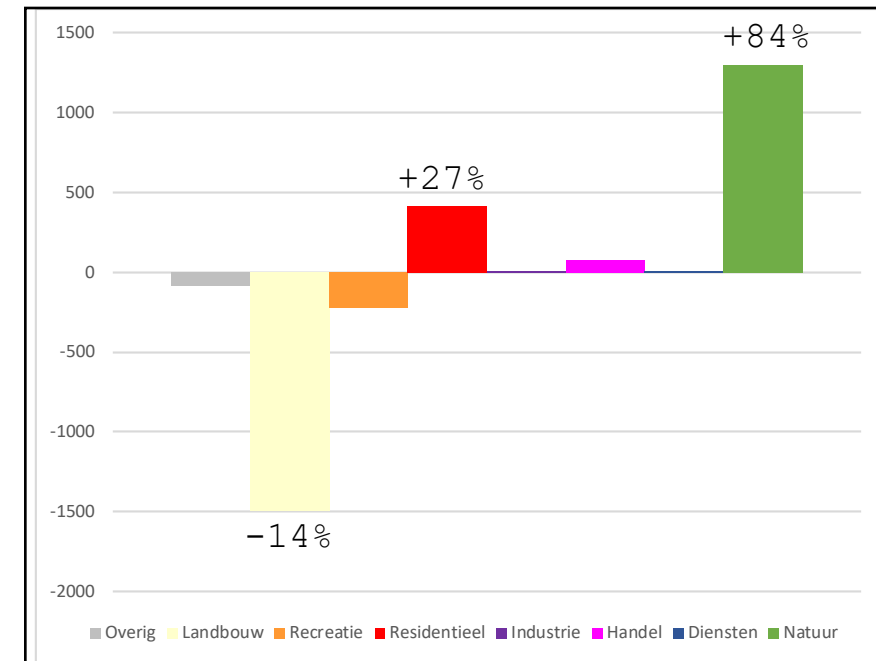
Where are the nature reserves located?

On the difference map below, forest, dunes, mudflats and salt marshes, natural grassland and marsh are categorized as nature.



The principle followed when creating additional nature in this scenario:

- The **nature reserves are concentrated in 4 islands**: Uitkerkse Polder, Meetkerkse Moeren, the polder grasslands between Klemskerke and Vlissegem and 't Pompje. This means that in 2050 34% of the wetland area from the 1950s will still be preserved.
- These 4 nature islands consist of **established nature reserves** and adjacent parcels that occur in the search zones identified as possible **compensation areas for the expansion of the port of Zeebrugge**.
- Historic grasslands that lie outside these 4 nature islands and are not yet nature reserves will be given up and become production grassland.



Nature reserves in the Oudlandpolder

- **Management as a function of (vulnerable) ecosystems** which they are trying to maintain in these areas. Investments are made in large, contiguous reed marshes, sedge vegetations and saline grasslands.

- In this scenario natural systems are protected as much as possible from human influences (= land sparing principle). All **recreation** is therefore **excluded from the nature reserves**.

- Because nature in the Oudlandpolder is pushed back to 4 'islands', some populations come under pressure (e.g. seepage plants and pioneers such as glasswort or sea aster, small invertebrates, amphibians, ...). These **populations become isolated** because migration from one nature area to another is no longer possible. This makes them particularly vulnerable to calamities such as outbreaks of disease, severe flooding, drought, etc. As a result, **biodiversity** in the Oudlandpolder **declines**, despite the relatively large area of nature reserves.



Professionalisation and digitalisation

- **Nature management carried out by professionals** from nature organizations and authorized government agencies.

- Nature management performed by **certified individuals** who have received the necessary training and education.

- Nature management based on **IoT systems** to monitor closely the situation in nature reserves and intervene where necessary (by technological means).



A quick comparison with the nature chapters in the other scenarios? Click on one of the following links:

[sustainability](#)

[not choosing is losing](#)

[structural inequality](#)

4. TOURISM & RECREATION

Hardly any facilities for recreation and tourism

Also in this scenario, the scenic quality of the Oudlandpolder has deteriorated significantly due to industrialization in the agricultural sector. Although urban sprawl is limited, the traditional open polder landscape with its grasslands and characteristic polder farms is largely lost.

The nature areas in the polder are closed off to any form of recreation. This is to keep out as many stress factors caused by human activities as possible. In this way we try to make maximum use of the space available for nature to maintain and restore ecosystems.

A quick comparison with the tourism chapter in the other scenarios? Click on one of the following links:

[sustainability](#)

[not choosing is losing](#)

[structural inequality](#)



REFERENCES

(1) O'Neill, B.C. et al. (2014) A new scenario framework for climate change research: the concept of shared socioeconomic pathways. Climatic Change 122/ 387-400.

(2) Allen, M.R. et al. (2018) Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.

(3) [IIASA dataset](#)

(4) [Geopunt dataset](#)

(5) Decler, K. et al. (2016) Mapping wetland loss and restoration potential in Flanders (Belgium): an ecosystem service perspective. Ecology and Society 21(4):46. (zie ook [deze link](#))

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