The Coastal Compass 2007

Indicators as guidelines for Integrated Coastal Zone Management

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The Coastal Compass

→ SUSTAINABLE MANAGEMENT OF THE COAST

Sustainable management of the coast is the **final objective**. This management should take into account tourist and other economic interests, in which social matters and a pleasant home and living environment are being addressed, and in which the unique nature and cultural heritage are being respected. This is about a coast that keeps attracting present and future generations.

In 2007, the coast was the living environment for about 36 percent of the population of West Flanders. Working on **healthy, safe and high-quality working, housing and living conditions** contributes to the further sustainable development of the coast: that is the way to arrive at a colourful mix of inhabitants, in which young families as well as elderly people have their own place. **In that way the social tissue becomes stronger and the area can retain its cultural identity.** Added to this is the fact that the local population can benefit from the further protection of the cultural heritage, which also supports tourism.

The development of high-quality tourism also presupposes a vital tourist sector as well as sustainable tourist facilities. **All economic and tourist developments cannot exceed the bearing power of the coastal zone, though.** These sectors must develop in a sustainable way, with respect for the material, ecological, human and social capital, by investing in it instead of consuming it.

The nature reserves, dunes, mud flats or 'slikken' and salt marshes or 'schorren' and the many other green places all form part of **the coast's ecological capital**. The sustainable development of the coast comprises the protection of these green zones, next to the protection of air, earth and water against different forms of pollution. There is only question of integrated management if the 'environmental aspect' is integrated within the other sectors. This integration can act as an impetus for the further sustainable development of the coast at the social, cultural and economic level. On the other hand, the social, cultural and economic development cannot happen at the expense of the environment. Only if the effects of human activities upon the ecosystem do not hazard the operations and structure of it, can the sustainable development of the coastal zone become a success.

Achieving this ideal objective will require substantial time. For its realization **consultation and collaboration are needed between the different parties involved, between the sectors and the involved levels of government**, in order to jointly arrive at solutions that are acceptable for everyone. **Win-win situations** in different disciplines will most certainly help develop a sustainable coast.

→ HOW TO MEASURE SUSTAINABLE COASTAL MANAGEMENT?

In order to make a complex matter like coastal management more transparent and user-friendly, a sustainability barometer is used. This barometer consists of a set of indicators or data allowing the description of complex phenomena in a simple way. Regular evaluation of the indicators will tell if the coast evolves towards sustainability or if it just about misses it.

The Coordination Centre for Integrated Coastal Zone Management has developed a sustainability barometer for the coast. This barometer allows following the developments at the coast. The collected data can offer support when taking decisions with possible repercussions for the coast. The sustainability barometer also makes it easier to communicate with the general public about concrete, observable trends.

Developing a sustainability barometer for the Belgian coast was started in 2000. In the first study a vision was formed with six priorities for the coast. The study also took the first step for the listing of indicators to measure sustainable development at the coast[1]. In 2001, the Coordination Centre for Integrated Coastal Zone Management sought the participation of some seventy coastal actors with different angles of vision, through workshops[2]. Eventually, the coastal actors selected a number of specific **indicators** for the monitoring of sustainable development at the coast.

The indicators of the Coastal Barometer are communicated in three different manners: through the web site, the technical chart and the Coastal Compass.

The dynamic web site www.kustbeheer.be/indicatoren allows free access for everybody to the data and background information, the technical charts, etc. Newly available data will be put upon the web site as quickly as possible.

The technical chart is available through the web site. It contains detailed information per indicator and is intended for those who are interested and wish to know more about any particular measurement.

The Coastal Compass discusses the 21 indicators and attempts at framing them into a wider vision. In the Coastal Compass the information from the barometer is made available, but in a different way. This second edition of the Coastal Compass gives the trends of the past year at a single glance. The first edition was launched in March 2006.

The Coastal Compass thus keeps a close watch on and tries to identify the trends at the coast, in order to be able to stimulate the wanted policy. It is not a value judgement of the coast or of coastal policy, but a means to inform in an objective manner policymakers, experts as well as generally interested parties.

(1) Paredis, E., Block, T. & J. Van Assche. (2001). Op weg naar duurzaamheidsindicators voor het kustgebied, Universiteit Gent, Centrum voor Duurzame Ontwikkeling, in opdracht van het Ministerie van de Vlaamse Gemeenschap, Departement Leefmilieu en Infrastructuur, AWZ-AWK

(2) Anon. (2003). Voorstel voor een duurzaamheidsbarometer voor de kust. Environmental Consultancy and Assistance (ECOLAS):Antwerpen, Belgium. xi, 45 + annexes pp 5

→ READING GUIDE

For the sustainable development of the coastal area six equal priorities have been put forward. Each of the six chapters of the Coastal Compass will discuss one of these priorities. Each chapter consists of an introduction and a discussion of the indicators corresponding to the priority. The introductory text discusses the cross-indicator priority. Consecutively, the themes are discussed from a more strategic perspective and other policy fields are integrated. The text wants to warm up the discussion at the proper level.

The introductory text is built around three questions:
- **Where do we want to go to?** This section describes the ideal coastal situation, which is the vision of sustainable coastal management.
- **Where do we stand today?** This section discusses the current situation at the coast.
- **What can we do?** Under this final question items of action are listed on priority, not only for local actors, but also for all those involved at the coast.

The six priorities together form a framework upon which the indicators for sustainable development can be engrafted. Each of the 21 indicators can be grouped under one or more priorities. An overview of the priorities and indicators can be found in the reading guide.

The indicators are likewise discussed by following a number of questions:
- **Key message?** What are the principal conclusions of the indicator?
- **Why this indicator?** The general framework for the indicator and why this indicator is important for sustainable coastal management.
- **What does the indicator say?** Definition of the indicator and how the data have come about.
- **What are the results?** Which evolution can be observed and what is its explanation?
- **What about the future?** Generic recommendations for the future.

For each indicator a trend is given:
+: favourable
+/-: neutral
-: unfavourable

Upon evaluation a number of indicators have been changed or replaced as compared to the previous edition of the Coastal Compass. The objective of the indicator is retained, but its definition has been adjusted or fine-tuned to other indicators. In the reading guide these indicators are asterisked.

To this second edition of the Coastal Compass a chapter entitled 'Coastal Defence and Climate Change' has been added. The intention is to closely follow this current topic. The extra chapter is built in the same way as the six previous ones, which are each covering one priority, with an introduction and the discussion of a number of relevant indicators.

	THE 6 PRIORITIES						Extra chapter
	SUPPORTING TOURISM AND RECREATION	PRESERVATION AND REINFORCEMENT OF THE SOCIAL AND CULTUREL CAPITAL	IMPROVEMENT OF THE ENVIRONMENT AND NATURE	IMPROVEMENT IN THE QUALITY OF THE LIVING AND HOUSING CONDITIONS	REINFORCEMENT OF THE ECONOMIC TISSUE	CARRY OUT MANAGERIAL RENEWALS	COASTAL DEFENCE AND CLIMATE CHANGE
ACCESSIBILITY*	P. 17						
OIL POLLUTION AT SEA			P. 32				
PROTECTION ARCHITECTURAL HERITAGE*		P. 24					
ECONOMIC VALUE OF PORTS*					P. 48		
PROSPERITY INDEX*		P. 25			P. 25		
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PROTECTED AREA			P. 33	P. 33			
COAST-OWN HABITAT AND COAST-SPECIFIC SPECIES*			P. 43	P. 43			
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SEA LEVEL RISE							P. 65
NUMBER OF DAYS WITH WINDVELOCITY ABOVE 7 BEAUFORT							P. 68
SAND SUPPLETION QUANTITY							P. 69

*Indicator has been modified compared to the Coastal Compass of 2005.

→ DEFINITIONS

Sustainable development

According to the Brundtland report of 1987 sustainable development is 'a development directed at the satisfaction of the needs of the present without hazarding those of the coming generations, and of which the realisation requires a process of change, in which the use of auxiliary sources, the destination of investments, the direction towards technological development and institutional changes are fine-tuned to future as well as present-day needs.'

Integrated management of coastal areas

The management of coastal areas is defined by the European Commission as a 'continuous process with the general objective of realising sustainable development in the coastal zone by means of optimum management of human activities in this zone, with a view to improving the situation of the coastal environment and to maintain its diversity.'

An Indicator

An indicator is a data measure (fact / figure / value ...) describing an important phenomenon and allowing the representation of the state of affairs in an application area. Those who wish to investigate whether the coastal area is evolving into a sustainable direction can compile a set of indicators to evaluate at a regular basis and to chart the evolution towards (or the way towards) sustainability. The sustainability barometer is the sum of the indicators.

The coast

The coast comprises ten municipalities bordering the sea. These ten coastal municipalities are: Knokke-Heist, (Zee)brugge, Blankenberge, De Haan, Bredene, Oostende, Middelkerke, Nieuwpoort, Koksijde and De Panne.

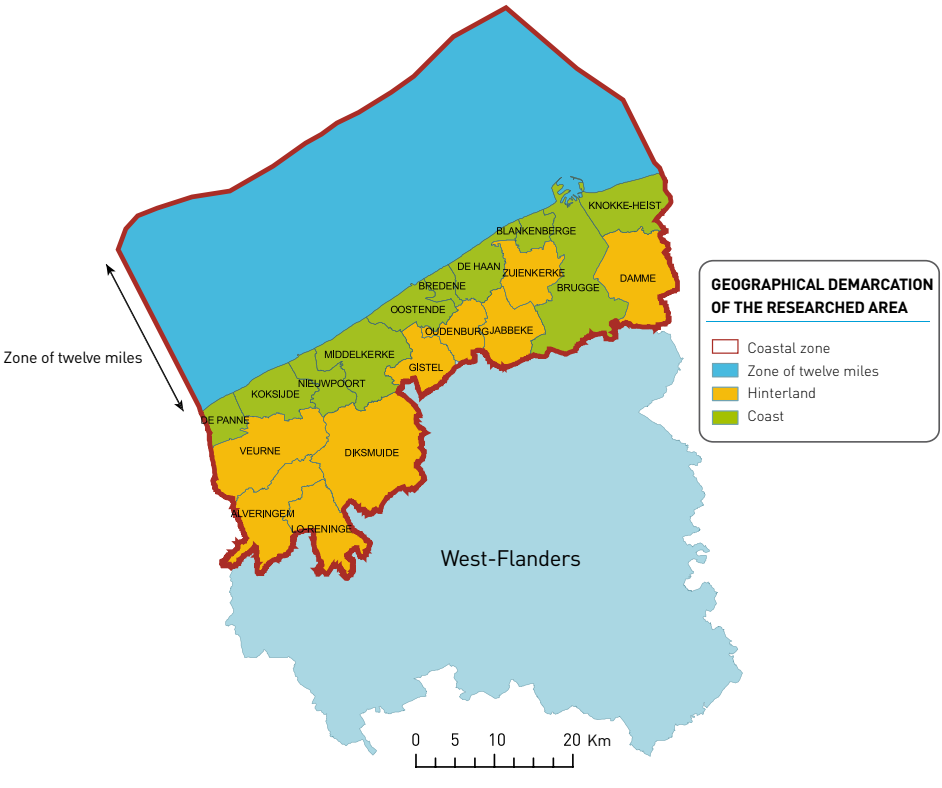
The Hinterland

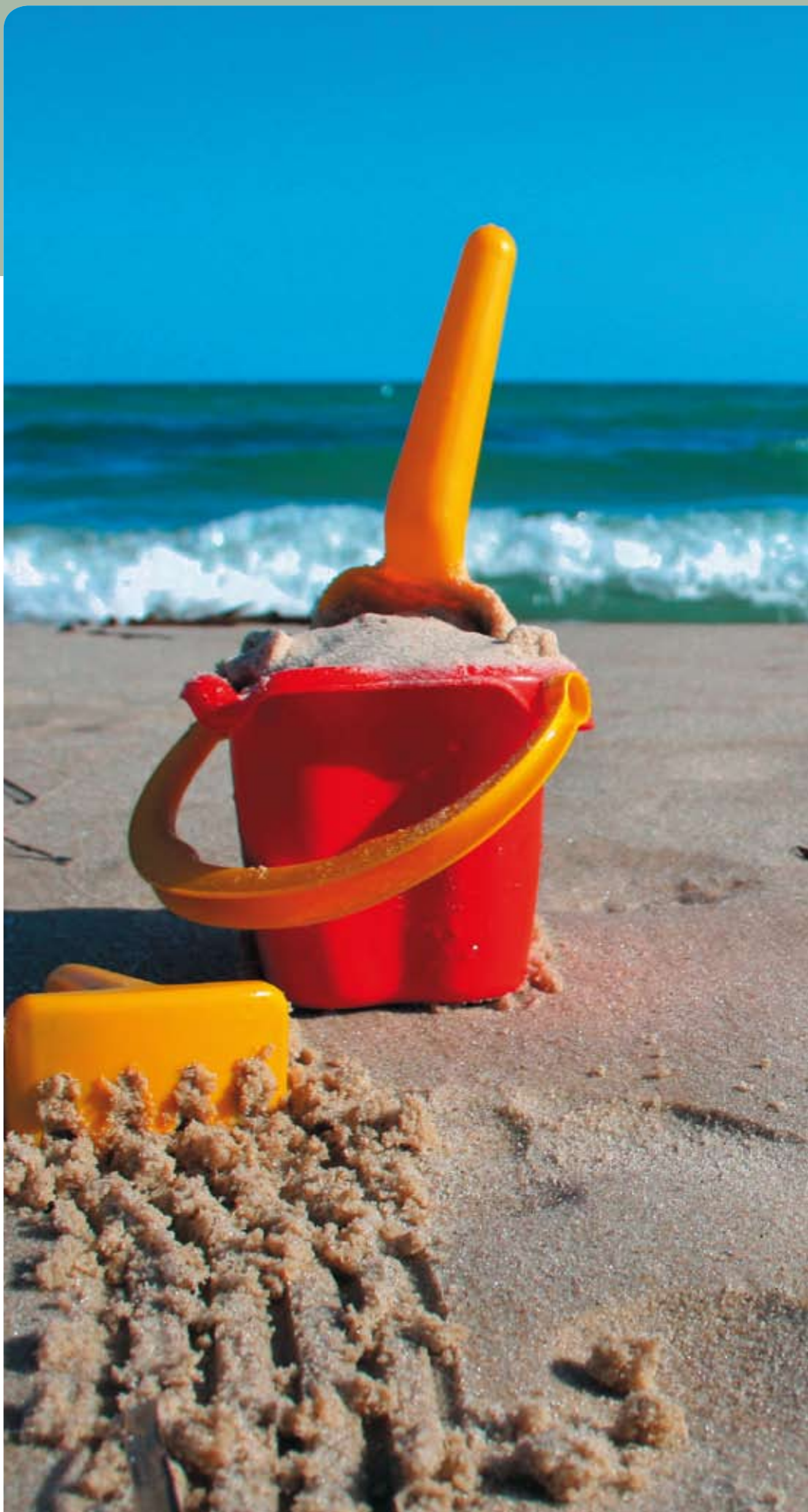
The nine municipalities, which are for the greater part situated in the polders, are Damme, Zuienkerke, Jabbeke, Oudenburg, Gistel, Diksmuide, Veurne, Alveringem and Lo-Reninge. Together they constitute the hinterland.

The coastal zone

The coastal zone comprises the ten coastal municipalities, the nine hinterland municipalities and the twelve miles' zone as borderline of the area with the sea.

Map Geographical demarcation of the researched area





1. SUPPORTING TOURISM AND RECREATION

- → DAY TOURISM BY PUBLIC TRANSPORT
- → ACCESSIBILITY
- → SIZE OF RESIDENTIAL TOURISM
- → EMPLOYMENT IN TOURISM*

* This indicator is discussed in a different chapter.

SUPPORTING TOURISM AND RECREATION

1

→ WHERE DO WE WANT TO GO TO?

For the sustainable development of the coastal area the support of tourism and recreation is a major objective. Tourism is considered to be a socio-economic lever for the region. In the further development of the tourist sector striving for sustainable and qualitative employment is necessary, as is the continuous activation of tourism through market diversification.

→ WHERE DO WE STAND TODAY?

Tourism in the coastal region is very diverse. The tourist can choose from a mix of residential formulas, all weather facilities and recreational options in the coastal provinces and the polder villages. **Being a substantial economic activity, the tourist sector has an influence upon employment, the use of public space, mobility and the quality of life at the coast.**

The coast is ever more evolving as a destination for second residence tourism. The demand for second residences has a strong influence upon the real estate market. The high prices are strongly pressurising commercial accommodation forms such as hotels and camping sites. The space of hotels is indeed ever more often taken in by apartment buildings, and camping sites are threatened in their existence by second residence parks. As a consequence of all of this, the possibilities to stay at the coast for a short period are becoming more and more limited.

The large number of second residences has an influence upon the economic growth of the coast. Indeed, second residences have a lower yearly occupation, in contrast to other accommodation forms, like hotels. Yet, the economic value of second residence tourism cannot be underestimated.

The shift from hotel exploitation towards second residence zones also has an influence upon employment. Within the tourist sector most jobs are situated in the catering business, of which the hotels take a substantial share. This type of employment is largely characterised by seasonal work and shifting hours and co-workers are expected to be highly flexible. That is why it is often hard for employers to fill vacancies. During the last years an evolution towards a better spread tourist season can be seen, though. This will create full-time jobs throughout the year as a result.

An extra impediment for the further tourist development is the accessibility of the coast. The last five kilometres into the direction of the sea are often the most difficult ones. Yet, the attractiveness of the coast as a tourist destination is determined to a great extent by the easy access of it. Public transport (train, tram, bus) forms a sustainable alternative in this respect, and over the past years, day tourists have also more and more often been making use of that. This rising trend has also been influenced by a number of positive policy measures.

The coast is popular among a wide range of tourists. **People with a handicap and the elderly form important tourist target groups.** Various organisations and authorities are therefore elaborating projects to increase the accessibility of the coast for less mobile people. The deployment of assistants or renting of adjusted beach wheelchairs are examples of this. In April 2007 the Province approved an urban planning ordinance regarding accessibility. People filing a building application will have to keep to accessibility criteria in the future.

→ WHAT CAN WE DO?

Both the coastal municipalities as well as the higher authorities are playing an important role in the maintaining of hotels at the coast. In order to prevent the extinction of the hotel function, special hotel zones must be indicated. A number of local authorities have already taken initiatives in this matter. By reserving space to this end, the growing pressure upon the hotel sector can be mitigated. In addition to this, investments must be made regarding the quality of the hotels at the coast. In the camping sector similar initiatives are going on in order to protect the camping function. These initiatives prevent the camping zones to be taken in by second residence parks and offer possibilities for the development of present-day quality camping sites.

Improving traffic mobility deserves special attention. Bottlenecks on the motorways cannot be avoided, but the relocation towards the coastal municipalities can happen in a much smoother way. The further development of large car parks at the edge of the towns can help processing the busy car traffic in the bathing resorts. In combination with a shuttle service or park and ride services these parking places can decrease traffic nuisance. Better facilities and extra promotional efforts will make tourists ever more often opt for public transport.

The catering business at the coast offers numerous chances to underprivileged people in the labour market, such as lower educated people, people lacking work experience and long-term unemployed people. They constitute a typical labour segment at the coast. The region can host and integrate this target group even better if the latter are given the proper training and monitoring in an orientation towards the tourist sector. The government must set up a framework to this end and elaborate a flanking policy, in order to respond better to the larger demand for flexible labour force in the catering business. This demand characterises the high season at the coast. In this respect, sector as well as policymakers should be open to quality employment offers.

In order to keep the coast attractive for less mobile people (such as elderly people or handicapped people), work must be done in the field of accessibility, from a global cross-policy field approach. Next to residential accommodation, the public domain, transport and sports and play accommodation deserve special attention here. The new provincial urban planning ordinance regarding accessibility is already an important step into the right direction. **Increased policy attention towards accessibility will in term translate into better accessible infrastructure.**

DAY TOURISM BY PUBLIC TRANSPORT

TREND

Author *Moira Callens (Westtoer)*
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→ WHY THIS INDICATOR?

Next to residential tourism, day tourism is a very important activity at the coast. As soon as a positive weather forecast has been broadcast, large numbers of day tourists are heading for the seaside, towards the sun and the beach. As day tourists travel to and from the coast in one and the same day, they can be the cause of substantial traffic nuisance.

→ WHAT DOES THIS INDICATOR SAY?

The indicator expresses the share taken up by public transport within the total of day tourism traffic to and from the coast. This indicator is calculated following a system that permanently measures the day-tourist traffic flows to and from the coast by car and by public transport. This measuring system, elaborated by Westtoer and Groep Planning, is based upon the data of the counting posts on the road and the number of train tickets sold. Residential traffic, day trips begun after 16.00 hrs and excursions with a 100 % routine character are not counted in. The system was tested against the results of a large-scale investigation of mobility behaviour at the coast.

→ WHAT ARE THE RESULTS?

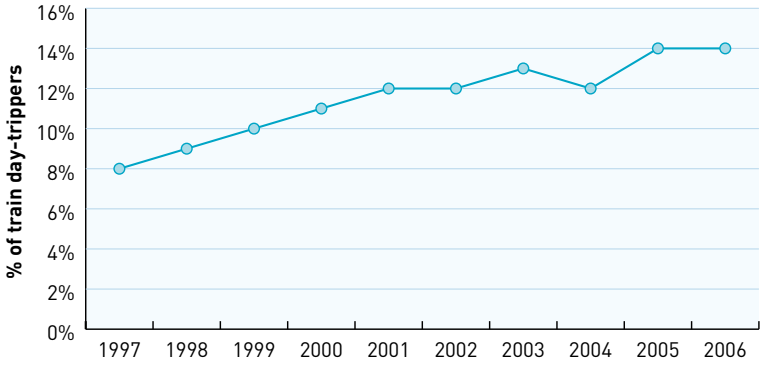
Between 1997 and 2006 the share of train traffic within total day-tourism traffic to and from the coast increased by 5.4 %. In 2004 there was a decrease of 1.6 % compared to 2003. This is probably related to the rescinding of a number of advantageous tariff formulas by the NMBS (= BNRC, the Belgian National Railroad Company) in the year 2004. By reintroducing a number of promotional tariffs this indicator has increased again in 2006. The share of train travellers within the total number of day tourists is growing. The policy of the NMBS can therefore have a positive influence upon this indicator.

→ WHAT ABOUT THE FUTURE?

Within the framework of integrated coastal management an increase of this indicator is aimed at. Indeed, the more day tourists are coming to the coast by train, the higher traffic safety will be, the more feasible things will become, and the lower parking pressure and air pollution will turn out to be.

Sun, sea and sand are yearly drawing thousands of people to the coast for a day. Using public transport can avoid traffic nuisance, which is the consequence of this kind of tourist flow. In 2006, 5.4 percent more day-tourists took the train to get to the coast when compared to 1997, and 2.2 percent more than in 2004. Compared to 2005 the share has remained more or less unchanged. Extra promotions by the NMBS have probably contributed to the rising trend. In 2006 the special seniors' tariff for a train ride to the coast was added to this. Advantageous train tariffs have a positive influence upon the number of day-tourists taking the train to the coast.

Graph **Share of day tourism by train in total day tourism to the coast, 1997-2006**



Source Westtoer

RESIDENTIAL TOURISM

TREND +/-

Author *Magda Monballyu*
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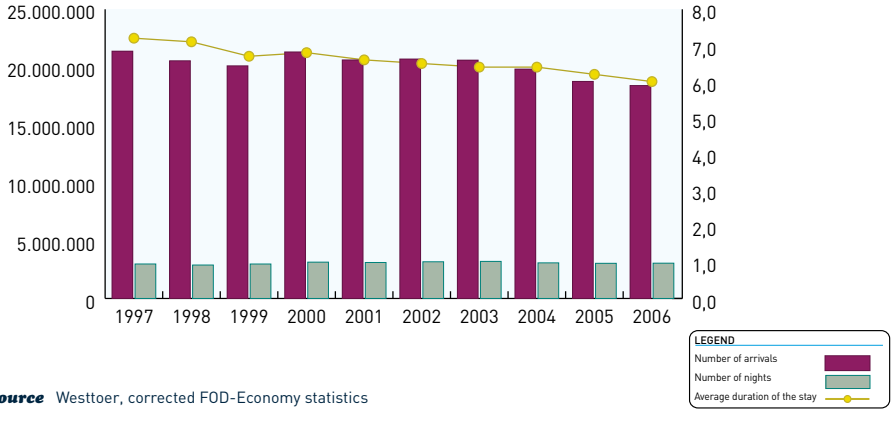
(Research Centre of Tourism and Recreation)

Annual a lot of foreign and local tourists visit the coast, often combined with an overnight stay. In 2006, there were 2% more arrivals then in 1997. This in spite of the shift from renting a holiday house to the use of a second residence. Because the average duration of the stay decreases, this trends leads to an important reduce in number of nights with 14% between 1997-2006. The increasing arrivals and the decreasing number of nights spend show that the coast is more suitable for short holiday periods than for longer periods. This will also have an important consequence in marketing and product developments.

Graph **Evolution of the arrivals, nights and average duration of the stay in commercial accommodations at the coast, 1997-2006**



Source Westtoer, corrected FOD-Economy statistics

ACCESSIBILITY

TREND

Author *Greet Vandenrijt*
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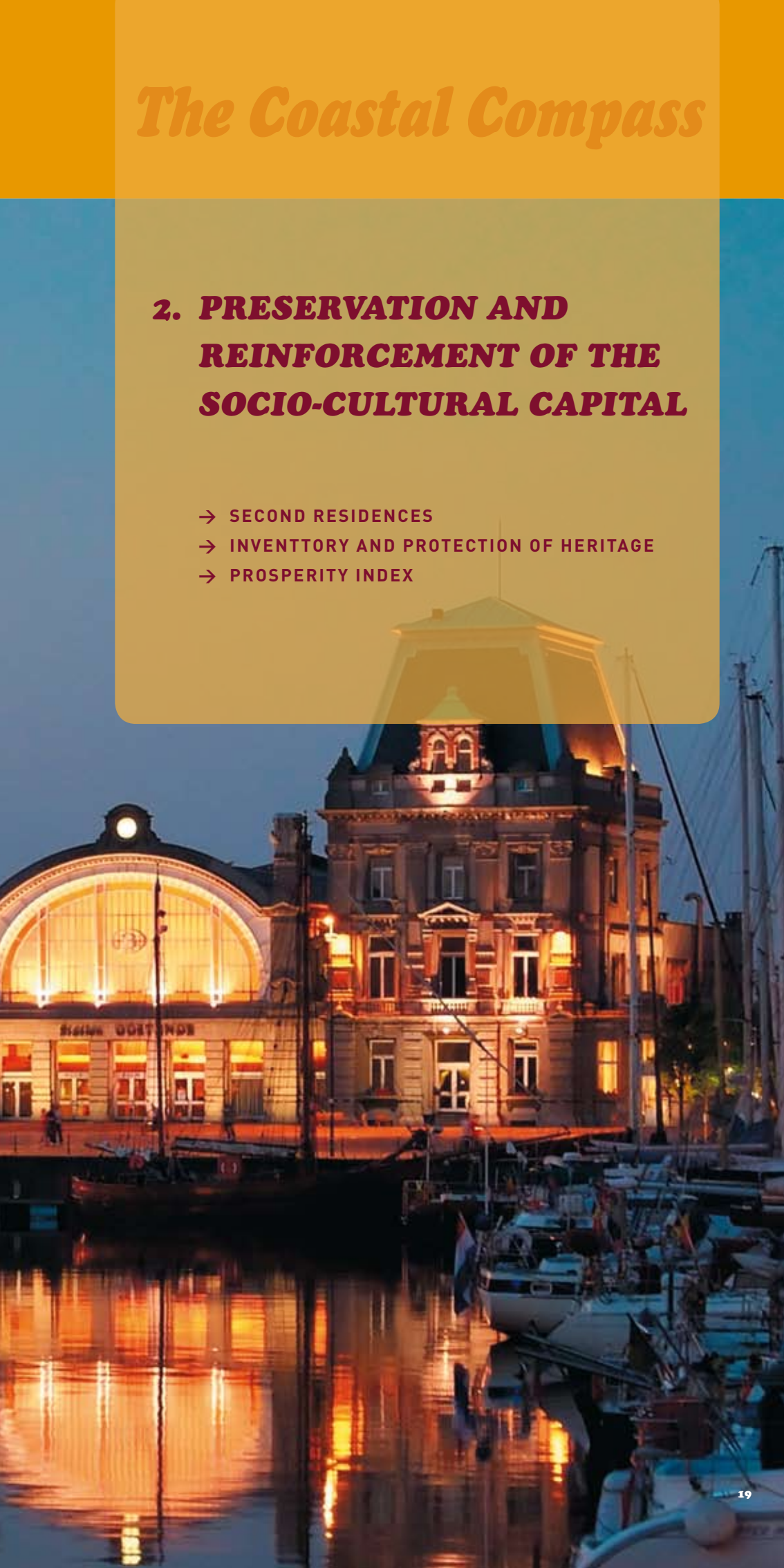
People with a handicap and elderly people constitute an important target group for the tourist sector. Because of the growing greying of society, this group will form an ever more important share of the tourist market. Reason enough to start work on an environment that complies with their needs.

2. PRESERVATION AND REINFORCEMENT OF THE SOCIO-CULTURAL CAPITAL

- → SECOND RESIDENCES
- → INVENTTORY AND PROTECTION OF HERITAGE
- → PROSPERITY INDEX



PRESERVATION AND REINFORCEMENT OF THE SOCIO-CULTURAL CAPITAL

2

→ WHERE DO WE WANT TO GO TO?

Equal opportunities and combating all forms of social exclusion and poverty is the goal to strive for in the further development of the coastal region. The key words here are collaboration on the one hand, and strong policy on the other hand. Because the different issues are so closely intertwined, working in an integrated manner is an absolutely necessary condition. The reinforcement of the social tissue and the preservation of the cultural capital constitute aspects of developing a sustainable society.

→ WHERE DO WE STAND TODAY?

Second residences and pension migration have a remarkable influence upon the social climate at the coast. **The seaside resorts are indeed very much wanted by tourists as temporary seasonal residences. That is why these towns have a much higher percentage of second residences than the average Westflemish municipality.** This situation entails specific problems. The strong demand for second residences makes the housing prices go up. Because of that, the coastal inhabitants wishing to buy a house at the coast have to compete with candidate-buyers of second residences. In the coastal municipalities the pressure upon land prices is so high that it becomes very difficult for young families to keep living there.

Another effect of the rising demand for second residences is the growing pressure upon the patrimony at the coast. The rebuilding of bought up elderly withered buildings into apartments creates a monotonous street sight. Unique architectural jewels with their own history all too often have to make way for monotonous buildings in brick and glass. During the winter months many second residences are not occupied, which creates ghost districts. From different angles, like e.g. action groups or the Flemish authorities, more and more attention is asked for the protection of the highly valuable immovable patrimony at the coast.

The coast is, however, also characterised by a second major trend, viz. **the inflow of pensioners who come to spend their 'old days' there.** Elderly people moving to the coast, leave their natural social network of family and friends behind. At the coast they build a new network of friends. But that is not a caring network. The consequence of this is that high-aged seniors cannot stay at the coast and they return to their region of birth.

The pension migration towards the coast combined to the moving away of the young inhabitants leads to a strong greying of the coastal population. The driving forces stimulating young people to leave the coastal region are mainly to be found in the fields of employment, environment and housing. A good mix of young and old is, however, very important in a healthy social and economic climate.

→ WHAT CAN WE DO?

In order to reinforce sustainablility in the coastal region, the social tissue needs to be broadened and the age mix must be further stimulated. Affordable housing is the principal prior condition to realise this social mix. Urban planning, grounds and premises policy, housing policy, fiscal and financial instruments can all make affordable housing at the coast possible. **This requires efforts from the local authorities to build out social housing and a social housing policy.**

The increase of the land and housing prices and the image of 'aging' districts or housing nucleuses are not exactly tempting youngsters to settle at the coast. That is why the coast should work on its image. Far-reaching communication about the poles of attraction the coast is offering young people can have stimulating effects: the availability of affordable housing, a well-built out public transport network (accessibility), an innovative entrepreneurial climate, information about the employment opportunities in the region (including yearly job and internship fairs for the target group), an attractive leisure and cultural offer, ...

In addition to the disturbance of the demographic balance the population greying also brings about additional challenges in the fields of leisure and care offer. The greying and lessened autonomy of a growing part of the population should urge the authorities as well as private entrepreneurs to develop specific and individual cut-to-measure care services. The increase of the number of elderly people does not only create a need for and creation of new jobs, but also extra income for the region.

SECOND RESIDENCES

TREND +/-

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→ WHY THIS INDICATOR?

The study 'Leefbaarheidsonderzoek aan de kust' *('Quality of Life Research at the Coast')* indicates that the social effects of the characteristics of the housing market cannot be underestimated. Thus the price, the quality and the type of home will amongst other things have an influence upon the composition of the population (age, income, family type, etc.). But also the characteristics of the inhabitants play a role in determining who will come to live there. Typical of the coastal municipalities is the big proportion of second residences. A large number of second residences with respect to the total number of permanent homes can be a measuring tool for social cohesion: the larger the proportion of second residences/ permanent homes, the more chance for the inhabitants to get isolated and not participate in community life. Reverse, we cannot conclude, however, that a large number of permanent homes by definition will bring a sound social housing climate. In addition to all of this, a large number of second residences also have an influence upon the housing cost and the social mix.

→ WHAT DOES THIS INDICATOR SAY?

This indicator gives an estimate of the number of second residences.

The percentage of second residences is estimated by counting the number of households. Departing from the idea that each household takes up one housing accommodation and that 3% extra housing accommodation is needed in order to make the movements in the housing market possible, 3% is added to the number of households in order thus to be able to estimate the number of necessary housing accommodation.

The estimated number of necessary housing accommodation is deducted from the actual number of housing accommodation. A positive result shows the estimated number of second residences. A negative result presupposes a general shortage of housing accommodation. The fragmentation of the housing market into various different partial markets (e.g. renting/owning houses; primary/secondary housing quality, etc.) is not taken into account in this respect. According to the characteristics of the resident, some of these partial markets are not open to him. As a consequence, there can be a surplus in one partial market and a shortage in another one at the same time. An in-depth analysis of these partial markets within the scope of this publication would lead too far, though.

→ WHAT ARE THE RESULTS?

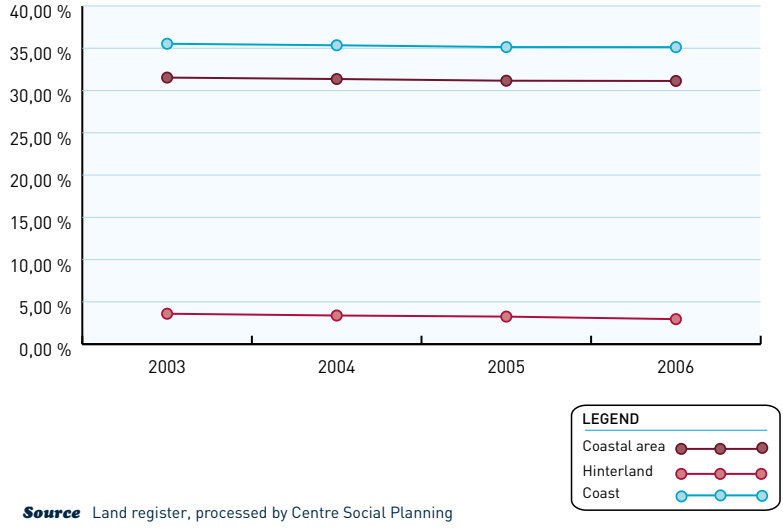
Despite the increase of the number of housing possibilities between 2003 and 2006, at the coast as well as in the hinterland, the number of second residences in both regions is slightly decreasing. Following the estimate, the coastal municipalities have an average of 35% of second residences in 2006 as compared to 2.9% for the hinterland. The spreading of the second residences over the coastal municipality is not everywhere the same. In Bruges and Bredene, for instance, it is estimated that there are not even 5% of second residences, whereas seven out of ten coastal municipalities have over 44 % of second residences. In the hinterland Alveringem is the only municipality with more than 4.9 % of possible second residences in the total of the housing accommodation.

→ WHAT ABOUT THE FUTURE?

The estimate of the number of second residences (calculated vis-à-vis all housing accommodation) shows that this share yearly decreased between 2003 and 2005. The decrease of the share of second residences is, in the light of the reinforcement of social cohesion and the affordability of living at the coast, a good thing. Despite the decrease of the number of second residences, six out of the ten coastal municipalities still have more than 50 % of second residences. A policy directed at the structuring of second residences will not only turn out to be beneficial for the housing market (affordable housing), but will also offer solutions in addressing a great number of issues that are very typical of the coast (e.g. hidden poverty, reinforcement of social cohesion, attracting young families). A well-thought out policy with special attention for the policy regarding second residences and with attention for a wider offer of affordable housing for young families is essential to promote the livability of the coastal municipalities.

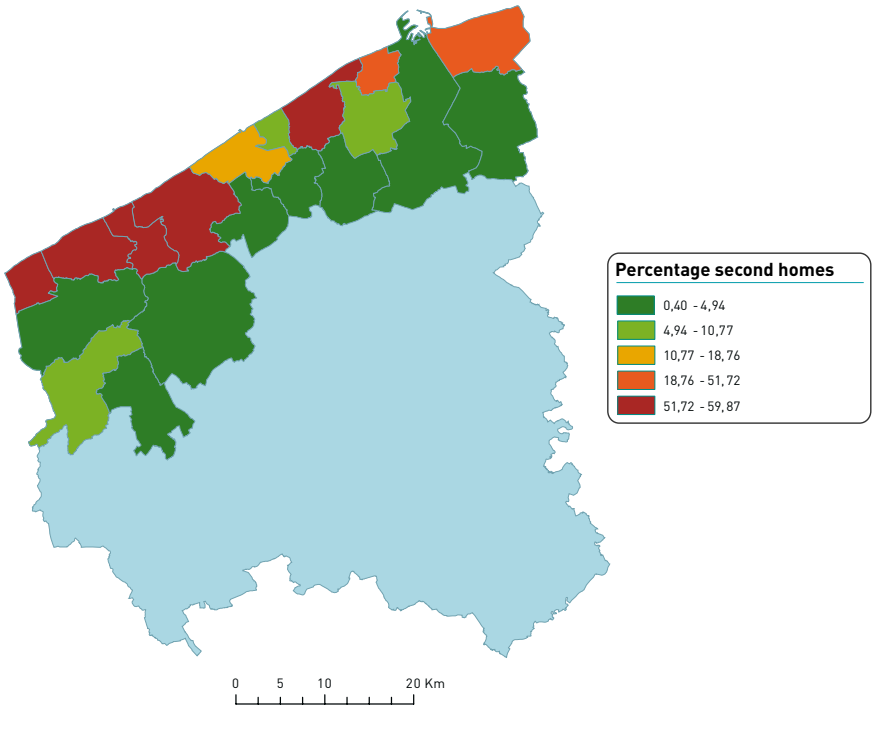
In 2006 the coastal municipalities had a number of 152,552 households. Taking into account the frictional lack of occupancy of 3 % in order to catch up relocation shifts in the housing market, the number of dwellings needed is estimated at 157,129. According to the land register the coastal municipalities had 242,238 items of housing accommodation in 2006. At first sight this seems more than enough to provide all households with housing accommodation. And yet, the housing market is under great pressure. However, the large number of second residences does not only have negative consequences for the housing market. Because the greater part of the accommodation is only temporarily in use (e.g. at the weekends or during the holidays), the residents neither have the time nor any interest to integrate within the local community. This has negative consequences for community life. This can amongst other things be told from a lower participation in local social life (associations, organisations, etc.) or in less social control.

Graph **Evolution second homes, 2003-2006**



Source Land register, processed by Centre Social Planning

Map **Percentage second homes, 2006**



Source Land register, processed by Centre Social Planning

PROTECTION OF ARCHITECTURAL PATRIMONY

TREND +/-

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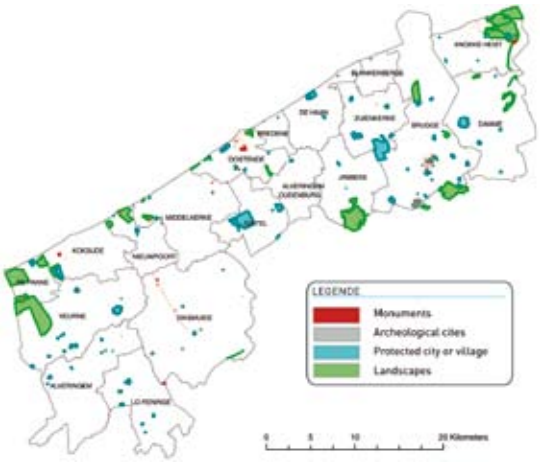
Lecturer *Linda Van Santvoort*
(Ghent University - lecturer history, architecture and preservation of monuments and historic buildings)

Since 1977 the building of the coastal zone is stepwise inventoried. In the period 2000 – 2005 the inventory campaigns were followed immediately by a selection of protections per municipality. Current policy opts for a themed approach across the borders of municipalities and provinces, with the example of the protection of three holiday homes at the coast.

Map **Protected monuments, landscapes and city or village in the coastal zone**



Source Flemish government, Agency R-O, F. Carpentier

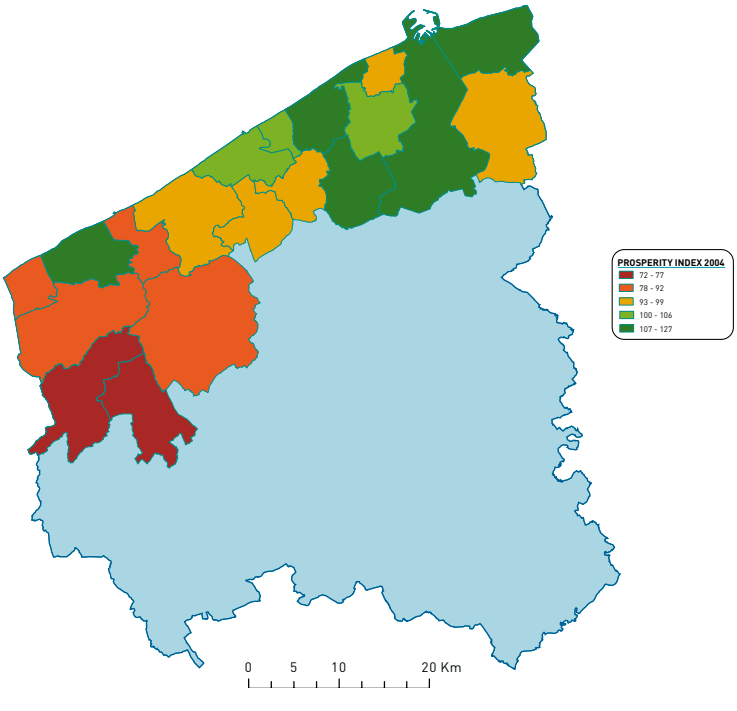
PROSPERITY INDEX

TREND +/-

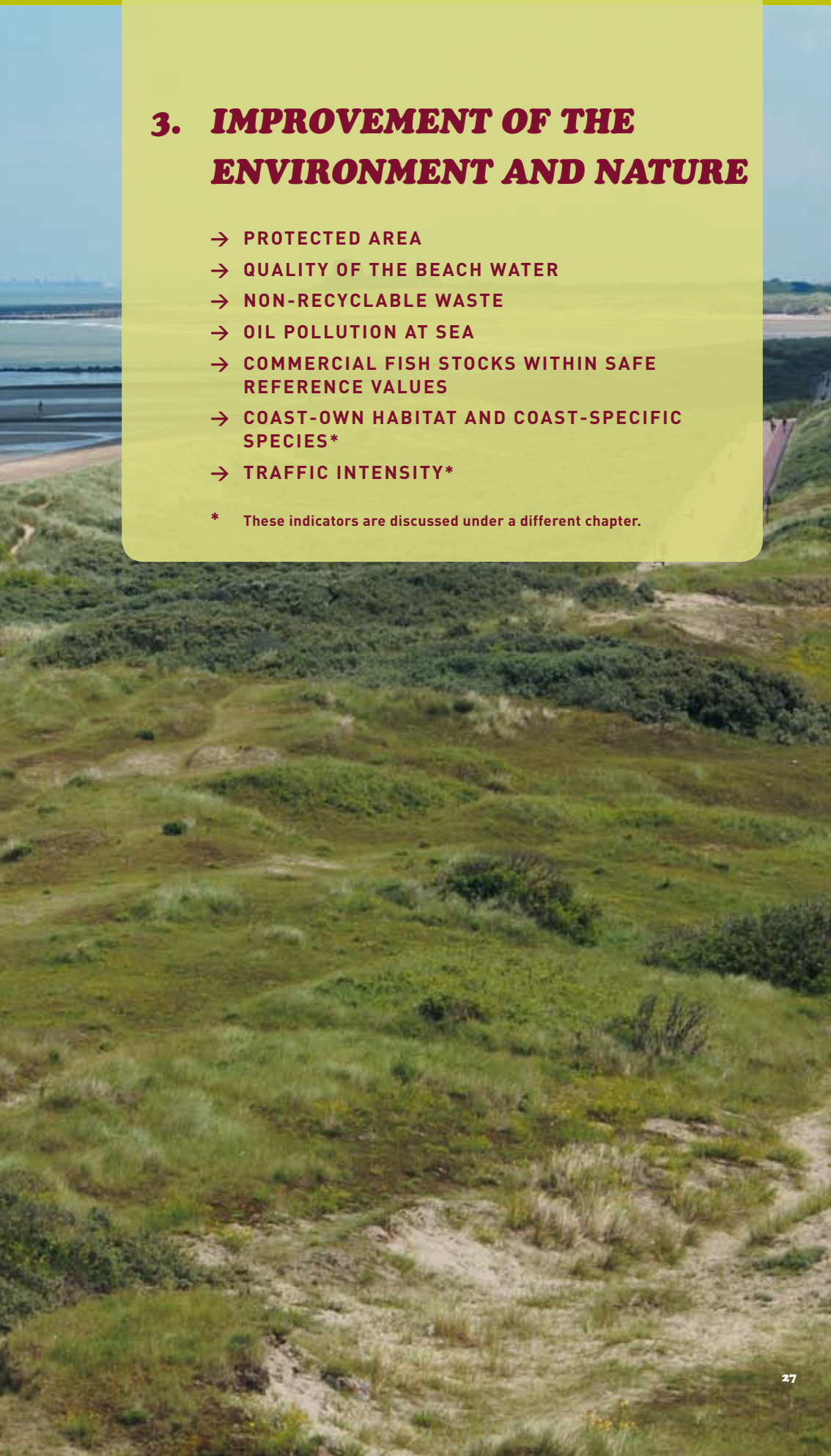
Author *Stefanie Rammelaere*
(Centre Social Planning - Province of West Flanders)
Lecturer *Sarah Carpentier, Karel Van den Bosch*
(Centre Social Policy - Antwerp University)

In comparison with the average Belgian income the average fiscal income per person between 1997 and 2004 has known a positive evolution. This increase applies to the coastal municipalities as well as to the hinterland and to the province of West Flanders as a whole. The increasing prosperity index also teaches us that the evolution goes faster in West Flanders and at the coast than elsewhere in Belgium. Yet, within West Flanders there are still very distinct regional differences. The prosperity index of the coastal municipalities is generally higher than that of the hinterland municipalities. But within these two regions there are also remarkable differences between the average income of municipalities.

Map **Prosperity index, 2004**



Source Ecodata, FPS Economy, SME's, independent Professions and Energy, SVR: bevolkingskubussen; processed by Centre Social Planning - Province of West Flanders



3. IMPROVEMENT OF THE ENVIRONMENT AND NATURE

- → PROTECTED AREA
- → QUALITY OF THE BEACH WATER
- → NON-RECYCLABLE WASTE
- → OIL POLLUTION AT SEA
- → COMMERCIAL FISH STOCKS WITHIN SAFE REFERENCE VALUES
- → COAST-OWN HABITAT AND COAST-SPECIFIC SPECIES*
- → TRAFFIC INTENSITY*

* These indicators are discussed under a different chapter.

IMPROVEMENT OF THE ENVIRONMENT AND NATURE

3

→ WHERE DO WE WANT TO GO TO?

Within attractive quality surroundings and in a healthy climate man and nature can develop in an optimal way. This presupposes rational handling of space and environmental capital (such as water, raw materials or energy). By avoiding the pollution of air, water and soil, the quality of the environment is improving. Biodiversity must also be protected and promoted.

→ WHERE DO WE STAND TODAY?

Many habitat types in the coastal zone are priority habitats for Europe, along the seaside (the sandbanks) as well as along the landside (the dunes).

Along the seaside there is a growing awareness of the ecological importance of the coast and the sandbanks when it comes to productivity and biodiversity. After two years of consultation the North Sea Master plan of 2005 provided in the further extension of the share of protected areas at sea by means of new demarcations.

Extra protection is necessary, because the natural ecosystem of the sandbanks is being threatened from different angles. Thus the trawl fishery damages the seabed and the seabed life in a serious manner. Measures with regard to the fishery, however, often appear to take only short-term national interests to heart. Of course, this naturally has a number of consequences for the fish stocks and therefore also for the socio-economic perspectives for fishery in the long term and in the future.

Like the coastal water and the sediment, sandbanks, too, are threatened by pollution. The influx of pollution comes from surface water or from untreated wastewater during heavy precipitations. Along the seaside (intentional or accidental) oil dumping is threatening water quality. It is not only nature that suffers from the pollution. The coastal economy and the image of the coast suffer severe damage from it, when e.g. swimming zones are threatened with closing.

At sea there already is an increased vigilance for oil pollution. The monitoring is also supported by European and international legislation. Every offence is reported. The number of effective legal prosecutions, however, remains fairly low. In combination with high fines for deliberate oil dumping, they constitute a strong deterrent for potential polluters.

Along the landside, the remaining dunes complex at the coast is especially of ecological importance. The dunes ecosystem, which is both influenced by the hinterland and the sea, forms the habitat for unique floral and fauna species, such as the sea spurge and the tern. Over ten percent of all species in Flanders have a preference for the coast. The dunes decree and the purchasing policy of the Flemish authorities offer guarantees for the protection of the dunes. The dunes ecosystem is still facing damaging effects, however, such as salinisation, fragmentation or thicket advancing off the coast.

→ WHAT CAN WE DO?

Nature and the environment at the coast are under a lot of pressure. **That is why the various different human activities must be managed in such a manner that they remain compatible with the protection and sustainable use of the marine and coastal environment.** The dunes decree and purchasing policy help in the further preserving and laying out of nature, with a view to both biodiversity and soft recreation.

In order to arrive at good results, a further sensitisation of all parties involved is necessary. Further elaboration of the provisions for nature and environmental education, such as visitors' centres, function as keys to sensitise the public at large. Sustainable development education must be integrated within the current educational offer, e.g. by means of an environmental biking route with focus on sustainable projects.

The water quality is affected from the landside as well as from the seaside. Measures are therefore necessary along both sides. Pollution can be reduced through the extending of the treatment of urban wastewater, by reducing the draining water from agriculture, and by further addressing the dung issue. Over the coming years a restricted number of optimisation projects will be carried out, which may still have a positive impact upon the quality of the beach water. Amongst them are the construction of separate sewage systems, uncoupling of surface water and rainwater etc.

Further protection of nature at the coast must create new chances to counter fragmentation. Conservation objectives and nature layout plans give concrete shape to the protection measures. Small-scale projects can integrate nature into agriculture and land use. In that way, specific management of field edges can become beneficial to e.g. the field-bird stock. Striving for management measures in private dunes, too, is necessary to prevent these dunes surfaces from being turned into gardens. The efforts to counter fragmentation, such as the layout of green passages and the delineation of the Flemish Ecological Network are positive. They can only be applauded. Further financial means for monitoring and maintenance of the biodiversity are, however, equally necessary.

NON-RECYCLABLE WASTE

TREND

Author *Roel Vaes*
(Public Waste Agency of Flanders - OVAM)
Lecturer *Jan Pieters*
(Biosystems Engineering, Ghent University)

→ WHY THIS INDICATOR?

Large amounts of waste have to be collected and processed. The eventual elimination of these waste materials (burning or dumping) has a serious impact upon the environment: loss of resources and energy, emissions into the soil, water and air, taking in of space. Emissions are strictly limited but unfortunately require the use of extra resources and energy. One of the objectives of waste materials policy is to limit the total amount of waste to be dumped or burned. This can be done by preventing waste as much as possible, or by selective collection with a view to reusing, composting, or recycling the waste. The waste that is left after all will be processed with a view to maximal energy recuperation.

→ WHAT DOES THIS INDICATOR SAY?

The indicator expresses the waste amount that is burned or dumped per inhabitant and is directly related to the individual production of waste and the consumption pattern. A decreased amount of waste is also an indication of waste prevention and selective collection. In concrete terms this indicator is defined as the total amount of terminally removable waste (= household garbage, gross garbage, communal garbage, sorting residue of PMD), regardless of the way it is collected (door-to-door, container park, etc.), divided by the number of inhabitants per municipality.

The "Uitvoeringsplan Huishoudelijke Afvalstoffen 2003-2007" *('Implementation plan Household Waste materials')* proposes the following objectives for waste:

- 165 kg/inht at the Flemish level with a maximum of 200 kg/inht at the municipal level in 2005;
- 150 kg/inht at the Flemish level in 2007. The maximum of 200 kg/inht at the municipal level is maintained.

→ WHAT ARE THE RESULTS?

The municipalities in the coastal zone have already travelled a long way in reducing waste. In 1994 they produced an average of 462 kg waste/inhabitant against 224 kg in 2006. Yet these figures are still well above the average for West Flanders (163 kg/inhabitant) and the Flemish Region (155 kg/inhabitant). The target figure of the Implementation plan, too, viz. a maximum of 200 kg waste in 2005, is still far away for the municipalities of the coastal zone (Graph). Next to that, the long-term objective to reduce waste to 150 kg/inht in 2007 is still far out of reach. The hinterland municipalities produced an average of 163 kg waste/inhabitant in 2006. Between 2005 and 2006 the quantity of waste decreased in the greater part of the hinterland municipalities.

More and more municipalities are therefore introducing one or other form of diftar (introducing the 'the polluter pays' principle) in order to stimulate their citizens to avoid waste or selectively collect it. The coastal municipalities have an increased household waste production as a consequence of the presence of tourism. This in its turn has for a consequence that these municipalities have difficulties to meet the objectives relating to prevention, selective collection and final processing. In order to take the influence of tourism upon the production of garbage into account, correction factors are attributed to the coastal municipalities. These correction factors are an estimate of the tourist impact. Despite these correction factors five coastal municipalities do not comply with the 2005 objective of maximally 200 kg/inhabitant in the year 2006. Yet this maximum is coming more and more within reach for these coastal municipalities. In addition to the correction factors, ever more coastal municipalities are considering the amount of comparable waste garbage they collect among small self-employed businesses and SME (cafés, restaurants, bakeries, etc.) separately. This is a way to make their amount of waste decrease substantially.

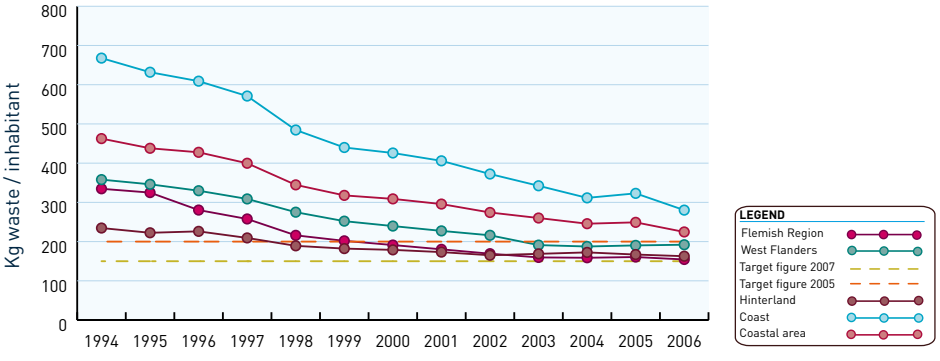
→ WHAT ABOUT THE FUTURE?

In order to comply with the objectives of the municipalities and intramunicipal collaborations in the coastal zone, extra efforts are expected to decrease the amount of garbage that must be removed. In the coastal action plan concrete actions are bundled, which the coastal municipalities and intracommunals elaborated in collaboration with OVAM to thus obtain a sufficient decrease of garbage production. In this way, the (selective) collection e.g. is optimised and adjusted during the tourist season. An example of this is the innovative project in which a number of eight measures with respect to packaging waste are further elaborated together with FOST Plus (more frequent collection of paper and cardboard, smaller PMD bags, garbage islands, waste guide, etc.).

Through diftar the citizens are stimulated to prevent and better select garbage (because that is cheaper). The diftar is calculated on the basis of the processing costs of the waste: 0.15 EUR/kg of waste or 1.25 to 1.5 EUR per bag of 60 litres. In this manner the processing costs are completely charged to the consumer. So there are a great number of policy measures available to reduce the amount of terminally removable household waste materials. The municipalities (and not in the least the ones at the coast) should therefore strive towards an optimal instrumental mix of sensitisation, information, the offering of facilities, tariffing and maintenance. In 2007 work was also done on a new Implementation plan for household waste from 2008 onwards. In the draft Implementation Plan the terms of reference for waste at the municipal level will be further sharpened as from 2010, from 200 kg/inht to 180 kg. If these terms of reference are ratified by the definitive Implementation plan, the coastal municipalities will certainly have to make special efforts. On the other hand, the correction factors of the (coastal) municipalities are being reviewed within the framework of the preparations for the new Implementation plan. These will apply from the moment the new Implementation plan will take effect. They will, moreover, be adjustable on a yearly basis, if necessary.

In 1994 the coastal municipalities produced an average of 462 kg waste/ inhabitant as opposed to 224 kg in 2006. Yet these data are situated far above the Westflemish and Flemish average, of 163 and 155 kg respectively per inhabitant.
The increased household waste production of the coastal municipalities must be attributed to tourism. That is why the municipalities have difficulties to meet the objectives of prevention, selective collection and final processing. In order to take the influence of tourism into account to at least a certain extent, correction factors are allocated to the coastal municipalities. Despite these correction factors, 5 coastal municipalities do not comply with the 2005 objective of maximally 200 kg/inhabitant for the year 2006.

Graph **Evolution of waste figures, 1994- 2006**



Source OVAM

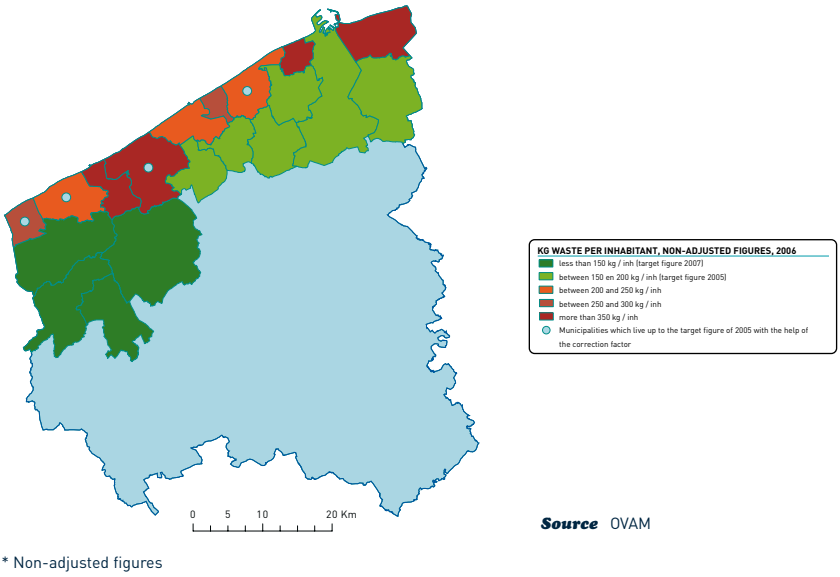
Schedule **Correction factors for tourism and coastal municipalities' waste figures**

MUNICIPALITY	CORRECTION FACTOR	KG WASTE/ INHABITANT IN 2006	ADJUSTED KG WASTE/INH 2006
Blankenberge	1,46	308,09	211,02*
Bredene	1,25	264	211,20*
Brugge	1,1	196,97	179,06
De Haan	1,7	240,65	141,56
De Panne	1,6	278,5	174,06
Knokke-Heist	1,5	307,48	204,99*
Koksijde	1,63	239,71	147,06
Middelkerke	1,79	342,99	191,61
Nieuwpoort	1,67	362,63	217,14*
Oostende	1,14	237,12	1208,00*

* Municipalities which do not live up to the terms of residence of 200 kg/inh, despite the correction factor

Source OVAM.

Map **Kg of waste per inhabitant 2006 ***



Source OVAM

* Non-adjusted figures

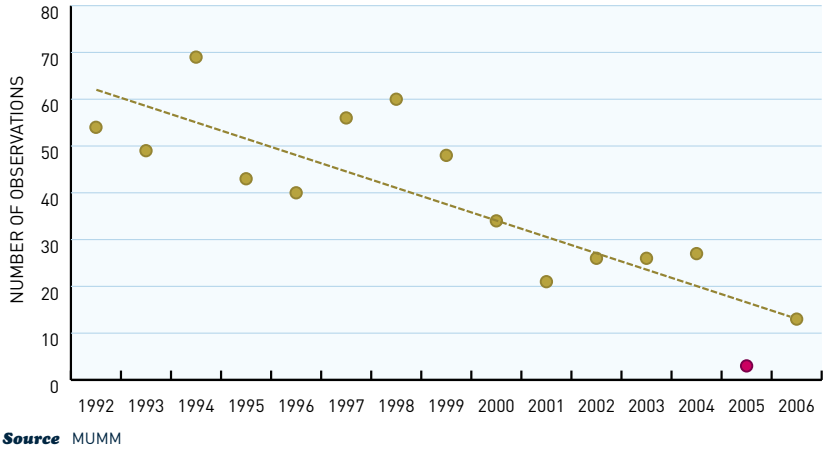
OIL POLLUTION AT SEA

TREND +/-

Author *Machteld Price, Jean-Pierre Vogt (MUMM - BMM)*
Lecturer *Gert Verreet (European Commission - DG Environment)*

The North Sea forms a special area where there is not any visually observable operational oil dumping allowed (MARPOL 73/78 legislation). Yet, in 1992 54 sessions of oil dumping were recorded from the sky. In 2006 only 13 oil dumping sessions were observed within six months' time. The yearly estimated oil volume also shows a decreasing trend. The stronger measures and the increased control apparently have a positive effect.

Graph **Number of observed oilspills, 1992-2006**



Source MUMM

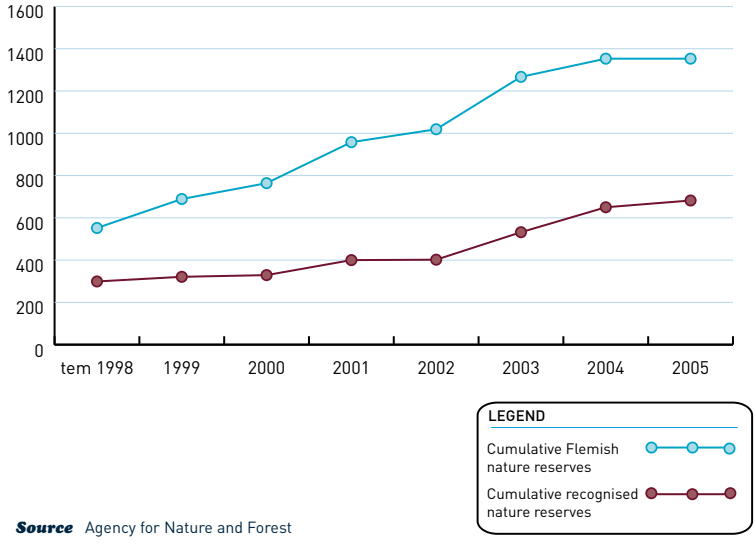
PROTECTED AREA

TREND +/-

Author Toon Van Daele
(Research Institute for Nature and Forest)
Lecturer Maurice Hoffmann
(Research Institute for Nature and Forest)

Presently, acknowledged and Flemish appointed nature and marine reserves offer the best protection for the ecosystems of the coastal region. 21% of the total surface of the coastal municipalities benefit from one or other form of nature conservation protection. For the municipalities of the hinterland this percentage amounts to 15.4 %. In August 2006 the Agency for Nature and Forests of the Flemish authorities purchased the Zwin, former property of the Compagnie the Zoute. In 2005 the first forest reserve of 63 ha was laid out in the dunes area of Middelkerke.

Graph **Area surface of recognised nature reserves (private organisations) and Flemish nature reserves in het coastal zone (Flemish government)**



Source Agency for Nature and Forest

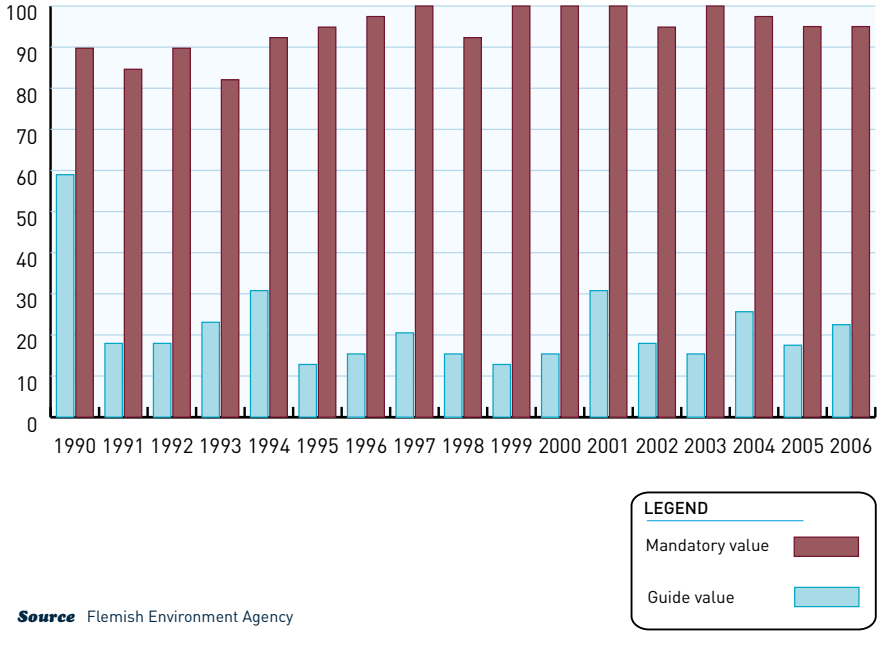
QUALITY OF THE BEACH WATER

TREND +/-

Author Martin Verdievel
(Flemish Environment Agency - VMM)
Lecturer Koen Schoeters and Gerrit Tilborghs
(Flemish Agency for Care and Health)

In 2006, 22.5 % of the investigated measuring places in the bathing zones at the coast complied with the European target figure. This is an improvement when compared to 2005: at that time only 17.5 % complied with the target figures. As concerns the (mandatory) European minimum standard, all seaside resorts have a good score: in 2005 as well as in 2006 they reached 95 %. This implies that over the last ten years some 20 % of the bathing zones complied with the target figure and 95 to 100 % complied with the minimum standards.

Graph **Percentage of bathing waters compliant with the Guide value and the Mandatory value, 1990-2006**



Source Flemish Environment Agency

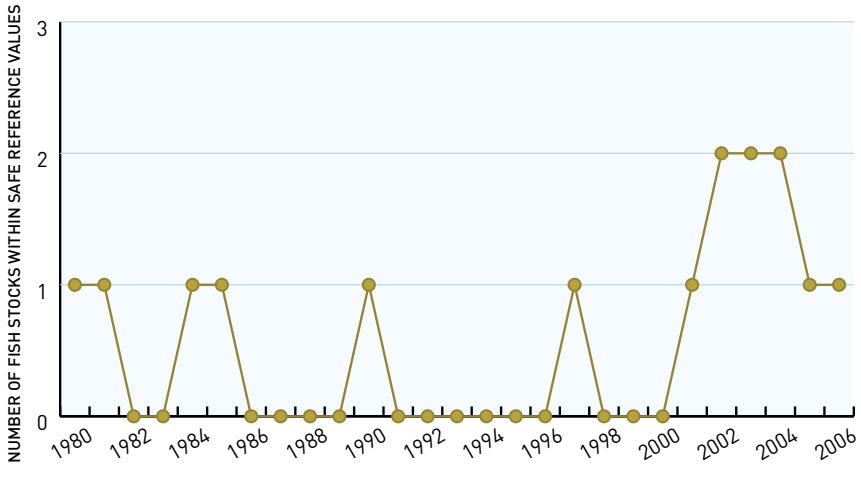
COMMERCIAL FISH STOCKS WITHIN SAFE REFERENCE VALUES

TREND

Authors *Frank Redant and Wim Demaré*
(Institute for Agricultural and Fisheries Research - ILVO)
Lector *Filip Volckaert*
(Katholic University Leuven)

In the North Sea, the number of commercial fish stocks within safe reference values is low, with maximally 2 out of 7. In 2006 only haddock complied with the criteria. For herring, mackerel, cod, whiting, plaice and sole the fishery pressure was either too high or the biomass was too low to be able to measure up safe reference values. The low fish stocks are damaging the marine ecosystem in a measurable and long-term way. The sustainable management of the fish stocks is a collective responsibility, to which all involved fishing countries must contribute in solidarity.

Graph **Commercial fish stocks within safe reference values (North sea and adjoining areas, 1980-2006)**

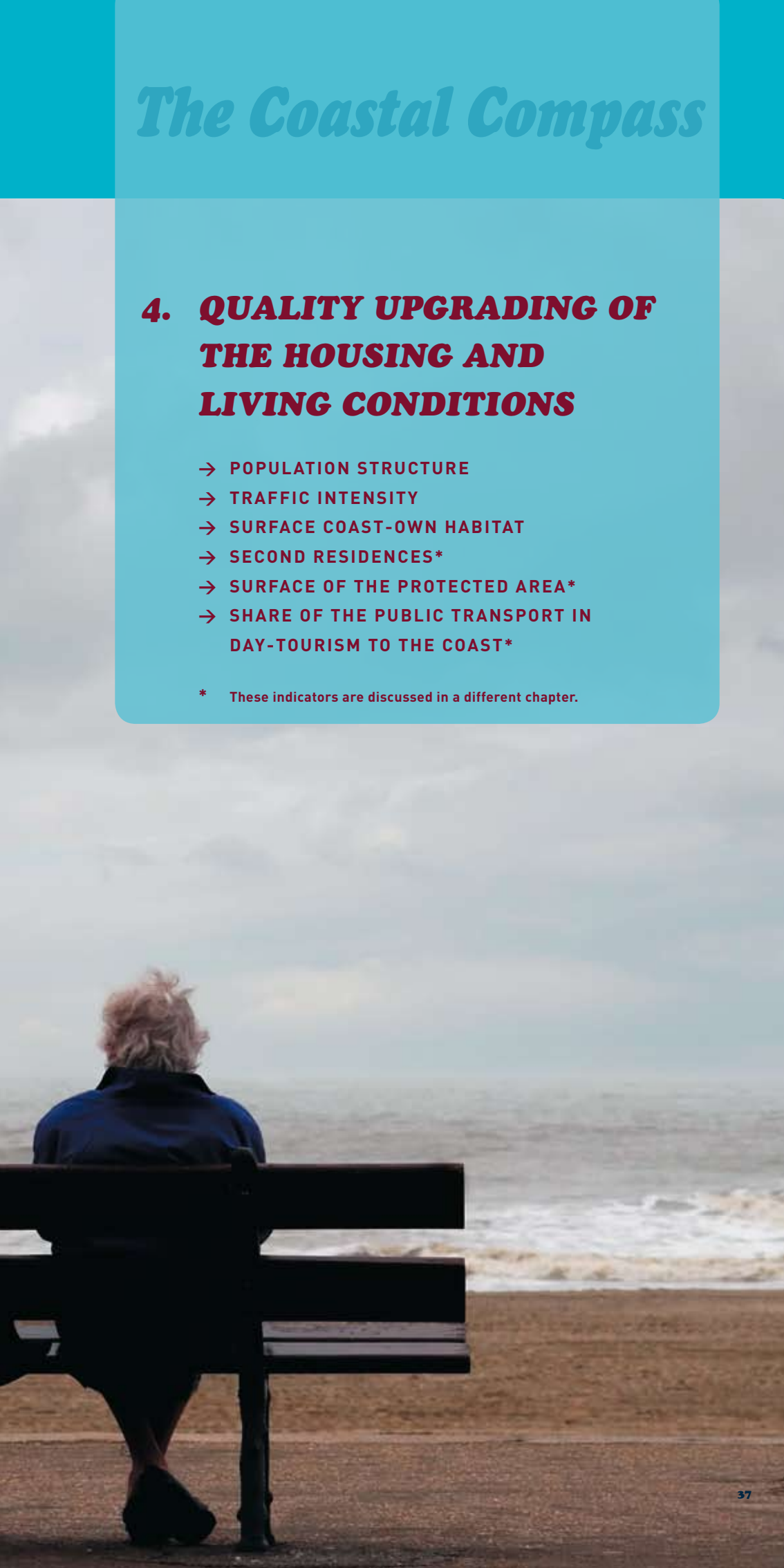


Source Anon. 2006. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES Advisory Committee on Fishery Management, Doc. ACFM:35, 1172 pp.

4. QUALITY UPGRADING OF THE HOUSING AND LIVING CONDITIONS

- → POPULATION STRUCTURE
- → TRAFFIC INTENSITY
- → SURFACE COAST-OWN HABITAT
- → SECOND RESIDENCES*
- → SURFACE OF THE PROTECTED AREA*
- → SHARE OF THE PUBLIC TRANSPORT IN DAY-TOURISM TO THE COAST*

* These indicators are discussed in a different chapter.



QUALITY UPGRADING OF THE HOUSING AND LIVING CONDITIONS

4

→ WHERE DO WE WANT TO GO TO?

The coastal region is characterised by specific social and living environment issues. It is not evident to find the right balance between the various different sectors. Yet a harmonic society must be the striving goal: a living environment where it is good and pleasant to live for everyone, with attention towards the different population groups. **A quality living environment with a sufficient number of meeting opportunities and adjusted housing accommodation will contribute to a well-balanced society.**

→ WHERE DO WE STAND TODAY?

A strip of apartment buildings along the seafront: that is the typical image that many visitors of the coast take home with them. **Indeed, with its high building along the waterline the coast is characterised by a strong, linear urbanisation with a high population density.** Original elements of the coastline, such as natural sea defence, dunes and beach complexes were largely included in the existing building.

But the remaining open space is also under pressure. **Because of the high housing prices at the coast the pressure upon the housing market relocates to the hinterland.** That is why various local authorities are interested in cutting the remaining open space for different purposes, such as allotments or industrial sites.

Over the previous decades the quality of the open space, such as the view of public places and the integration of different user options, has strongly declined. Elements that make up the choice of a living place for young families have not been valued much, e.g. the layout of public space. **Through lack of attention for the public space certain districts have lost their appeal.** Changes are on their way, though. Some public authorities have in the meanwhile strongly invested in the quality of the living environment. In various different town districts adjustments have been made with a view to upgrading the quality of life. In the St. Pieters quarter in De Panne, for instance, space was created for new playing and meeting functions. This trend is on its way.

For the local population traffic feasibility and traffic safety constitute an important aspect of a quality living environment. Too often the coast is confronted with traffic jams, parking problems or cut-through traffic. For the inhabitants of the coast these phenomena lessen the attractiveness of their living place.

→ WHAT CAN WE DO?

Along the coast there are still striking terrain switches from sea and beach towards the dunes. These places must be safeguarded, because the links between and around the seaside resorts are structurally determining. The open space behind the urbanised coastal strip must also be preserved and urbanisation of the polders must certainly be avoided. **The development of urban areas at the coast can continue in a selective way. An optimal use of the existing urban structures will allow this, with a specific bundling of functions and provisions.**

In many coastal municipalities the revaluation of the public domain is an important item on the agenda of urban planning policy. The implementation of this is, however, a work of many efforts. And yet, the renovation of the public domain is too often still aiming at the mere dressing of public space, not in the least the commercial parts of it. **Upgrading the spatial quality, in order to upgrade the quality of life in the seaside resorts must start from a global approach, though, with attention for the different functions.**

Traffic and mobility must be reflected on in a comprehensive and integrated manner, too, in the further development of the different functions in the coastal zone. Tourist traffic, commuter traffic as well as industrial transport must be tackled by well-directed actions. The further promotion of the large border car parks can help process the busy tourist car traffic. The coast will also become more liveable by keeping intense traffic away from the residential areas and by devoting extra attention to weak traffic participants, like bikers and pedestrians.

POPULATION STRUCTURE

TREND +/-

Author *Stefanie Rammelaere*
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Lecturer *Piet Bracke*
(Ghent University)

→ WHY DIS INDICATOR?

The aging rate is a demographic indicator representing the relation between the number of inhabitants older or equalling 60 and the number of inhabitants younger than 20 years of age. An aging rate higher than 100 means that there are more 60-+ citizens than <20-year-olds in that particular region. Reverse, a value under 100 refers to a smaller amount of 60-+ citizens than <20-year-olds. When the indicator is 100, both groups are equal in size.

→ WHAT DOES THIS INDICATOR SAY?

The aging rate gives an insight into the demographic balance and the demographic dynamics of a certain area. The population structure undeniably exercises an influence upon social, economic and political life. The number of young people has repercussions on amongst other things the need for child day-care and school infrastructure. The number of elderly people will help determine the need for adjusted housing and home care. Adolescents determine the influx on the labour market while the elderly form the group of old age pensioners. The makeup of the population has its impact upon quite a number of policy fields, such as housing, economy, care, employment and leisure.

→ WHAT ARE THE RESULTS?

Between 1996 and 2006 the greying rate increased in every region that was studied. The coastal municipalities had the highest increase. In concrete terms this means that the population is subject to aging. This is the result of two demographic trends: on the one hand there is the ungreening of the population (the number of <20-year-olds is decreasing yearly) and on the other hand there is the greying of the population (the number of 60-+ citizens is increasing). Both trends are occurring at the same time.

A second observation relates to the difference between the coastal municipalities and the hinterland. The map clearly shows that the coastal municipalities have a higher aging rate than the hinterland municipalities. To put it even stronger: in those coastal communities where the number of 60+ citizens exceeds the number of <20-year-olds (the average aging rate being 141) the hinterland municipalities still have a younger population structure: the aging rate does not exceed 100.

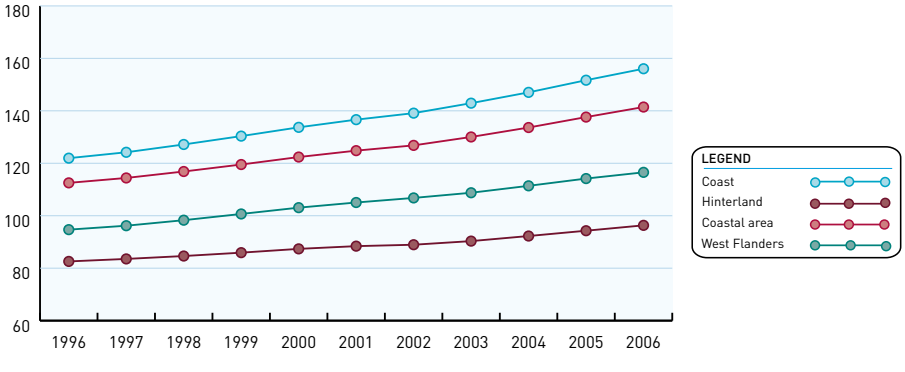
→ WHAT ABOUT THE FUTURE?

According to the prognoses of the Study Department of the Flemish Government the aging rate will keep increasing over the coming years. For the coastal municipalities it will reach 200 in 2015, which implies that in those municipalities there will be almost twice as much 60-+ citizens as <20-year-olds. For the hinterland municipalities an aging rate of above 100 (122.68) is also expected for 2015, yet they will still have a younger population than the overall West Flanders average (181.69).

Next to these prognoses the following remarks must be formulated: for a number of years now, we have seen a large attractive power of the coast upon senior citizens. A distinction must be made, however, between active and care needing seniors. The age-specific migration figures indeed show a positive migration ratio for the age group of 60- to 80-year-olds. For the group of 80-+ seniors this migration figure is negative. In other words: more 80-+ seniors are leaving the coast than arriving at it. These migration patterns indicate that the active seniors are going towards the coast, but as soon as they become care needing they leave the region again. Which causes can be indicated for this action is a research question in its own, which we cannot instantaneously solve. Still, the above conclusion must be taken into account when developing a senior citizen policy at the coast.

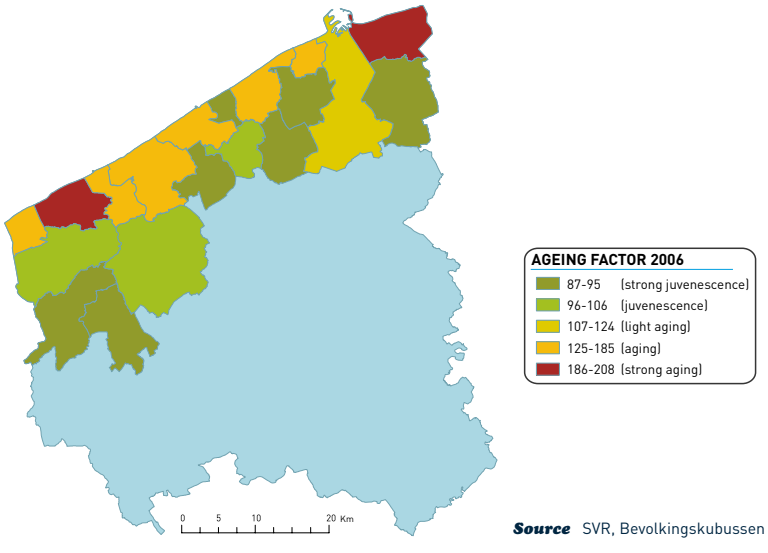
West Flanders is characterised by a growing greying. Year upon year the number of elderly (60-+ citizens) increases when compared to the number of youngsters (<20-year-olds). In 2006 West Flanders had 116 inhabitants older than 60 for every 100 <20-year-olds. This greying phenomenon does not occur to the same degree in all West-Flemish municipalities, though. With an average aging rate of 141 the coastal communities have an older population structure than the hinterland municipalities with their rate of 96. The typical population structure of the coastal municipalities also has an impact upon other domains, such as housing, economy, care, employment or leisure.

Graph 1 **Evolution of the ageing factor, 1996-2006**



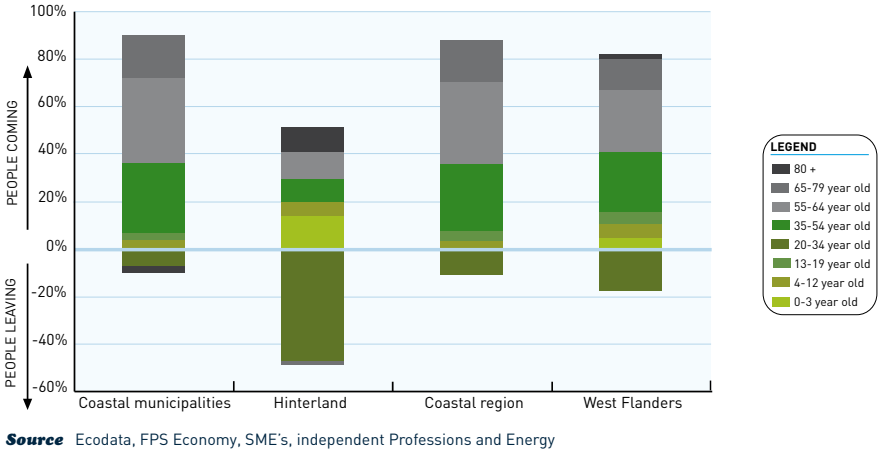
Source SVR, Bevolkingskubussen

Map 1 **The ageing factor in the coastal region, 2006**



Source SVR, Bevolkingskubussen

Graph 2 **Migration pattern according to age, 2004**



Source Ecodata, FPS Economy, SME's, independent Professions and Energy

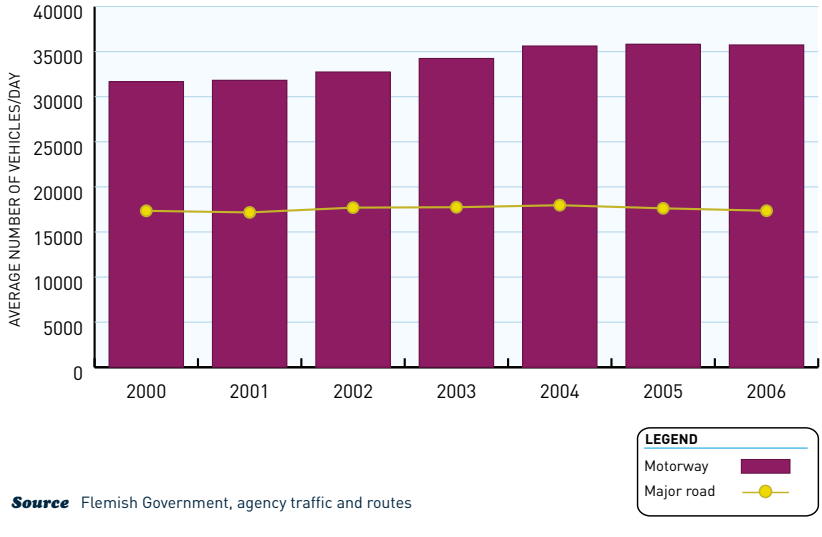
TRAFFIC INTENSITY

TREND +/-

Author *Stijn Goossens*
(Mobility and Public Works - Department Traffic knowledge)
Lecturer *Eddy Klijnen*
(Flemish Foundation for Traffic Knowledge)

Mobility is a basic pillar of the economy. Not only commuting and transit traffic play their role here. There is also recreational traffic to consider. There is a strong growth of traffic on the motorways to the coast (with the exception of Oostkamp-Bruges). This growth runs parallel to the growth of the motorway use throughout West Flanders (4.4 %). In Flanders this increase was limited to an average of 2.8 %. Regional road traffic to the coast declined this year by 1.5 %. This result contrasts with the zero growth throughout West Flanders province. In Flanders this evolution amounted to +0.2 %, excluding the Antwerp town belt.

Graph **Evolution of the average number of vehicles on coastal motorways and major roads, 2000-2006**



Source Flemish Government, agency traffic and routes

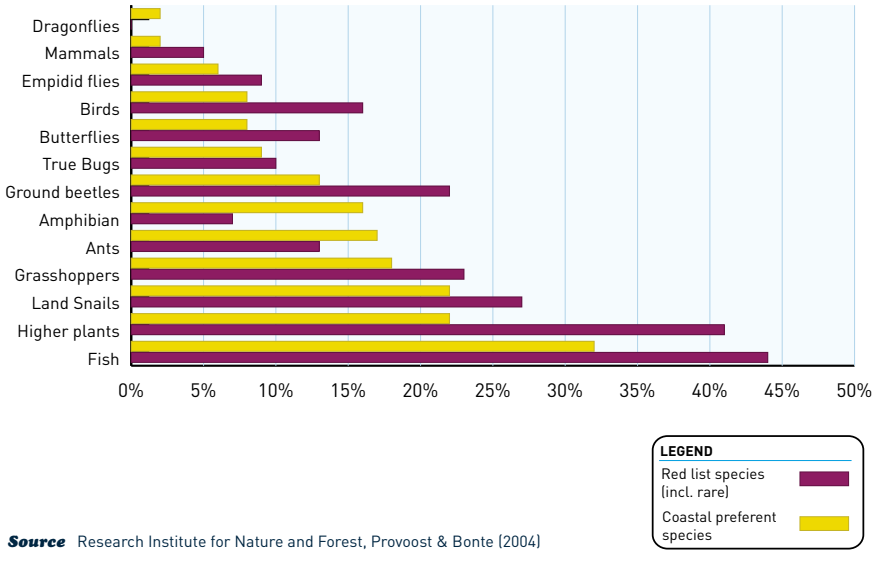
COAST-OWN HABITAT AND COAST-SPECIFIC SPECIES

TREND

Author *Sam Provoost*
(Research Institute for Nature and Forest)
Lecturer *Maurice Hoffmann*
(Research Institute for Nature and Forest)

The coast is of great importance as regards biodiversity in Flanders. A large number of organisms significantly occur more often at the coast than they do inland. A substantial number of them are even completely dependent of the coast. The inventory of fauna and flora at the coast does not presently allow any actualisations of this indicator on a regular basis, as far as the surface coast-own habitat is concerned as well as for the coast-specific species. Long-running monitoring is necessary for these.

Graph **Number of coast own species and coast preferent Red List species within different taxonomical groups in relation to the total number of (Red List) species in Flanders**



Source Research Institute for Nature and Forest, Provoost & Bonte (2004)

5. REINFORCEMENT OF THE ECONOMIC TISSUE

- → ECONOMIC VALUE OF THE PORTS
- → RELOCATION OF ENTERPRISES
- → SURPLUS VALUE
- → EMPLOYMENT IN TOURISM
- → WAGE-EARNING EMPLOYMENT
- → UNEMPLOYMENT RATE
- → COMMERCIAL FISH STOCKS WITHIN SAFE REFERENCE VALUES*
- → PROSPERITY INDEX*

* These indicators are discussed in a different chapter .

REINFORCEMENT OF THE ECONOMIC TISSUE

5

→ WHERE DO WE WANT TO GO TO?

If a coastal zone wants to develop in a sustainable way, a diversified and stable economic structure with dynamic enterprises will be indispensable. In this type of economy, contributing to the prosperity of the region, large international companies as well as small self-employed businesses must have their place. The further exploitation of the region must happen in a balanced way, taking into account entrepreneurship as well as living and surrounding factors. Sufficient quality employment will create a positive climate. This will, in its turn, add to the general wellness.

→ WHERE DO WE STAND TODAY?

The coast is characterised by lively economic activity. Economic sectors like farming and fishing are historically interwoven with the coast. Industry and logistics are mainly concentrated in and around the ports of Zeebrugge and Ostend. Commerce and services, too, are well represented at the coast.

Agriculture and fishery are traditionally important economic sectors. At present they are under a lot of pressure. Over the last decades their importance has decreased sharply, to the benefit of commerce and services or the tertiary and quaternary sector[1] .

The presence of large economic gates such as seaports and airports bring a unique dynamics to the region. Of determining character are the distribution and logistics functions of the ports. Together with the port-related enterprises they do not only have a local but also a major sub regional effect. Next to the economic gates, the regional and local business sites also bring diversified economic activities and employment opportunities.

Despite the existing structures, the coast is characterised by a high degree of unemployment when compared to other regions. Many unskilled young people have problems to find a steady job. Season-bound employment, e.g. in the tourist sector, and a low industrial employment offer can partly explain this high unemployment rate. Often the vacancies offered are only temporary or temp-based jobs and a very high flexibility is demanded from the employees.

Another trend is that of qualified youngsters leaving the coastal region, because of a lack of quality employment opportunities. Paradoxically enough, business life in the coastal region signals the shortage of employable qualified labour force. There is obviously a mismatch between the bottleneck professions and skilled youngsters.

(1) The tertiary sector relates to commercial activities; the quaternary sector comprises administrative services and non profit sectors.

→ WHAT CAN WE DO?

The coast is characterised by a dynamic economic structure, mainly caused by the rather strong presence of the catering sector. **Projects that make it possible to create a higher degree of stability, such as season-enlarging and catering-supportive projects must be supported.** Innovative and future-directed projects will make the coastal region develop economically resiliently and will make it develop its possibilities to the full.

Because of the tourist economic interest and the close location of industrial sites at the regional level, business sites in the coastal region are limited to the urban zones, like Ostend, Veurne and Zeebrugge. **The restricted space for industrial sites in the coastal zone should form no obstacle for attracting local companies.** Supporting local crafts businesses creates a balanced economic structure and realises supplementary local employment.

In the further development of the port the opportunities for and the relations with the local and subregional economies must be considered. These chances can only be fully taken if, next to the economic aspects, spatial planning, environmental care and welfare are included in the strategic planning.

The high unemployment rate constitutes a special problem at the coast. To address this issue, the coastal municipalities can make use of their own exceptional character. The aging of the population creates opportunities for new employment. The rising care needs will indeed stimulate the care and wellness economy. However, in order for the care economy to function properly, collaboration with all actors involved in the sector will be an absolute necessity. The demand cannot only be filled in by retraining, but also by different approaches or a different work organisation in the social profit sector, with amongst other things specific attention for body care, child-care, day care or short-term residential care for elderly people.

Collaboration among authorities, business life and education can bring impetus for trained young people, to stay in the region or come to the region and thus make it stronger. Adjusted communication about assets or opportunities may improve the perception of the regional economy among young people, by means of which the attractive power of the coast will become bigger.

The growing urbanisation, the further development of tourist activities and nature development together contain the challenge to seek new forms of collaboration with the agricultural sector. Land consolidation and nature layout projects, farm tourism and landscape plans are already fine examples.

The government, too, can make efforts to help find sustainable solutions, such as linking dung processing to greenhouse cultivation. Practical research must show whether new functions for agriculture are in line with the expectations for the future, responding to evolutions in society and fitting within a possible conversion of the sector. Agricultural diversification in the polders (by collaborating with the tourist sector) with initiatives like farm tourism, congress and meeting facilities on the farm, an offer of team-building activities, ... opens up perspectives for the future.

The fishery sector, too, is clearly aware of its own issues, and must look for new chances. Sustainable fishery is only possible if all parties interested are working together.

ECONOMIC VALUE OF THE PORTS

TREND +/-

Author *Hannelore Maelfait (Coordination Centre for Integrated Coastal Zone Management)*

Lecturer *Paul Schroé (MBZ), Wout Dullaert (ITMMA), Bert Vernimmen (PSAHNN and ITMMA), Dirk Neyts (Secretariat Flemish Harbour commission)*

→ WHY THIS INDICATOR?

The seaport sector has evolved into a complete economic sector with its own dynamics. In addition to attracting petrochemical and chemical industry, present-day ports have an important function when it comes to logistics and distribution, too. The ports have an enormous direct and indirect industriousness: transport, transfer and storage, distribution, trade, services, industry, etc. Each of these activities generates employment and surplus value.

→ WHAT DOES THIS INDICATOR SAY?

The Flemish port landscape has four seaports: the coastal ports of Zeebrugge and Ostend, and Antwerp and Ghent inland. They are all very different ports, each of them bearing their own particular characteristics when it comes to their historical background, dimensions and speciality. Although they operate in an independent way commercially speaking and they have separate port authorities, they are strongly linked at the functional level.

The economic impact of the ports is amongst other things determined by the surplus value of the seaports for the national economy. These ports also generate direct and indirect employment, which can be noticed throughout the coastal zone. Ports and shipping trade are sectors facing extremely tight international competition, which will even increase further in the future. This growing competition is e.g. a consequence of the developments of the international market of goods traffic, the formation of international logistics networks and the scale increase in maritime transport. If the importance of the Flemish ports is considered, it is necessary to see them within a larger context.

→ WHAT ARE THE RESULTS?

The market share of the Flemish ports in the Le Havre-Hamburg range must be situated between 23.5% and 23.9% since 2001. In 2006 the market share of the Westflemish ports of Ostend and Zeebrugge in the Le Havre-Hamburg range relating to maritime traffic amounted respectively to 0.8% and 3.9%. Antwerp and Ghent have figures of respectively 16.6 % and 2.4 %.

In 2006 the port of Zeebrugge handled a total volume of 39.5 million tonnes. This is a growth of more than 14.1 % when compared to 2005. Thus, Zeebrugge was one of the strongest growers within the Le Havre-Hamburg range. This must mainly be attributed to increasing container traffic. For the fourth consecutive year the volume of containers exceeds that of roro traffic.

The Ostend port presents itself as a roro port. During the nineties the port was struggling with a downfall in traffic figures by the combined effect of the RMT (the Belgian Marine Administration) falling away and the competitive pressure of the Chunnel. This tide has changed, however. Since 1999 the port of Ostend has each year been able to deliver figures of growth. In 2006, too, the handled tonnage increased in this port, with a figure of 1.7% vis-à-vis 2005. This increase is for the greater part the result of an increase in roro traffic.

The economic impact of these ports is amongst other things determined by the surplus value the seaports bring to the national economy. In the port of Zeebrugge the total surplus value rose from 520.40 million EUR in 1997 to 799.60 million EUR in 2005 (+53.6 %) or averagely 5.5 % per year. Ostend had an enormous growth of +87.1 % or from 223.70 million EUR to 418.7 million EUR in the period 1997-2005. In Zeebrugge, this growth is to be situated mainly among shipping agents, expeditors and goods handlers and less with the shipping companies and with trade. In Ostend this growth is mainly situated in growth of the industry.

The presence of the ports creates direct as well as indirect employment. Ostend and Zeebrugge had an employment rate of respectively 10.658 FTE (+ 10 % cfr. 1997) and 4.550 FTE in 2005 (-6,7 % cfr. 1997), in which FTE refers to full-time equivalents.

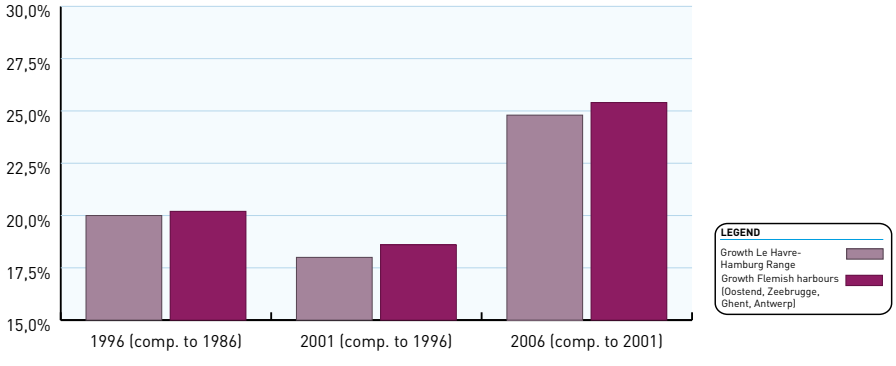
Both ports are important for Short Sea Shipping (SSS), in which transport via coastal navigation is used as an alternative for road transport. Zeebrugge transported 28 million tonnes via SSS in 2006, which is nearly 18 million tonnes more than in 1983. In Ostend the entire shipping transport can be described as SSS.

→ WHAT ABOUT THE FUTURE?

The economic value of the seaports says little about the sustainable ways in which a port can function. The challenge here, next to the further economic development, is to also keep account of a number of ecological and social aspects. Attention goes to the development, e.g. of sustainable mobility, not only by the further development of short sea shipping but also by improving the multimodal hinterland openings and transfer facilities. With respect to air pollution, too, supplementary international measures in the field of shipping trade emissions have resulted in an improvement of the living environment around the ports. Together with such things as the new toll obligations for shipping waste and cargo residues in ports, these developments will lead to a more sustainable shipping trade with respect for the ecological as well as economic development of the port.

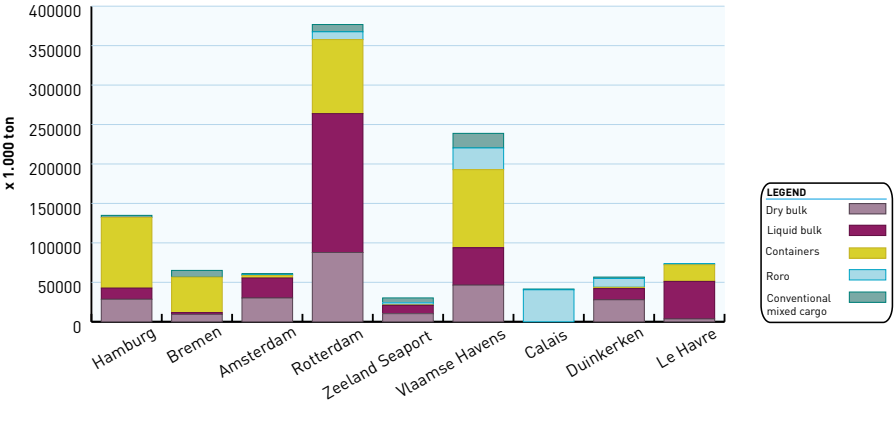
Seaports function as gates to the rest of the world. In this way they constitute a major source of prosperity. The market share of the Westflemish ports of Ostend and Zeebrugge in the Le Havre – Hamburg range with reference to maritime traffic in 2006 amounted to 0.8 % and 3.9 % respectively. Much more than in the past the principal challenge for the seaports lies in the development of sustainable mobility.

Graph 1 **Average growth of the Flemish harbours compared to the growth of the growth of the Hamburg-Le Havre Range**



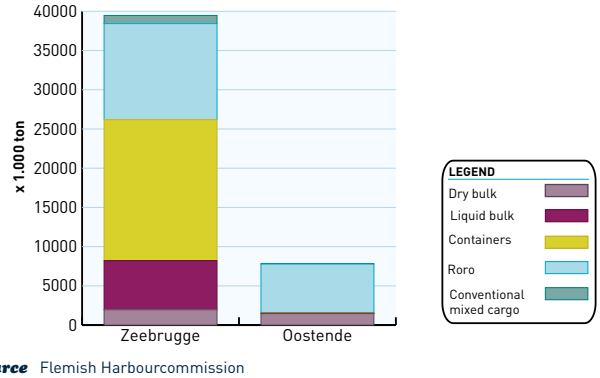
Source Flemish Harbourcommission

Graph 2 **Maritime transfer in Le Havre-Hamburg Range, 2006**



Source Flemish Harbourcommission

Graph 3 **Maritime transfer in Zeebrugge and Oostend, 2006**



Source Flemish Harbourcommission

UNEMPLOYMENT RATE

TREND +/-

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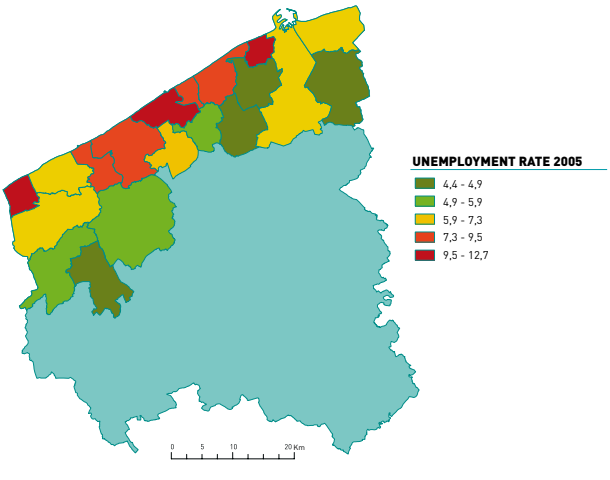
Lecturer *Ronny Misplon*
(VDAB)

The unemployment degree is higher in the coastal municipalities than in the hinterland, respectively 8.9 and 5.5 percent in 2005. In 2003 the unemployment degree only amounted to 8.3 and 5.0 percent in both regions. The number of non-working jobseekers decreased in 2007, however. In the period 2005-2007 the unemployment degree did not only increase at the coast, but throughout West Flanders. So, the growing unemployment degree is not only an issue for the coastal region but must be tackled large-scale, although this does not exclude regional actions. The unemployment issue of the coastal municipalities clearly distinguishes itself from that of the other Westflemish municipalities. At the same time the coast has a number of specific opportunities to help jobseekers find work.

Map **Unemployment rate, 2005**



Source Centre WSE, processed by Centre Social Planning - Province of West Flanders

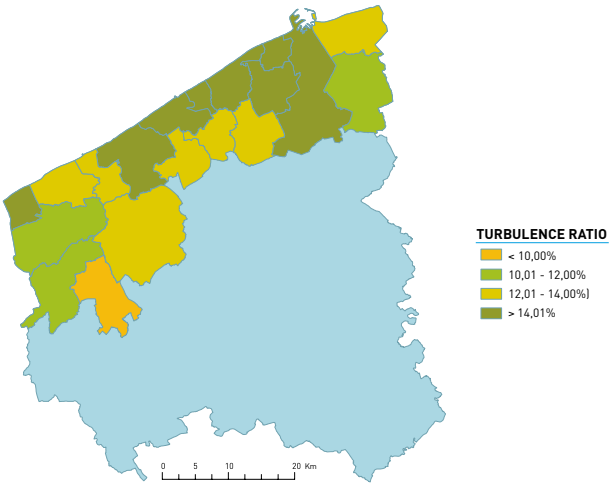
PROGRESS OF BUSINESS

TREND +/-

Author *Nele Depestel*
(Service Economy - Province of West Flanders)
Lecturer *Miguel Meuleman*
(Vlerick Leuven Ghent Management School)

The economic life at the coast is characterised by a high turbulence. The number of establishments, closing-downs and bankruptcies of businesses as compared to the number of active enterprises is much higher at the coast than in West Flanders. In the hinterland the economic dynamics is much smaller than at the coast, which can largely be attributed to the different nature of the activities at the coast and in the hinterland.

Map **The turbulence ratio, 2005**



Source FPS Economy, SME's, independent Professions and Energy, processed by Service Economy - Province of West Flanders

ADDED VALUE

TREND +/-

Author *Nele Depestel*
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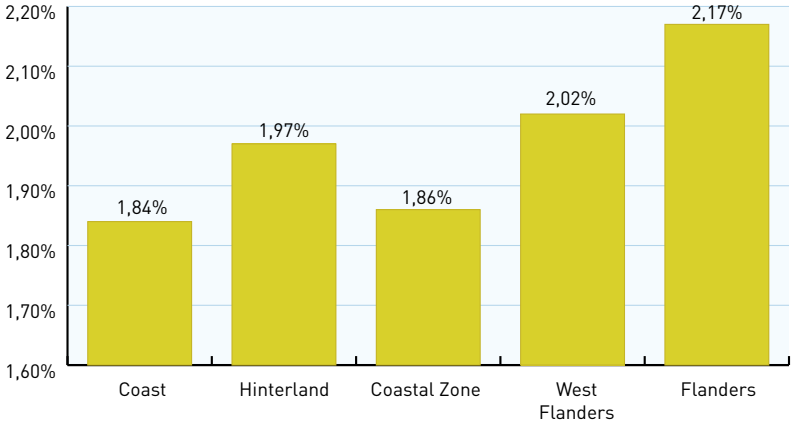
Lecturer *Koen Debacker*
(OECD)

In the period 1996 – 2005 the gross surplus value did not rise as quickly at the coast and throughout the West Flanders hinterland. The entire coastal zone holds good for at least one third of the surplus value created in West Flanders. Because of the regional towns of Bruges and Ostend the ten coastal municipalities taken together have a substantially bigger share in the Westflemish surplus value than the nine hinterland municipalities.

Graph ***The average annual economical growth, 1996-2005***



Source NBB, processed by Service Economy - Province of West Flanders

EMPLOYMENT IN TOURISM

TREND +/-

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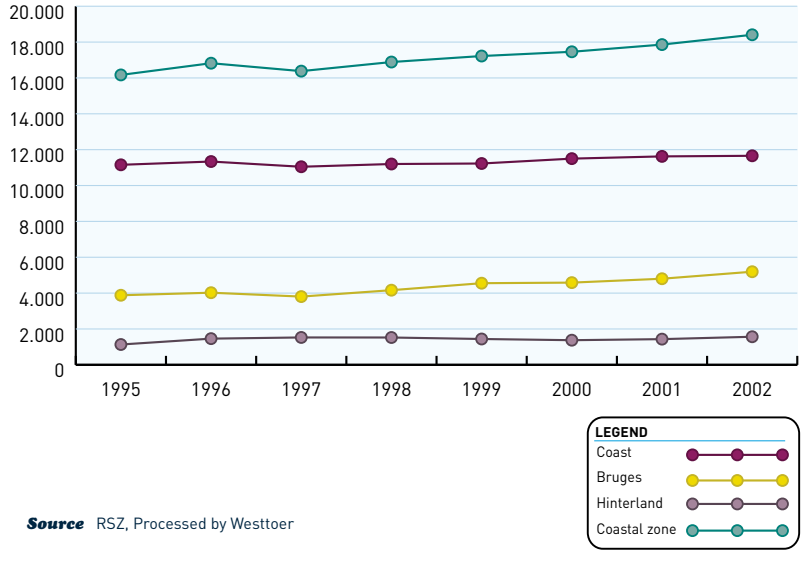
Lecturer *Steven Valcke*
(Tourism Flanders)
Peter Cabus
(Research Centre for Tourism and Recreation)

The tourist-recreational sector is of vital importance for the economy and the employment in the coastal region. Since 1995, employment in the tourist sector has grown with 13.8% or roughly 2,200 jobs. In that same period there has been a relative rise of employment in the coastal municipalities with 4.5 %.

Graph **Evolution of the total employment in tourism and recreation, 1995-2002**



Source RSZ, Processed by Westtoer

WAGE-EARNING EMPLOYMENT

TREND +

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Lecturer Koen Debacker
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At the end of 2004 the coastal zone had 132,805 wage-earning employees. They represented 34.8 percent of the Westflemish total. As compared to the middle of 1998 wage-earning employment in the coastal zone has risen with 7.1 percent. In West Flanders the increase amounted to only 5.4 percent. The coastal zone is characterised by a weak industrial basis. The share of industry in wage-earning employment amounts to only 9.8 percent at the coast and to 17.5 percent in the hinterland.

Graph **Evolution of the wage-earning employment per sector, 30 june 1998 - 31 december 2004**

Source NBB, Processed by Service for Economy - Province of West Flanders


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Initiatieven als impuls v
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6. GOVERNMENTAL INNOVATION

→ EFFORTS OF INTEGRATED COASTAL ZONE MANAGEMENT

GOVERNMENTAL INNOVATION

6

→ WHAT ARE WE AIMING FOR?

Consulting, looking for solutions together, fine-tuning: these are terms that occur in many (policy) plans for the future. All of them hold good for the coast, too. **Integrated and sustainable management of the coast demands a new approach of government, leaving behind sectoral thinking.** A comparative assessment must be made on the basis of sustainability principles, with attention to economic, ecological and social concerns. This method is already applied in structural planning or ETS procedures. It is not an easy task, though, as the management structures and legislative instruments have always been sector wise organised and a cross-sector reorganisation requires a lot of time.

The most likely feasible innovation at the managerial level is that all services involved at the coast make themselves familiar with this integrated method and apply it. In order for integrated thinking and acting to become possible, these services will in term have to adapt themselves at the organisational level, too. Evolving towards a new way of working is a continuous process, in which evaluation and making adjustments are crucial. Fine-tuning among the different players will be obtained by organising structured consultation.

Other important focuses of attention in innovation are: the involvement of relevant coastal actors, the delineation of a long-term strategy for the coast and an optimal fine-tuning and combination of the available tools. The eventual goal is a sustainable coastal management.

→ WHERE DO WE STAND TODAY?

At the coast a big number of administrative borders are crossed. The federal and Flemish authorities realised as early as 15 years ago that the coast has to deal with complex policy issues. That is why special attention has been given to cross-sector consultation for the coast since the beginning of the 1990s. The setting up of an intercabinet steering group with an official task group (1994), the signing of a collaboration agreement for the coastguard (2006) and the signing of a protocol for integrated sustainable coastal zone management (2007) are all illustrations of this, next to the implementation of various integrated projects.

The Province likewise plays a prominent role, from its decree commission to work operationally-directed to offering support to the Coordination Centre for Integrated Coastal Zone Management. **Through different initiatives and projects it is attempted to actively involve municipalities and to draw attention to the importance of integrated management.**

The Belgian approach is unique in Europe. A number of steps are clearly taken to handle coastal management in an innovative way. The project wise approach is gradually broadened to a more structural method, in order to steer the development of coast and sea into a positive direction. That is why the integrated approach has been taken up in the mission of different administrations that signed an agreement in principle with respect to sustainable coastal management. This approach has also entered sectoral plans as well as research and academic programmes.

→ WHAT CAN WE DO?

Governmental innovation for sustainable coastal management remains far and difficult to find. Which innovated administrative structure can handle the complex challenges? How can integration be the objective, if there is no large-scale reform of all existing structures and instruments?

Governmental, administrative and legal integration demand an approach in different fields at the same time, with actions at different governmental levels. Legally and instrumentally the links between available and new tools must be reinforced. At the managerial level a structured and efficient consultation, in an open spirit, can lead to solutions. The road to be taken will remain a learning process, anyway. A concrete, action-directed fine-tuning of sectoral policies can help pave the road towards integration. The first step is a testable integrated approach within the sectors. Continuous evaluation is necessary in this. Consecutively, a formal, institutional framework must structure the consultation and coordination (1). In order to make progress, an administrative bearing surface (political and official) as well as financial support will be necessary.

The specific coastal problems cluster occurs in the zone where land and sea meet. For the problems that were mapped out earlier, the competent authorities will have to seek feasible solutions in a constructive manner.

Moreover, the management of the sea will always ask for more attention. The demand for new developments at sea will grow with the occurrence of new technological options and with the increase of conflicts about the ever more scarce space on land. A long-term policy can and must be developed.

Integrated management also presupposes a change of mentality and behaviour in all coastal actors. Stimulating exemplary projects can have a multiplying effect. This is what the 'Duurzaam Kustproject' awards *(awards for sustainable coastal projects)* **(www.dekustkijktverder.be)** try to achieve. In 2006 these awards were presented by the Coordination Centre for Integrated Coastal Zone Management for the first time. Moreover, public-private collaboration and increased involvement and responsibility of the private sector are desired. In that way local governments can e.g. be more involved in integrated management by setting up a coastal forum of actors. They form the key to stimulating integrated management, not only among citizens and companies, but also within their own services. In this way all coastal actors are able to take the step towards a better integrated approach of the coast. **Activating the dedication and involvement of the local authorities at the coast remains a challenge for the future.**

Caring for the sea and the coast does not stop at the national borders, however. In order to arrive at a fine-tuning of policies and exchange of experience international collaboration is necessary.

During the past years the attention for the coast and the sea has gained momentum. A large number of solutions are, however, still informally and unstably based, the reason why guarantees for success are still lacking. Ratified instruments, supported by political will and political decisions, can further shape governmental innovation.

Reference

(1) Achtergrond # 03 - architect / Ontwerper / Onderzoeker? Casus Mare Meum: een oefening op de zee, Cahier Vlaams Architectuur Instituut, Brussel, 2007.

EFFORTS INTEGRATED COASTAL ZONE MANAGEMENT

TREND

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Lecturer *Dirk Bogaert*
(Maritiem Institute Ghent University)

→ WHY THIS INDICATOR?

A good policy, directed at long-term solutions, requires an integrated approach, in which sectors and authorities at the local, regional, national and international level work together. This indicator measures the degree of implementation of Integrated Coastal Zone Management by the authorities. It is called the progress indicator.

It is a general method, elaborated at the European level, which makes a comparison with other European countries possible.

→ WHAT DOES THIS INDICATOR SAY?

The progress indicator measures the degree to which the process of integrated management of coastal areas (ICZM) has been implemented. This cyclical process comprises four different phases:

Phase 1: Planning and management have their place in the coastal zone;
Phase 2: There is a framework within which ICZM can be implemented;
Phase 3: Most aspects of the ICZM approach are present and are functioning fairly well;
Phase 4: An efficient, accommodated and integrated process is embedded in all levels of authority and will realise a greater sustainability of the coast.

Each of the phases is described by means of a number of prepositions typifying the integrated process (see technical chart for further details). These phases are assessed by a group of involved people. At present, the results can only be based upon one singular measurement in November 2005, in which 28 people were involved. It is advisable to repeat this test at least every two years in order to arrive at a workable result for this indicator.

The better the integration, the more positive answers will appear in phases 3 and 4 of the ICZM process cycle. Complete integration is reached at the moment that all actions are given a positive score.

→ WHAT ARE THE RESULTS?

The measuring has resulted in a number of usable conclusions. All participants are of the opinion that effective planning and management is done in the coastal zone. To this end, several instruments are available, such as legislation, structural plans, consultation forums, monitoring programmes and protection statutes. It must be remarked though, that we are not discussing integrated planning and management here.

Most participants are of the opinion that different elements are present to create a framework for sustainable management of the coast. Ad-hoc actions, inventory of problems and the start of specific guiding lines for the coast are positively assessed examples.

Although aspects for sustainable coastal zone management are already present, the functioning of the process is still below standard. According to the participants, the problems are situated in the involvement of coastal actors, in an open communication from those responsible, in the implementation of good plans, but also and especially in the statute of drawn up plans and strategies.

Over half of the people involved are of the opinion that sufficient budget and the lack of any official consultative structure remain a problem.

The fourth phase in the process probes the embedding of an integrated process at all policy levels. It was obvious from the test that especially in this matter improvements are to be made. As concerns the collaboration across the coastal and marine borders, this phase had a good score. The same holds good for the accessibility of quality information needed to take timely, coherent and sound decisions.

→ WHAT ABOUT THE FUTURE?

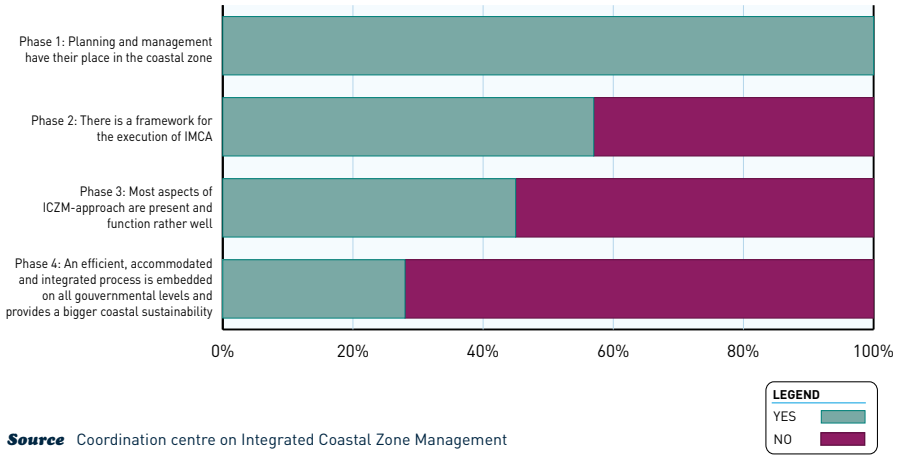
One of the principal items of amelioration quoted during the test is the necessity of constant political support for the ICZM process. The establishment of an ICZM steering group can form an answer to this, on the condition that all members of the steering group also effectively commit themselves to openly and constructively discussing the coastal files.

The further elaboration of monitoring and evaluation instruments, such as EIS procedures and structural plans, also form a point of attention. Today, however, a structured evaluation and adjusting mechanisms are not at all operational yet. Establishing these mechanisms to review and evaluate the implementation progress of ICZM is really necessary. Fortunately, positive trends are clearly noticeable, for instance by inscribing monitoring obligations in permits.

The implementation of ICZM never stops. Between 2005 and today, positive evolutions can be seen, such as the token of political involvement at different levels by the signing of the agreement in principle regarding ICZM.

Integrated coastal zone management is an on-going process. In order to produce results, a governmental platform and an administrative one are necessary. Two prior conditions for success are involving all relevant coastal actors and adjusting planning and legislative instruments towards an integrated approach.

Graph **Perception of implementation degree of sustainable coastal zone management, 2005**



Source Coordination centre on Integrated Coastal Zone Management

7. COASTAL DEFENCE AND CLIMATE CHANGE

- → SEA LEVEL RISE
- → NUMBER OF DAYS WITH WINDVELOCITY ABOVE 7 BEAUFORT
- → SAND SUPPLETION QUANTITY

COASTAL DEFENCE AND CLIMATE CHANGE

7

→ WHERE DO WE WANT TO GO TO?

A robust coastal defence must guarantee the safety of the coastal communities and protect the hinterland against the violence of very heavy storms. An adequate protection of the entire coastline must limit the chance of floods from the sea to a minimum. A safe coast forms the basis for sustainable development, in which nature, economy and recreation must find their place. Without sufficient protection of the population and the patrimony, sustainable development is not possible.

→ WHERE DO WE STAND TODAY?

The coast used to be protected by dikes. These form a hard and static sea defence that breaks the natural dynamics of a sandy coast. Since the 1960's no new sea embankments have been built, though. To further protect the coast, mainly soft dynamic techniques have been chosen. A structural elevation and reinforcement of the seawall is possible by e.g. bringing sand to the beach and the front bank. These are measures that are far less complex and far more flexible than adjusting the sea embankments.

Today the coastline is less well protected against storms that statistically appear once every hundred years. A storm of this kind comes with waves with a height up to 4.80 m and a rise of the water level to 6.40 m TAW (this is a level that is 1.70 m above the average spring tide). Large parts of the coast have a higher level of protection. These are often the zones that are protected by the natural sea defence, a beach and a dunes belt. On a wide beach where the depth of the seabed gradually decreases, the force of the heaviest storm waves is broken. A beach thus not only catches up the violence of the waves, but also adds to the attractiveness of the coast. This type of coast defence can also grow along with the sea, which is important with a view to the estimated rise of the sea level. For the future, there is the objective to arrive at a full protection of the coast against a millennium storm.

In Flanders about 15 % of the surface is less than 5 metres above the average sea level, especially the coastal zone and the polders of the River Scheldt. This makes the coastal zone vulnerable. Climate changes and the expected sea level rise can have far-reaching and irreversible consequences for social, economic as well as ecological systems. The coastal zone may thus be confronted with a growing risk of flooding and even of a direct loss of land. Next to that, there are also indirect consequences, such as stronger erosion, seeping of saltwater into groundwater winnings and disrupted functioning of sewage systems in towns along the coast. On top of all that, the economic activities along the coast and the habitation of coastal zones will come under pressure.

→ WHAT CAN WE DO?

By 2100 the sea level will by estimation rise by 60 cm. At the same time, the North Sea coast will more often be facing heavy storms. Restoration of the natural sea defence is an absolute priority. Where this is possible, soft measures will be chosen, such as sand suppletions supporting the natural dynamics of a sandy coast.

The systematic approach of the coastal defence is continued under the scope of the current coast safety plan in order to take the entire coastline in term to a very high safety level against flooding. The evolution of the coast must be closely followed up on. Techniques like teledetection measure the erosion and the increase of beach and front bank meticulously. They allow a continuous follow-up on the safety level. This monitoring indicates where interventions are necessary, especially if large parts of the natural sea defence are damaged after a heavy storm.

An integrated approach of coastal defence is needed in order to guarantee safety against the wild force of the sea. But the further development of this coastal defence in equilibrium with the ecological and recreational values of the coastal zone is an important balancing exercise.

SEA LEVEL RISE

TREND

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→ WHY THIS INDICATOR?

The sea level is influenced by several different factors, e.g. by changes in the climate, which make the sea-level rise. Constructing and maintaining a sufficiently high and strong sea defence forms the basis to defend the coast against the rising water. Along our coast the dunes form the natural sea defence. In seaside resorts and ports this natural sea defence has been replaced by constructions such as sea embankments and quay walls. The level of the sea measured in comparison to the current land level is the so-called relative sea level. The height of the relative sea level is a decisive factor in the assessment of flooding risks.

→ WHAT DOES THIS INDICATOR SAY?

The Flemish Hydrography service has been measuring the evolution of the sea level for nearly 200 years. This is done by tidal measurements by means of special measuring instruments, called 'maregraphs'. A maregraph measures the relative change of the sea level as compared to constructions that form part of the sea defence in the ports, such as quay walls. The measured values are filtered and processed into an average value for the relative sea level, representative for a particular year.

→ WHAT ARE THE RESULTS?

The relative sea level varies constantly because of a range of physical processes, such as waves, low and high tide, plates tectonic, the corner of the sun with the equator, spring tide, slack water or neap tide, increase of the volume of ocean water, ... The many different processes with their own time and spatial scales and sizes are working simultaneously and across each other and together determine the eventual measured sea level.

From the analysis of the maregraph* data in Ostend, the highwater level appears to know a rising trend of 2 millimetres per year over the last 70 years. The average seawater level and low water level, too, have respectively increased by 1.5 and 1 millimetre per year. These three rises have all been put out in a relative way vis-à-vis the mainland. As yet, no acceleration of this rise has been recorded. An acceleration of this type, if it is small, is not easily detectable. For there are quite a number of variables responsible for the fact that the evolution of the yearly average relative seawater level cannot be represented by a flowing curve. That is why trends in the short term, for example over 10 years, are quite difficult to detect.

The Intergovernmental Panel on Climate Change (IPCC) has mapped out that the sea level rise in the 20th century had an average of 1 to 2 mm per year. These conclusions are based upon worldwide measurements by means of maregraphs and therefore correspond to the observations made by the Flemish Hydrography.

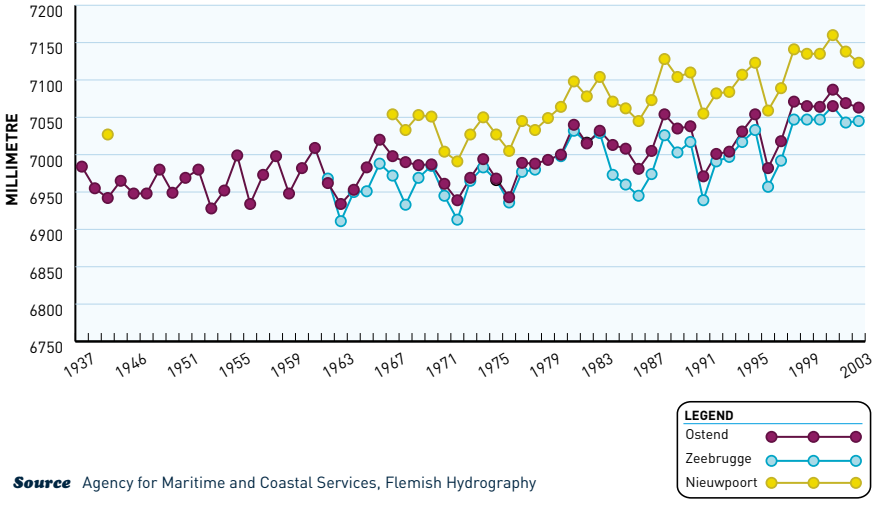
→ WHAT ABOUT THE FUTURE?

The extent to which the relative sea level rise will continue in the 21st century will have important consequences for the coastal defence. A rising sea level entails a larger water depth, which makes the waves in the coastal zone become bigger. The energy of the gulfs surging against the coast will decrease less. This will have a bigger gulf impact. Because of this, the Flemish Region provides in the compensation of a sea level rise by structurally elevating and reinforcing the coastal defence. This will be implemented by means of sand suppletions at the coast and at the front bank amongst other measures.

* Toon Verwaest et al. De Zeespiegelstijging meten, begrijpen en afblokken - De Grote Rede, nummer 15, december 2005 - samengevat door Guido Dumon (Vlaamse Hydrografie)

The sea level changes under the impact of global warming. Research has shown that the sea level has risen with a speed of 2 millimetres a year over the past century. The evolution is closely watched year upon year. Next to this yearly follow-up on the evolution, it is also important to take the necessary measures to reinforce the sea defence and to diminish the flooding risks.

Graph **Sea level rise for the three measuring stations at the Belgian Coast, 1937-2003**



Source Agency for Maritime and Coastal Services, Flemish Hydrography

NUMBER OF DAYS WITH WINDVELOCITY ABOVE 7 BEAUFORT

TREND +/-

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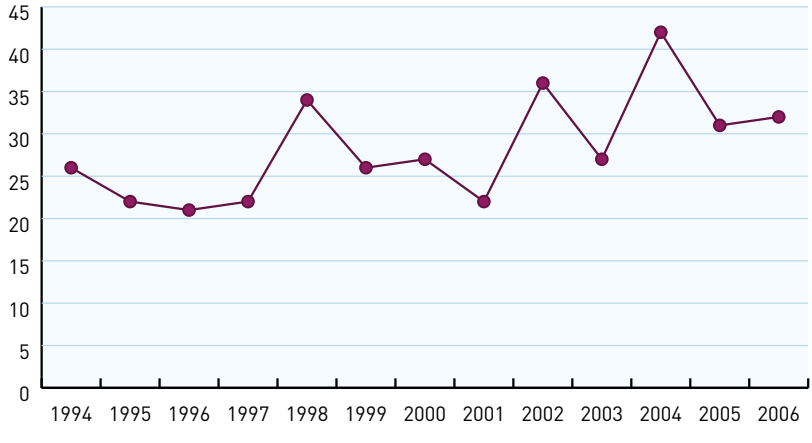
Lecturer *Jaak Monbaliu*
(Hydraulics Laboratory Leuven University)

A possible effect of climate change, next to the change of the sea level is a temperature change of the atmosphere and of the seawater. These are two factors that may trigger weather changes. Storms are especially important when it comes to coastal safety. On average there are 14 days with a wind speed above 7 Beaufort per year over the period 1994-2006. Following up on storm conditions, in combination with the data of sea level rise and a detailed analysis of the floodable areas is important.

Graph **Evolution of days of wind speed above 7 Beaufort, 1994-2006 (location meteopark Zeebrugge)**



Source Agency for Maritime and Coastal Services, Flemish Hydrography

SAND SUPPLETION QUANTITY

TREND +/-

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Lecturer *Peter Troch - Julien De Rouck*
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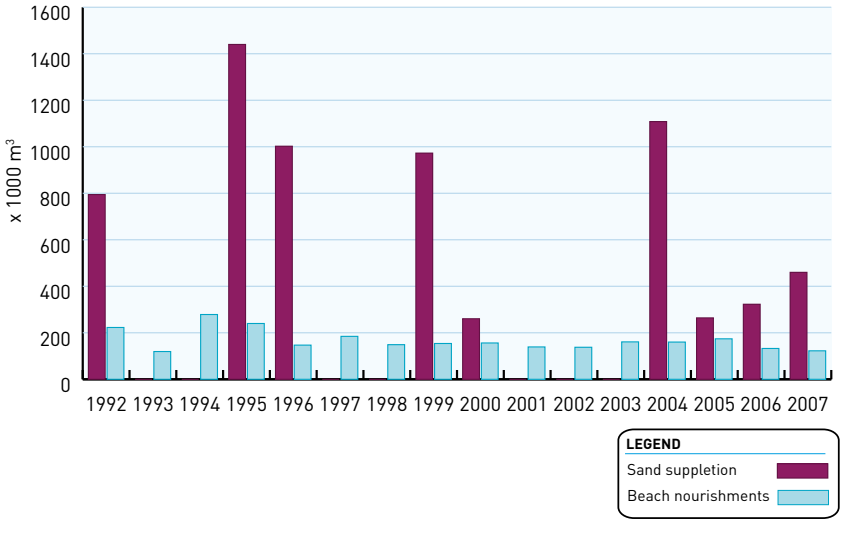
Large-scale sand suppletions, carried out to bring weak spots in the sea defence to the desired safety level by means of one large-scale intervention, are not necessarily taking place every year. During the last four years some beach suppletions have been carried out and maintained, e.g. in Ostend and Knokke-Heist. Bathing beach elevations, intended to combat erosion on a local scale, are carried out with more or less constant yearly sand volumes. They are important for the maintenance of recreational beaches during the bathing season.

Graph **Evolution of annual volume of sand transported for beach nourishments and sandsuppletion, 1992-2007**



Bron Agency for Maritime and Coastal Services, Coastal Division

The Coastal Compass

The future of the indicators and the coast

→ WHAT ABOUT THE FUTURE OF THE INDICATORS?

This Coastal Compass is the result of a collaboration of about 50 scientists, who were either the author or the lecturer of one or more of the texts. The extensive process that has preceded this new edition of the Coastal Compass has again turned out to be an instructive experience. The experts who have offered their cooperation exchanged opinions about the different themes, which in turn stirred up the discussion again. From the many contacts with the authors and lecturers it was clear that the themes discussed per indicator are very much alive. An evaluation of the list of indicators from the first Coastal Compass has shown that not all of them were equally appropriate. In the second edition of the Coastal Compass some definitions have been modified and certain indicators have even been replaced. Sure enough, a sustainability barometer is not a static instrument. It is intended to measure the sustainable development of a dynamic environment and cannot do this without undergoing a number of modifications itself.

Indicators for sustainable coast development show trends and phenomena. Those can be linked to strategic visions on the sustainable development of the coastal area, in which all actors involved (the government, private parties, NGOs, ...) can find each other. By coming as closely as possible to the policy pursued, the indicators can serve a lot better as policy supporting instruments. They help when focussing on the coast, if they are constantly drawn to the attention of a wide group in an active way.

→ WHAT ABOUT THE FUTURE OF THE COAST?

The coast is unique and must keep its uniqueness. Although much attention is devoted to the coast in many plans, there is no separate vision or strategy for the coast. The challenge exists in fine-tuning the large number of different visions and plans, small-scale as well as large-scale, and thus to work together on a more sustainable policy for the coast. This should happen through consultation and collaboration, in a future-oriented search for long-term solutions, which will be acceptable for everyone.

The ultimate joint objective is the sustainable development of the coast. Because we want numerous future generations to be able to enjoy the coast and its sea of opportunities...

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