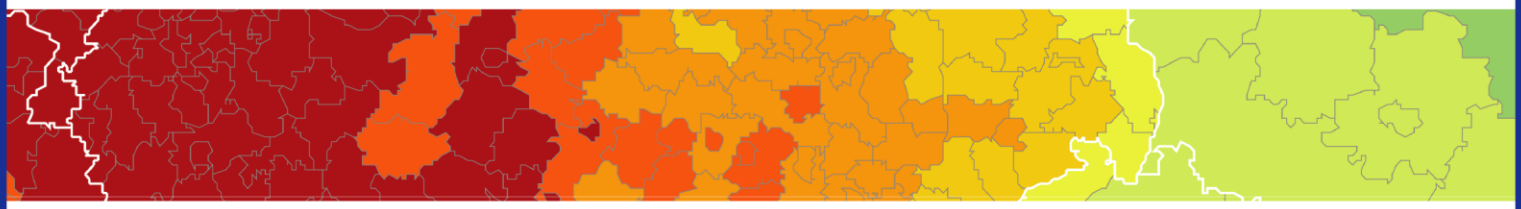

ESPON QoL – Quality of Life Measurements and Methodology

Annex 12 to the Final Report

Case study: Netherlands

Applied Research

Final Report

30th October 2020

Final Report

This applied research activity is conducted within the framework of the ESPON 2020 Cooperation Programme.

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Annex 12 to the Final Report

Case Study 09:

The Netherlands

ESPON QoL – Quality of Life
Measurements and Methodology

30th October 2020

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The final version of the report will be published as soon as approved.

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Abbreviations

RQI	Regional Quality of Living Index
QoL	Quality of Life
TQoL	Territorial Quality of Life

Introduction

This is one of the 10 case studies of the ESPON study “Quality of Life Measurements and Methodology”. The purpose and results of the study, including the definition and application of a territorial quality of life measurement methodology, the synthesis of all case study findings, targeted policy recommendations, ideas for fostering cooperation between ESPON, EUROSTAT, OECD and the UN and recommendations for further research, are illustrated in the Final Report, to which this case study report is annexed.

The purpose of the case studies is twofold:

A) to collect good practices that can be adopted in other European regions, and

B) to make use of the methodology developed and allow for adjustments through testing in case studies.

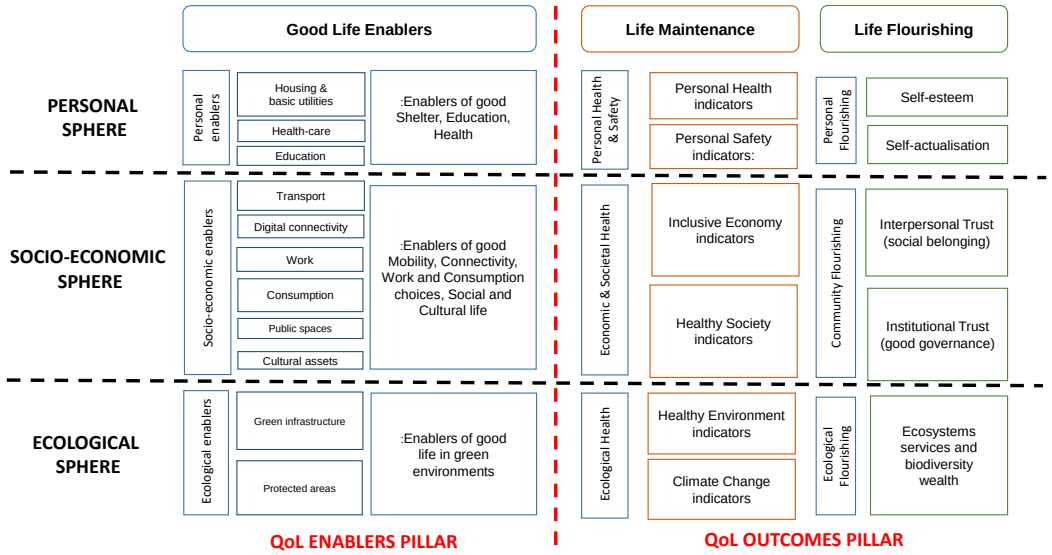
Each case study provides examples of application of the concept of quality of life (QoL) in a specific region. This complements the conceptual model and the research done at European level. The reasons why this region has been chosen forms part of Section 1.

For objective A) the case study report explores the policy context, in which QoL is used and measured in the region (Section 2). It is important to understand for which purpose the concept has been established, in which policy fields it is being used, how different levels of government are involved and which success factors and obstacles can be identified. Section 3 explains the indicators, measurement methods and data that are used for measuring QoL.

Objective B) is covered in Section 4. The study defines and tests a methodology to measure QoL at territorial (sub-national) level and offers guidance to policy makers at different levels – local, regional, national, European – on how to integrate QoL in policy processes and in territorial development strategies. We have applied to the case studies the methodology developed in the main report. This includes the Territorial Quality of Life (TQoL) measurement system and the system for coding indicators.

The TQoL framework defines the system and its main elements (pillars, spheres, sub-domains) to measure QoL facets with reference to territorial entities identified. This is shown in the TQoL framework in figure 1 below.

Figure 1 The TQoL framework



The system for **coding indicators** to represent and monitor adequately the different QoL domains, defined in the TQoL framework, is illustrated in Table 1 below.

Table 1 Coding of the indicator system in the TQoL framework

Dimension	Domain	Sub-domain	Definition
Good Life Enablers	Personal enablers	Housing & basic utilities	
		Health	
		Education	
	Socioeconomic enablers	Transport	
		ICT connectivity	
		Work opportunities	
		Consumption opportunities	
		Public spaces	
		Cultural Assets	
	Ecological enablers	Green infrastructure	
		Protected areas	
Life Maintenance	Personal Health and Safety	Personal health indicators	
		Personal safety indicators	
	Economic and Societal Health	Inclusive economy indicators	
		Healthy Society indicators	
	Ecological Health	Healthy Environment indicators	
		Climate change indicators	
Life Flourishing	Personal Flourishing	Self-esteem	
		Self-actualization	
	Community Flourishing	Interpersonal Trust (Social Belonging)	
		Institutional Trust (good governance)	
	Ecological Flourishing	Ecosystems services and biodiversity wealth	

Both, the TQoL framework and the coding system are applied in all case studies (Sections 4.1 and 4.2).

The methodology developed in this report includes further elements - a dashboard, the latent clustering approach and the citizen-centric approach - that are applied in the case studies, if sufficient data or information have been available. These elements are as follows:

- The indicators coded for local or sub-regional territorial units are presented in a **dashboard** (in an Excel-based tool). In the dashboard different points in time or objective and subjective indicators can be included and compared at territorial unit level. The specific indicators used to monitor the QoL domains are different in each case, as they take into account specific local circumstances that influence the selection of indicators (e.g. availability of data, local priorities and practices).
- In the case studies that cover a large number of territorial units the **Latent Class clustering model** helps to analyse underlying patterns and spatial differences of territorial QoL. However, the number of case studies falling in this category is small.
- A descriptive element of the TQoL approach identified in this applied-research project is the **"citizen-centric" approach**, where citizens are engaged in co-design, implementation and fact-checking activities ("factfulness" tests), to make the measurement of territorial QoL more responsive to the needs and aspirations of citizens to improve their everyday life. This can be promoted, recommended, and applied within the different case study contexts highlighting in particular any existing local practice of citizen engagement that could be adopted as a concrete example of the approach.

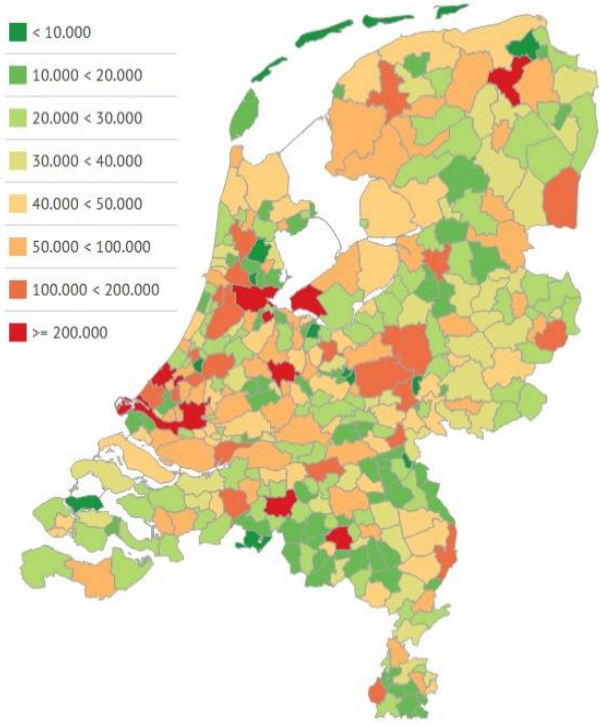
These methodological elements are considered in the case studies which were carried out to investigate and compare noteworthy experiences of territorial QoL measurements against the TQoL framework that has been developed with the aim of drawing lessons for further adjusting and fine tuning the methodology, which will eventually allow for its practical and widespread use for measuring QoL across territories in Europe.

1 Description of the region

1.1 Characteristics of the case study

The Netherlands literally means 'lower countries', which refers to its low elevation and flat topography. Only 50% of its land exceeds one metre above sea level and there a no mountains (the highest point is around 300 meters). With a population of 17.34 million people, all living within a land area of 33,700 sq. km, the Netherlands is one of the most densely populated countries in the world. Within the Netherlands, an area known as the Randstad in the west, anchored by the cities of Amsterdam, Rotterdam, The Hague, and Utrecht, is the most densely populated region; the north, south and east tend to be less dense, though sizeable communities can be found throughout the entire country (see Figure 2).

Figure 2 Number of inhabitants of the 355 LAU2 regions in the Netherlands



Source: Statistics Netherlands, 2020

The Netherlands has the sixth-largest economy in the European Union and plays an important role as a European transportation hub, with a consistently high trade surplus, stable industrial relations, and low unemployment. Industry focuses on food processing, chemicals, petroleum refining, and electrical machinery.

The country consists of 4 NUTS 1 regions, 12 NUTS 2 regions (the provinces) and 40 NUTS 3 regions. As of January 2019, there are 355 Local Administrative Units at the 2nd level (LAU2), the municipalities.

1.2 Rationale for selecting the case study

The specific reason for selecting The Netherlands as a case to be examined by the ESPON QoL project is, that it allows studying quality of life in relation to three relevant structural characteristics, namely (1) the size of the LAU2 region (e.g. in terms of the number of

inhabitants) (2) the status of the region in terms of the (expected) growth or decline of the population and (3) the (expected) aging of the population (which is correlated with growth/decline of the population).

With respect, the first characteristic, assessing how the size of a region affects its Quality of Life may yield policy-relevant information. For example, it may be expected that larger regions are more attractive from an economic perspective, as they offer more opportunities in terms of jobs and access to services. Yet, larger (urban) regions may perform less well in terms of social and environmental indicators.

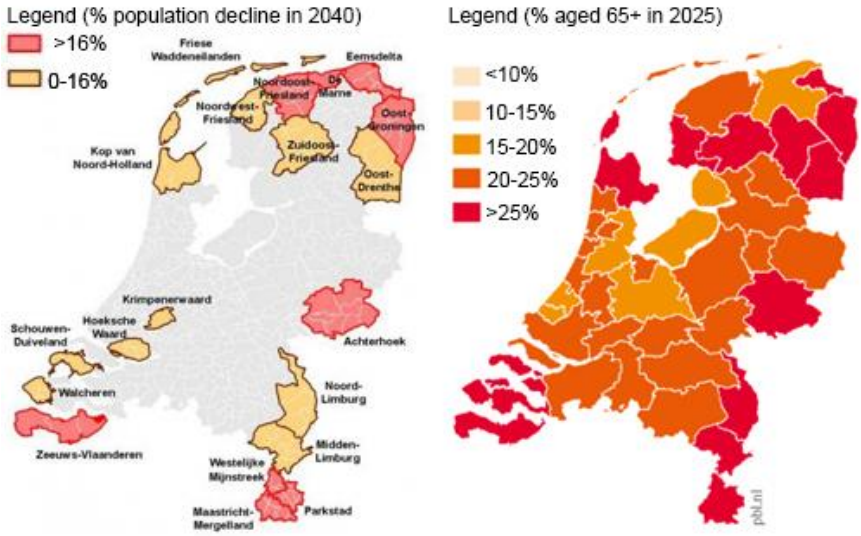
The first objective is thus to assess the effect of region size on the various dimensions of Quality of Life. By assessing the bivariate relationships between the region size and the QoL, it may be assessed where these tipping points lie (if any). Moreover, the clustering methodology may be used to identify regions that do not conform to the hypothesised relationships and go against the general trends in the data.

Related to the latter two characteristics (growth/decline and ageing of the population), nine regions in the Netherlands have been defined as so-called shrinkage regions. These areas are mainly located in border areas of the Netherlands (see Figure 3 a). In these regions the population is expected to decline by 16% within the coming 20 years. As shown in Figure 3 b the shrinkage regions overlap to a large extent with the regions that are expected to show the highest levels of ageing of the population in the coming years.

While the reasons for the decline and the ageing of the population vary by area, the general causes are that fewer children are born and that -especially highly educated- families (with children) tend to move to larger cities. Population decline and the ageing of the population can have major consequences. For example, a declining/ageing population makes a municipality less popular for companies, resulting in job losses. Moreover, there is increasing pressure on the quantity and quality of public services such as schools, stores, hospitals and transportation services (e.g. bus lines). Hence, these trends may be expected to have a (strong) negative impact on the Quality of Life in these regions. Consequently, a self-reinforcing loop may be set into motion, whereby the decline in QoL may motivate (even) more households to move from these regions, which, in turn, leads to (even) more pressure on the provision of public services.

The second objective of this case study is to assess to what extent the expected decline and ageing of the population are indeed negatively correlated with Quality of Life. These questions may be answered by applying standard regression models. The developed clustering methodology may subsequently be used to identify regions that can maintain QoL levels despite the changing composition of the population, i.e. to identify regions that somehow go against the general trends in the data.

Figure 3 Expected population decline (a - left). Expected ageing of the population at NUTS 2/3 level (b - right).



Source: Ministry of the Interior and Kingdom Relations (2018a)

2 Policy context

2.1 Outline of the QoL concept

In the Netherlands, there have been three efforts to define and measure Quality of Life in a geographic context, namely:

1. The **Regional Quality of Living Index (RQI)** developed in 2014 by the Netherlands Environmental Assessment Agency (Lagas et al., 2014), which is a Dutch national research institute. The index covers the whole of Europe at the NUTS 2 level (281 regions in total and 12 provinces in the Netherlands).
2. The **living barometer (in Dutch: leefbaarometer)** developed by RIGO Research & Advice and Atlas for Municipalities in 2009. The development of this index was commissioned by the Dutch Ministry of Housing and the Environment (VROM) and currently falls under the responsibility of the Ministry of Internal Affairs. The index covers the whole of the Netherlands at the neighbourhood level. The index is calculated bi-annually.
3. The **sustainability balance instrument** developed by Telos, Tilburg University in 2014. The development of the tool was commissioned by Dutch North Brabant province to monitor if the region was developing in a sustainable way and was meeting its own sustainability goals. The index covers the whole of the Netherlands at the LAU2 level (355 municipalities) and is measured on an annual basis.

These QOL indices are to various extents embedded institutionally in specific policy cycles. The development of the **RQI** was a stand-alone effort to quantify the Quality of Life in Dutch regions and to benchmark the results against other European regions. Based on the analysis several policy recommendations were formulated, but the developed RQI was not grounded in a particular policy area or cycle.

The **living barometer** is most strongly grounded in policy. It was developed to select neighbourhoods that performed poorly on Quality of Life. Within the selected neighbourhoods (40 in total) there have been continuing efforts to enhance the living conditions using the so-called 'neighbourhood approach' (wijkaanpak). This a long-term (10 years) multi-level governance approach whereby local stakeholders (municipalities, housing corporations, and citizens) organise bottom-up initiatives (street coaches, healthy living programs, neighbourhoods safety teams, etc.) to improve Quality of Life, while the national government sets the boundary conditions. The aim of the program is to increase the QoL within the selected neighbourhoods to the average of the municipality. The living barometer is used to assess the effectiveness of the implemented plans and policies.

Finally, the **sustainability balance instrument** is weakly embedded in policy. The monitor is used on a voluntary basis by individual municipalities to assess their strong and weak points by benchmarking their results to the national average or similar municipalities. Often such benchmarks yield unexpected findings, leading to relevant lessons for municipal authorities. Some 30 specific sustainability balance reports have been made for local authorities in the Netherlands (Zoeteman et al., 2016).

Table 2 provides on overview of the policy context of the three approaches, which have been developed in the Netherlands.

Table 2 Overview of policy context to measure QoL

Actor/institution	Policy context	Description of indicators and data used	Activities and processes
The Netherlands Environmental Assessment Agency (PBL)	The development of the QoL concept was driven by scientific interest, not grounded in policy	9 dimensions and 25 indicators at the NUTS 2 level for whole of EU	No follow-up activities
RIGO Research & Advice and Atlas for Municipalities	The QoL concept was developed to select specific neighbourhoods for a policy program aimed at improving QoL.	The index is based on 5 dimensions and 100 indicators.	The index is used to monitor QoL in selected deprived neighbourhoods
Telos	The QoL concept was developed to assess municipalities in terms of sustainability.	Telos is based on three dimensions and 90 indicators.	The index is used on an on-demand basis in cases specific Dutch municipalities want to evaluate QoL.

2.2 Evolution of the QoL approach

Below, the origins of the three approaches to measure Quality of Life in the Netherlands are detailed.

The Regional Quality of Living Index (RQI) was developed in 2014 by the Netherlands Environmental Assessment Agency. This index was originally developed to assess the attractiveness of Dutch regions for international companies, i.e. not only from an economic perspective, but also from a Quality of Life perspective. The Regional Quality of Living Index (RQI) aimed to address this need, providing an international benchmark of non-business-related indicators that are important to living standards and the quality of the human environment. The results can be used for other purposes, too. For example, to improve the attractiveness of specific regions to students, or in the context of population decline.

The development of the **living barometer** was commissioned in 2008 by the Ministry of Housing and developed by RIGO Research & Advice and Atlas for Municipalities, with the specific purpose of selecting neighbourhoods that performed poorly on Quality of Life. The selected neighbourhoods (40 in total) were part of a program called the neighbourhood approach, herein after referred to as the ***wijkaanpak***, a program that was supported financially by the national government. This a long-term (10 years) governance approach whereby local stakeholders (municipalities, housing corporations, and citizens) organise bottom-up initiatives (street coaches, healthy living programs, neighbourhoods safety teams, etc.) to improve Quality of Life, while the national government sets the boundary conditions. The aim of the program is to increase the QoL within the selected neighbourhoods to the average of the municipality. The living barometer is used to assess the effectiveness of the implemented plans and policies.

The **sustainability balance instrument** was developed by Telos to monitor the level of sustainability of specific municipalities in the South of the Netherlands (North-Brabant). It evolved into a well-founded index to measure QoL at the municipality level and is currently being used by specific Dutch municipalities to assess and monitor QoL.

2.3 Governance levels and the use of QoL in a policy context

Since the **living barometer** is most strongly grounded in policy, we choose this index in this section to detail its uses in the specific policy context in the Netherlands.

As mentioned above the **living barometer** has been developed by the Ministry of Housing to select deprived neighbourhoods with various (social) problems and subject these to a nation-wide program to enhance the Quality of Life in these neighbourhoods. The living barometer has subsequently been used to monitor the efforts of the implemented policies.

Table 3 provides a list of the selected neighbourhoods, which are mostly located in the larger cities in the Netherlands (Amsterdam, Rotterdam and Utrecht). A neighbourhood in the Netherlands is positioned at the sub-LAU level. In total, there are roughly 13,000 neighbourhoods, consisting of 1,200 inhabitants on average.

Table 3 The 40 selected neighbourhoods that were part of the 40+ program

Municipality	**Neighbourhoods**
Alkmaar	Overdie
Amersfoort	De Kruiskamp
Amsterdam	Bos en Lommer, Westelijke Tuinsteden, delen van Amsterdam-Oost, delen van Amsterdam-Noord en de Bijlmer
Arnhem	Klarendal, Presikhaaf, Arnhemse Broek, Malburgen / Immerloo
Den Haag	Stationsbuurt, Schilderswijk, Zuidwest (Bouwlust, Vrederust, Morgenstond en Moerwijk), Transvaal
Deventer	Rivierenwijk
Dordrecht	Wielwijk / Crabbehof
Eindhoven	Woensel West, Doornakkers, Bennekel
Enschede	Velve-Lindenhof
Groningen	Korrewegwijk, De Hoogte
Heerlen	Meezenbroek
Leeuwarden	Heechterp-Schieringen
Maastricht	Noordoost
Nijmegen	Hatert
Rotterdam	Oude Westen, Oude Noorden, Crooswijk, Bergpolder, Overschie, Oud Zuid, Vreewijk en de Zuidelijke Tuinsteden (Pendrecht en Zuidwijk)
Schiedam	Nieuwland
Utrecht	Kanaleneiland, Ondiep, Overvecht, Zuilen Oost
Zaanstad	Poelenburg

Since the inception of the programme, the living barometer is calculated each year to monitor the effects of the wijkaanpak. The policies implemented as part of the wijkaanpak were tailored to suit the specific needs of the selected neighbourhoods, ranging from “merely” implementing street coaches to large-scale restructuring and redevelopment programs. In addition, citizens living in the neighbourhoods were actively engaged in the process of developing solutions. Below we detail the principle ideas behind the adopted wijkaanpak, describing also the various roles stakeholders had within this approach.

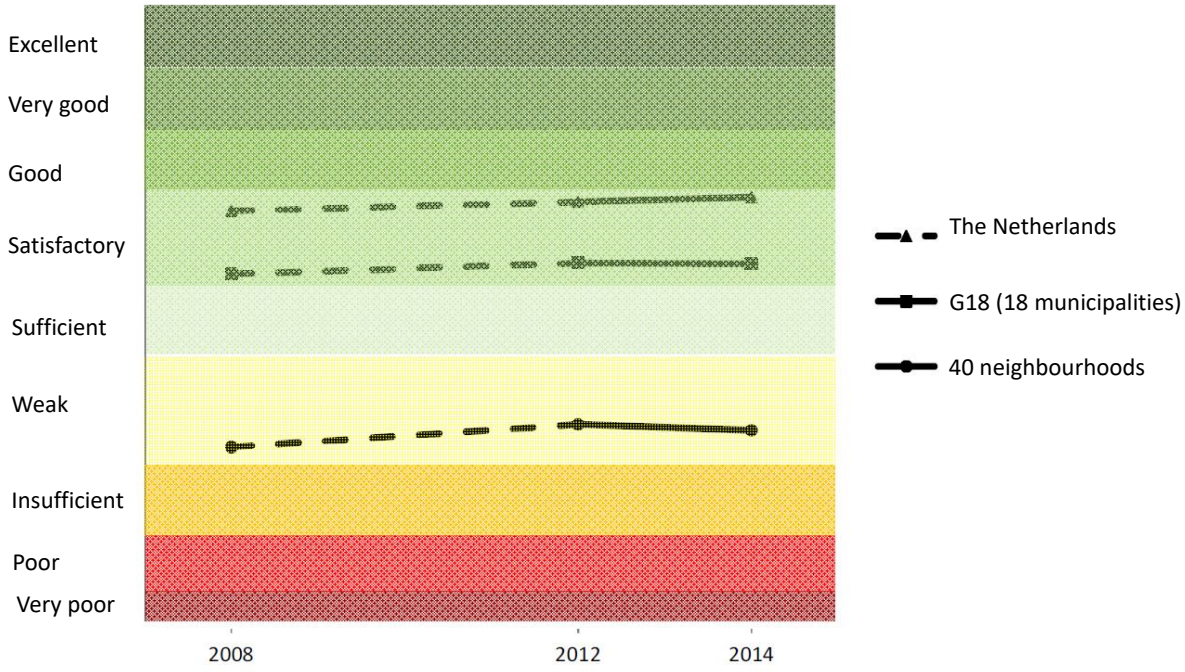
The wijkaanpak is based on the idea that social and liveability problems within deprived neighbourhoods are due to an accumulation of negative factors, related to low income, high unemployment, high crime levels, poorly maintained (social) housing, poorly maintained parks and public works, etc. To get neighbourhoods out of this complex self-enforcing negative spiral it was believed that a coherent and long-term approach was necessary involving various relevant stakeholders as well as the inhabitants themselves. Form the start, it was determined that the wijkaanpak would last 10 years, so that structural change was feasible. The objective

of the wijkaanpak was to get the level of QoL within the selected neighbourhoods to the average level of the respective municipalities they were part of.

The wijkaanpak focused on five pillars: Living, Learning, Working, Security and Integration. Later, the pillars Health and Sport and Culture have also been added. In addition, it is a prime example of a multi-level governance approach, in which collective responsibility was maintained at several policy levels. Specifically, partnerships were developed between the central government and cities in which the central government facilitates, sets frameworks and creates opportunities. The cities themselves make their own policies. Within this process social housing corporations were also actively involved.

In 2015, the wijkaanpak has been evaluated using the living barometer instrument. Figure 4 show the development of the average quality of life in the forty selected neighbourhoods, the G18 (the eighteen municipalities in which the 40 selected neighbourhoods are located) and in the Netherlands as a whole from 2008 until 2014. The results indicate that QoL tends to remain very stable over time. Regarding the selected neighbourhoods, in the period 2008-2012 QoL increased slightly, but decreased again from 2012 onwards. Overall, the results indicate that the wijkaanpak was not successful in substantially increasing QoL in the selected neighbourhoods (or alternatively, the living barometer did not pick up possible relevant changes in QoL). This conclusion was also reached by the Netherlands Institute for Social Research, using an independent quasi-experimental research framework (by matching the 40 neighbourhoods with comparable neighbourhoods) (Permentier et al., 2013).

Figure 4 Development of the average quality of life in the forty selected neighbourhoods, the G18 (including the neighbourhoods) and in the Netherlands between 2008-2014



Source: RIGO Research en Advies en Atlas voor gemeenten, 2015

2.4 Success factors, obstacles and achievement

Overall, while the wijkaanpak did not lead to substantial improvements in QoL, several studies did find specific indications for improvement, highlighting also relevant lessons that were learned. For one it was found that large-scale restructuring of housing did lead to declines in crime levels and increased perceived safety and satisfaction with the living environment of

residents (Permentier et al., 2013). In addition, it was found that the health of citizens in the selected neighbourhoods significantly improved, even though this was not an important criterion from the start of the program. Particularly, the percentage of residents with good mental health in the selected neighbourhoods rose from 73 to 79 percent between 2008 and 2011, while in the Netherlands as a whole it actually decreased (from 85 to 82 percent). In addition, in selected neighbourhoods, the number of people who walked in their free time increased from 55 percent in 2008 to 71 percent in 2011 (Stronks et al.,2014).[1]

In studies that evaluated the wijkaanpak one recurrent theme among the "lessons learned" related to the notion that the relationship between physical and social measures appeared to be an important success factor. In several neighbourhoods, participants mentioned that combining physical and social measures works as a reinforcing force that is crucial for the success of a project. In the wijkaanpak, several physical interventions have taken place in the housing stock through demolition and restructuring. These interventions were usually supported and combined with a social program. While the physical improvements are immediately visible, the social effects only become visible in the longer term. The combination of efforts makes it more likely to have a meaningful impact. In addition, the social neighbourhood approach was also found to reduce residents' resistance to restructuring measures. Demolition or renovation of the house is a major event for residents. A combination with a social program that also looks at the socio-economic situation of residents who are involved in the physical measures means that people are engaged earlier and more actively.

Several reasons have been put forward for the limited/mixed success of the wijkaanpak. One important reasons is that, while the program was supposed to be financially supported for 10 years (at least) the funds already ran out after 4 years. In addition, housing corporations invested much less than was expected on beforehand. It seems plausible that the positive trend observed over the 2008-2012 has not continued (at least partially) because of this. According to Permentier et al. (2013), another reason for the observed limited effect might be related to the high ambitions formulated from the start. These may have led to certain inefficiencies, for example, in terms of high transactions costs involved in coordinating policies among different stakeholders, the extensive process set up for choosing local priorities within the larger program and in organizing and monitoring processes. Possibly the goals have also been so broad that this led to fragmentation of the efforts. Of course, this risk has been further increased by shortening the financing of the program, which also means that possible start-up costs weighted disproportionately heavy overall.

While the wijkaanpak in its outcomes was limited successful, in the process it did lead to several desirable outcomes. For one, it put the notion of liveability and Quality of Life firmly on the political agenda. In addition, it has led to the development of an instrument (the living barometer) that is still used presently to inform policies that aim to improve local QoL.

[1] Stronks, K., Droomers, M., Jongeneel-Grimen, B., Kramer, D., Hoefnagels, C., Bruggink, J. W., ... & Kunst, A. (2014). Een betere wijk, een betere gezondheid? Ontwikkelingen in de gezondheid van bewoners van aandachtswijken tussen 2004-2011. Nederlands Tijdschrift voor Geneeskunde, 158, A7989.

3 Measuring Quality of Life

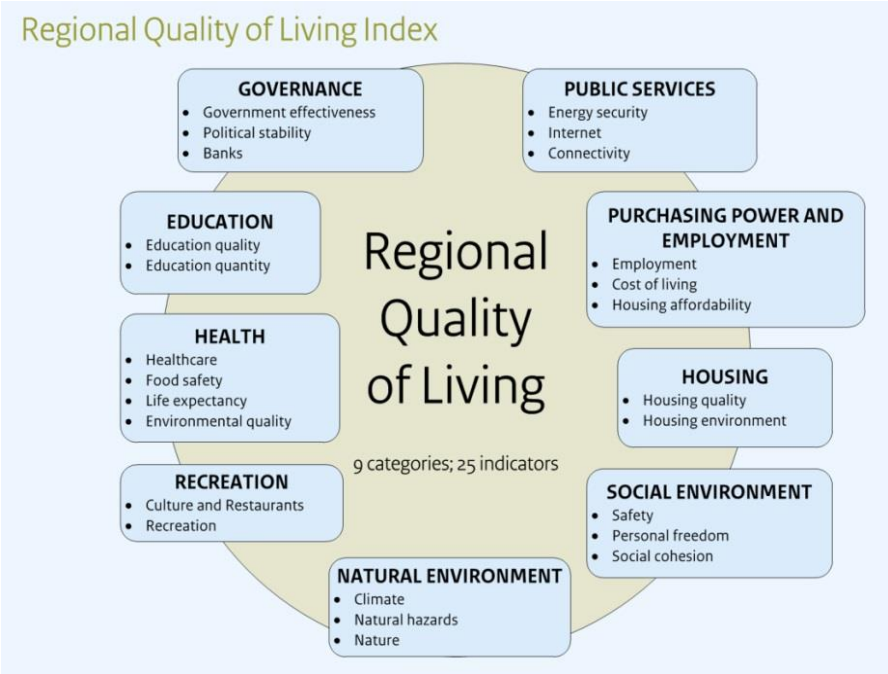
3.1 Indicators and measurement

In this section, the methods used to construct the three QoL indexes that have been developed in the Netherlands are described.

The Regional Quality of Living Index (RQI)

The RQI is based on 9 dimensions and 25 indicators and operationalised at the NUTS 2 level for the whole of Europe. The considered nine dimensions (depicted in Figure 5) were loosely based on the 8 (+1) framework of Quality of Life developed by Eurostat (2017). The specific indicators were chosen from the perspective of local people as well as from the perspective of people from foreign companies who (with their families) want to settle in a specific region. For each of the 25 indicators, between 2 and 7 sub-indicators were selected, 100 sub-indicators in total. Objective and subjective indicators, as well as input and output indicators, were used in a mixed fashion. The data was obtained from various sources (OECD, the European Values Survey, Eurofound, ESPON, Worldbank and Eurostat). The sub-indicators were merged into the 25 indicators (using a combination of techniques) and these were normalised to range from 1 (worst score) to 10 (best score) and then subsequently combined into a composite index using equal weights. A sensitivity analysis showed that the use of other weighing schemes had little impact on the results. The followed methodology was based on the OECD-JRC handbook on constructing composite indicators (OECD-JRC-EC, 2008). More details can be found in the original report (Lagas et al., 2014).

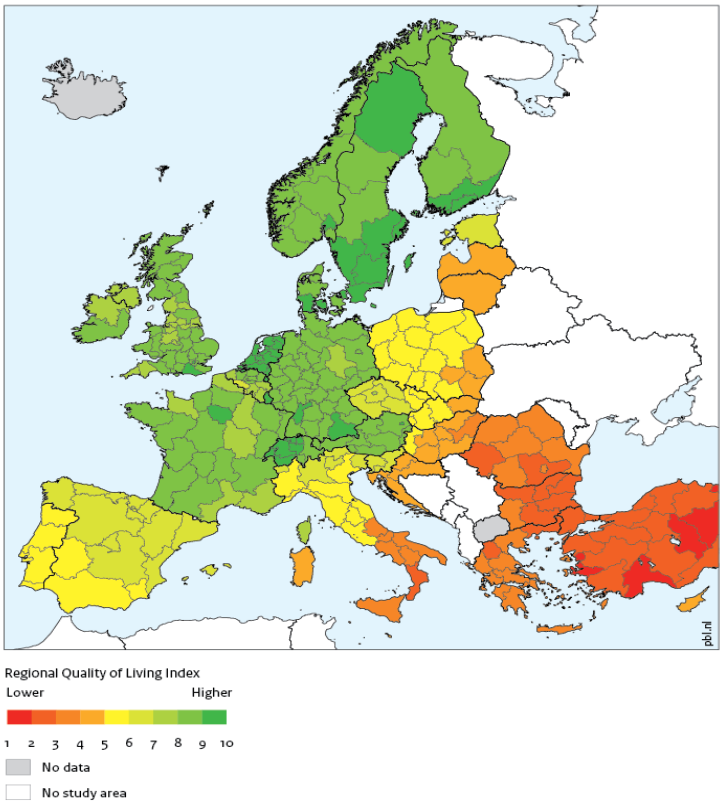
Figure 5 The Regional Quality of Living Index (25 indicators across 9 dimensions)



Source: Lagas et al. (2014)

Figure 6 shows the result of the final composite Regional Quality of Living Index for the NUTS2 regions in Europe. Overall, the Dutch provinces were found to perform (relatively) well. Based on the scores on the sub-dimensions, the results were used to formulate specific policy recommendations, for example, to improve the connectivity by road and rail particularly for the northern regions of the Netherlands.

Figure 6 Regional Quality of Living Index



Source: Lagas et al. (2014)

The living barometer

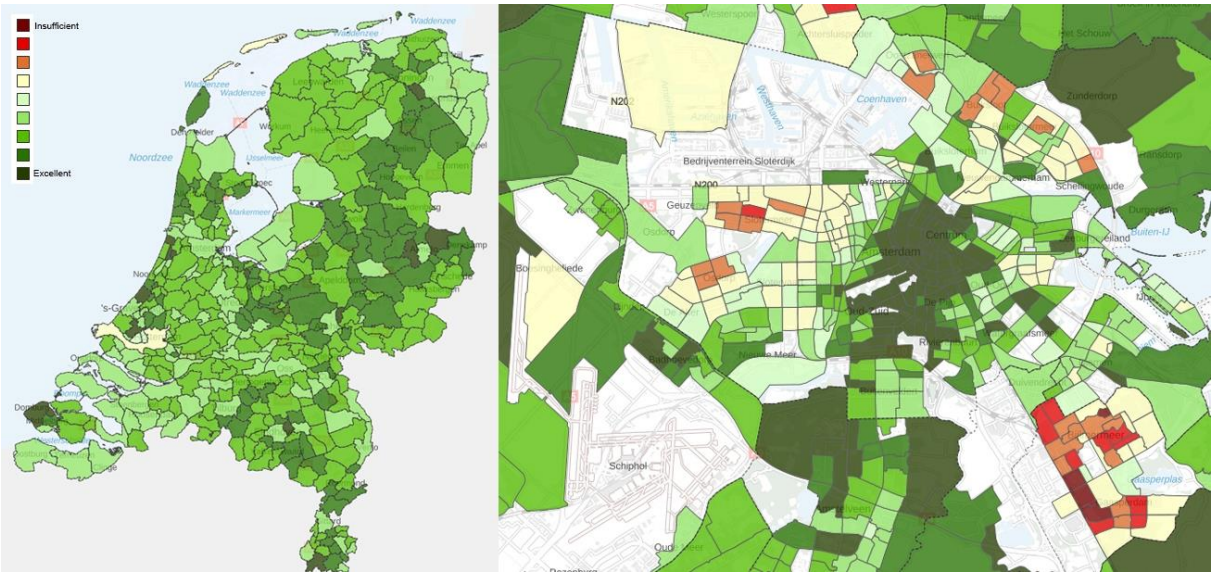
The living barometer was developed originally in 2009 and has been redesigned in 2014 (Leidelmeijer et al., 2014). The index, which is not strongly theoretically grounded, is based on five dimensions, which are *housing* (e.g. building period, social housing), *physical environment* (e.g. distances to green areas, roads, and noise exposure), *services* (e.g. distances to schools, shops and jobs), *residents* (e.g. income, age, education, ethnic background) and *safety* (e.g. crimes, annoyance by youth). The five domains are measured by 100 indicators exactly. The selection of these indicators is mainly motivated by practical reasons (coverage and availability over time) and not by theoretical arguments. Moreover, with the exception of 6 indicators related to perceived (un)safety, all indicators are objective in nature.

To determine whether indicators contribute positively or negatively to Quality of Life they are regressed on the local housing prices. The resulting regression weights are also used to determine the weight of each indicator. It should be noted that this method has been criticised on the grounds that certain groups of people cannot afford expensive houses and are thereby drawn to neighbourhoods with low housing prices, for example, young couples (Deijl, 2012). Obviously, this does not mean that their characteristics have a detrimental effect on the Quality of Life (one would expect even the opposite).

Most indicators are measured at the 6-digit postal code level (on average 40 households) and some at the 4-digit postal code level (representing a neighbourhood). This allows the creation of highly disaggregated maps, which may be used to identify specific neighbourhoods with low (or high) scores. For example, Figure 7 (right side) shows the results of the 2018 measurement for the city of Amsterdam. Here specific poorly performing neighbourhoods may be identified. Of course, the data may also be aggregated to higher levels. For example, Figure 7 (left side)

shows the results of the index for the whole of the Netherlands at the LAU2 level. Interestingly, by aggregating the data to this level, all municipalities are found to perform sufficient or higher, thus obscuring the results or the more local level.

Figure 7 Leefbarometer 2018 at LAU2 level (a - left) Leefbarometer 2018 at the neighbourhood level for the municipality of Amsterdam (b - right)



Source: Ministry of the Interior and Kingdom Relations (2018b)

Sustainability balance instrument (Telos)

While the sustainability balance instrument is not directly aimed at measuring Quality of Living, its theoretical basis fits well with existing Quality of Life frameworks. The index is based on the three pillars of sustainability, namely the ecological, socio-cultural and economic domains. Sustainable development is conceived as a development process that aims to foster balanced growth in the quality of nature ('ecological dimension'), in the physical and spiritual wellbeing of people ('socio-cultural dimension') and healthy economic development ('economic dimension').

For each of the three dimensions, 5-7 sub-dimensions ('stocks') are defined, which, in turn, are operationalised using 2-7 indicators. A balanced mix of objective and subjective indicators is used. In total, 19 stocks and 90 indicators are defined and measured (see Table 4). The selection of the indicators is based on the literature and past experiences of the developers and can thus be qualified as rather ad-hoc. It should be noted though, that when Telos makes a sustainability balance for a specific municipality, local stakeholders are also involved in the selection of indicators.

For each indicator, a specific norm is established. Based on this norm, it is calculated to what extent the current level of the indicator achieves this norm. Hence, each actual indicator score is expressed as a percentage of the sustainability goal achieved. A total score for each stock is determined by adding the weighted scores from the indicators involved. The results of the stocks are then added with equal weight to calculate the dimension score. Finally, the three dimensions are weighted equally to calculate the overall sustainability score for a municipality, expressed as the average percentage of the overall sustainability goal achievements.

The data are obtained from various sources (20 in total) at the LAU2 level (the level of municipalities), mostly from Statistics Netherlands, but also from Health Services of

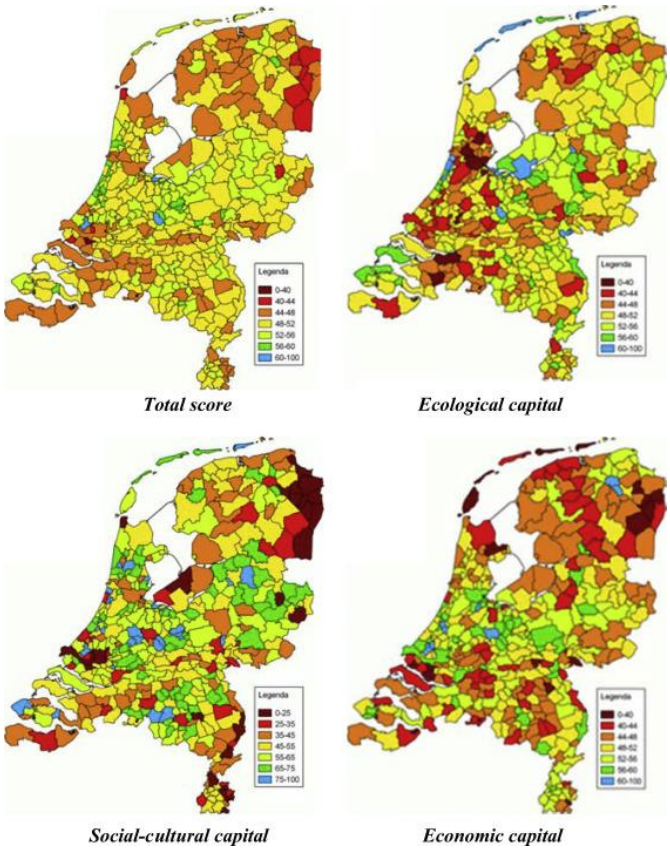
Municipalities, the National Soil Sanitation Survey, the Biodiversity Network and the National Climate Monitor.

Table 4 Dimensions and indicators of the sustainability balance instrument (Telos)

Ecological dimension	**Indicators**
Soil and groundwater	Soil clean-up, quantity of manure applied
Air	Emission of CO_2, emission of NO_x, emission of PM10, emission of VOS, concentration NO_x, concentration PM10, concentration VOS
Noise/odors/external safety	Noise annoyance, odor annoyance, risk of a disaster
Surface water	Ecological quality, chemical quality
Nature and landscape	Satisfaction with green areas in city, share of forest and natural area, distance of public green spots, share of inland recreational water, biodiversity
Energy and climate	District heating, wind energy, solar energy, average natural gas consumption, average electricity consumption, energy label of houses
Waste and raw materials	Household waste, organic waste, paper and cardboard waste, packaging glass, plastic
Social–cultural dimension	**Indicators**
Social cohesion	Poor households, social inclusiveness, volunteers
Participation	Turnout in municipal elections, turnout in national elections, long-term unemployment, long-term social assistance, informal care
Arts and cultural heritage	Performing arts, national monuments, museums
Health	Insufficient exercise, risky behaviour, number of GP practices, quality of hospitals, distance to hospital, life expectancy, assessment of own health, chronically sick people
Safety	Violent crimes, crimes against property, youth crime, vandalism, road safety, feeling of insecurity
Living environment	Housing deficit, distance to supermarket, satisfaction with living environment, satisfaction with shops, real estate value, house-moving balance, population development
Education	Youth unemployment, number of elementary schools, number of secondary schools, early school leavers, real-time to diploma, graduation rate, education level of population
Economic dimension	**Indicators**
Labour	Employment function, human resources exploitation, unemployment, hazing and ageing, incapacity for work
Spatial establishment Conditions for businesses	Stock of business parks, net/gross ratio of business parks, share of out-of-date business parks, stock of office space, vacant office space
Economic structure	Share of starters, bankruptcies, disposable income, gross regional product per capita, share of nationally promoted (top) sectors
Infrastructure and mobility	Access to public transport, access to main roads
Knowledge	Proportion of highly educated people, capacity for scientific education/higher vocational education, high-tech and medium-tech employment, creative industry share

Figure 8 presents the scores of the total sustainability score as well as the scores for the three dimensions (ecological, social-cultural and economic) for all municipalities in the Netherlands. The results show that -in line with intuition- large cities perform relatively well on the economic dimension while performing poorer on the ecological and social-cultural dimension. This pattern is reversed for less populated regions. Moreover, it can be observed that in the shrinkage regions both social-cultural dimension and economic dimension performs poorly, for example, the north-eastern part of the Netherlands (the provinces of Groningen en Drenthe) and the south-western part (Zeeland).

Figure 8 National overview of municipal scores (scale from 0–100% sustainable) for total sustainability and the ecological, socio-cultural and economic sustainability dimensions



Source: Zoeteman et al. (2016)

Synthesis

Table 5 provides an overview of the three Quality of Life indices in terms of relevant characteristics.

Table 5 Synthesis of the three QoL indicators

	Theoretical basis	No. of dimension	No. of indicators	level	Coverage	Objective/ subjective	Input/output	Time period
Regional Quality of Living Index	Strong	9	25 (100 sub-indicators)	NUTS2	EU	mixed	mixed	2014
Living barometer	Weak	5	100	LAU2 and neighbourhoods	Only NL	mostly objective	mixed	2002-present

Sustainability balance instrument	Moderate	3 (19 stocks)	90	LAU2	Only NL	mixed	mixed	2014-present

Since the living barometer and the sustainability balance instrument are operationalised at the same geographical scale (LAU2), the overlap in their respective dimensions may also be empirically assessed. The respective correlations are shown in Table 6 (arched yellow). The results show that the ecological dimension correlates strongly with the physical environment, while the social-cultural dimension correlates strongly with both the residents and safety dimension of the living barometer. Interestingly, the economic dimension does not correlate strongly with any of the living barometer dimensions.

Table 6 Correlations between the leefbarometer and sustainability balance total scores and dimensions at the LAU2 level (N=355) in 2016

	Living barometer score	Housing	Residents	Services	Safety	Physical environ-ment	Total sustainability score	Social-cultural dimension	Ecological dimension
Living barometer score	1								
Housing	0.247**	1							
Residents	**0.549****	-0.107*	1						
Services	0.211**	0.133*	-0.499**	1					
Safety	**0.626****	-0.018	0.769**	**-0.544****	1				
Physical environment	0.336**	-0.111*	**0.537****	**-0.646****	**0.581****	1			
Total sustainability score	**0.541****	0.084	0.397**	0.000	0.402**	0.304**	1		
Ecological dimension	0.352**	-0.017	0.352**	-0.248**	0.350**	**0.581****	**0.520****	1	
Social–cultural dimension	**0.567****	0.060	**0.538****	-0.148**	**0.558****	0.359**	**0.854****	0.298**	1
Economic dimension	0.147**	0.122*	-0.106*	0.384**	-0.141**	-0.298**	**0.604****	-0.133*	0.329**

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

Large correlations (absolute values greater than 0.5) are shown in bold

3.2 Data sources for QoL

The **RQI** index at NUTS 2 level for the whole of Europe is available via the Netherlands Environmental Assessment Agency (Lagas et al., 2014). The index is only available for the year 2014.

The **living barometer** is available at both the neighbourhood and municipality (LAU2) level for the whole of the Netherlands for the following years: 2002, 2008, 2012, 2014, 2016 and 2018. In addition to the composite index, data is available on each of the 5 dimensions (housing, physical environment, services, residents, safety). All data are available online and may be accessed via https://www.leefbaarometer.nl/kaart. Most data are provided by Statistics Netherlands.

The **sustainability balance instrument** is available at the municipality (LAU2) level for the whole of the Netherlands for the following years: 2014, 2015, 2016 and 2017. In addition to the composite index, data is available on each of the 19 stocks and the 3 dimensions (ecological,

socio-cultural and economic). All data are available online and may be accessed via https://www.waarstaatjegemeente.nl/jive.

Table 7 lists the relevant contacts for each of the three indices.

Table 7 Relevant contacts in the Netherlands

	Organization	**People**
Regional Quality of Living Index	Netherlands Environmental Assessment Agency	Piet Lagas Rienk Kuiper Frank van Dongen
Living barometer	RIGO Research & Advice Atlas for Municipalities	Kees Leidelmeijer Marten Middeldorp Gerard Marlet
Sustainability balance instrument	Telos, Tilburg University	John Dagevos Bastiaan Zoeteman

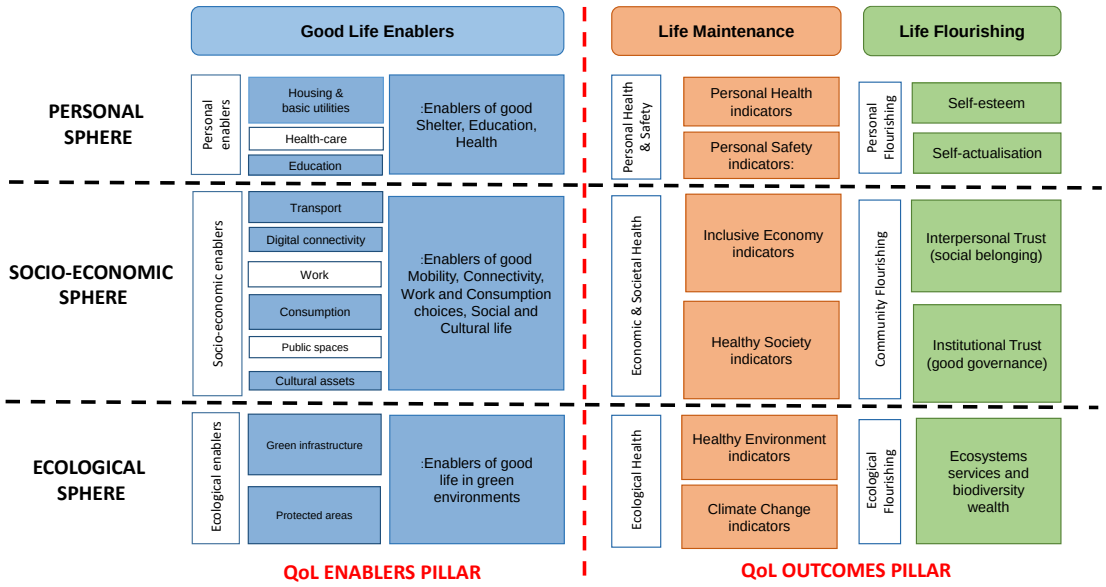
4 Analysing and testing the methodology used in the case study as compared to the TQoL approach

4.1 Comparing the QoL approach in the case study with the TQoL conceptual model

In the following, the three approaches to measure QoL that have been developed in the Netherlands are mapped onto our TQoL framework.

In figure 9 highlights the (sub-) dimensions of the TQoL framework that are covered by the nine dimensions of Regional Quality of Living Index. It can be seen that most dimensions are covered, with the exception of three QoL enablers, namely (access to) health-care, jobs and public spaces. The correspondence between our TQoL framework and the RQI may be explained by the fact that both are (strongly) theoretically grounded.

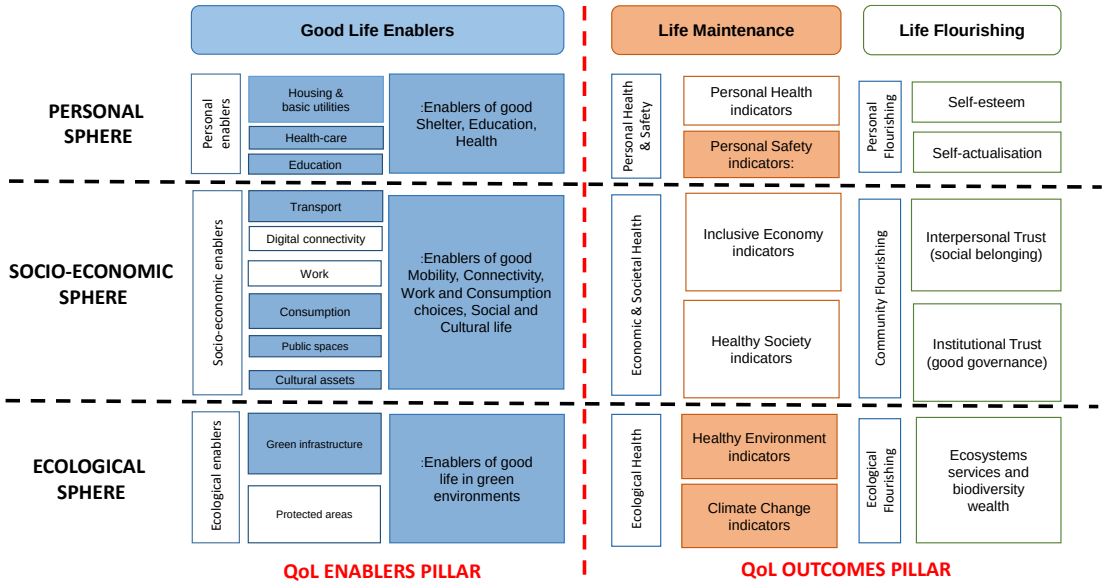
Figure 9 TQoL framework for the Regional Quality of Living Index



As mentioned above, the living barometer is based on the following (five) main dimensions: housing, physical environment, services and safety. The used indicators within these dimensions largely cover the enablers of the TQoL framework (see Figure 10). In addition, the personal safety dimension, which forms one of the five dimensions of the living barometer, is extensively covered (with 8 indicators related to crime, vandalism, etc.). Finally, climate change is covered by the risk of flooding, which, for the Netherlands, is an important indicator as the country is mostly below sea level.

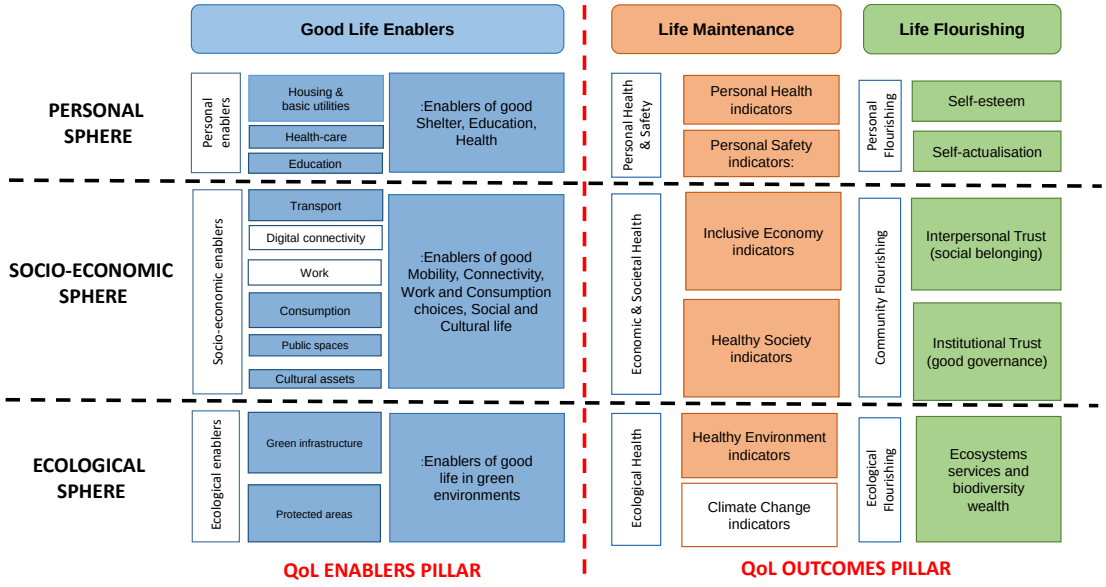
One of the dimensions of the living barometer, the one related to *residents*, is not covered in the TQoL framework. The other way around, most of the life maintenance and life flourishing dimensions are not covered by the living barometer, which can explained by the fact that indicator selection for the living barometer is mostly based on practical reasons related to data availability and coverage over time and place. Consequently, it makes sense that the theoretically grounded categories of the TQoL framework are not adequately covered.

Figure 10 TQoL framework for the living barometer



Lastly, figure 11 illustrates the overlap between the sustainability balance instrument and our TQoL framework, which is substantial. In fact, only three sub-dimensions of the TQoL are not covered (digital connectivity, access to work and climate change indicators). The increased overlap in the measurement systems (compared to the living barometer) may again be explained by the fact that the sustainability balance instrument is more strongly theoretically grounded than the living barometer.

Figure 11 TQoL framework for the sustainability balance instrument



4.2 Coding the indicators

Tables 8, 9 and 10 respectively code the indicators of the Regional Quality of Living Index, Living barometer, and Sustainability Balance Instrument to the dimensions of the TQoL framework. It is interesting to note that none of the Dutch QoL indices covers (access to) jobs and/or work opportunities. As mentioned above, it can be observed that the living barometer

only covers a subset of the dimensions of the TQoL framework, while the RQI and Sustainability Balance Instrument, cover the majority of the dimensions.

Table 8 Coding of the Regional Quality of Living Index indicator system

Dimension	Domain	Sub-domain	Indicator
Good Life Enablers	Personal enablers	Housing & basic utilities	Housing Affordability Price owner-occupied housing (relative), Price rented housing (relative), Cost of living Price goods, Housing quality, Average price per m2, Rooms per person, Energy security and access
		Health	
		Education	Number of universities per region (Distance decay calculation), N-international schools per region
	Socioeconomic enablers	Transport	Connectivity Satisfied with public transport, Rail accessibility, Road accessibility
		ICT connectivity	Internet Satisfied with public internet access
		Work opportunities	
		Consumption opportunities	Michelin star restaurants (Distance decay calculation), Satisfied with sports facilities, Area for recreational sports and leisure use, Satisfied with cinemas
		Public spaces	
		Cultural Assets	Satisfied with cultural facilities
	Ecological enablers	Green infrastructure	Green space (in m2) to which the public has access, Proportion of the area in green space
		Protected areas	Nature reserves
Life Maintenance	Personal Health and Safety	Personal health indicators	Life expectancy, Per capita government expenditure on health, Satisfied with healthcare, Satisfied with doctors, Heart disease death rate
		Personal safety indicators	Safety Feel safe in this city, Organised crime
	Economic and Societal Health	Inclusive economy indicators	Unemployment 15–24 year age group, Unemployment 20–65 year age group
		Healthy Society indicators	Participating in social activities of a club, society or association, unpaid voluntary work, Quality of University – best 20% in world
	Ecological Health	Healthy Environment indicators	Satisfied with outdoor recreation, Environmental quality Air pollution is a big problem here, Noise is a big problem here, This is a clean city, Number of days ozone concentration exceeds 120 µg/m³, Number of days particulate matter concentration (PM10) exceeds 50 µg/m³, Accumulated ozone concentration in excess 70 microgram/m3, Annual average concentration of PM10 UA-Key 2011
		Climate change indicators	Number of days of rain per year, Average number of hours of sunshine per day, Average temperature of warmest month, Average temperature of coldest month
Life Flourishing	Personal Flourishing	Self-esteem	Freedom (Country Indicator), Civil Rights, Access to Information, Voice and accountability, Social cohesion (country indicator)
		Self-actualization	Aged 15 to 64 qualified at tertiary level (ISCED 5–6)
	Community Flourishing	Interpersonal Trust (Social Belonging)	Most people can be trusted, Most of the time: people helpful or mostly looking out for themselves
		Institutional Trust (good governance)	Regulatory Quality, rule of Law, control of Corruption, political Stability, political Terror Scale, absence of Violence/Terrorism, physical Integrity Rights Index
	Ecological Flourishing	Ecosystems services and biodiversity wealth	

Table 9 Coding of the Living barometer indicator system to the TQoL framework

Dimension	Domain	Sub-domain	Indicator
Good Life Enablers	Personal enablers	Housing & basic utilities	Building periods, % social housing, % detached and row houses
		Health	Distance to hostipals, distance to general practitioner
		Education	Distance to primary schools, high schools
	Socioeconomic enablers	Transport	Distances to roads, railway stations
		ICT connectivity	
		Work opportunities	
		Consumption opportunities	Distances to grocery stores, restaurants, cafes
		Public spaces	Situated near park
		Cultural Assets	Number of monuments
	Ecological enablers	Green infrastructure	distances to green areas
		Protected areas	Situated near forest or water
Life Maintenance	Personal Health and Safety	Personal health indicators	
		Personal safety indicators	Crimes, annoyance by youth
	Economic and Societal Health	Inclusive economy indicators	
		Healthy Society indicators	
	Ecological Health	Healthy Environment indicators	Noise exposure, distance to high-voltage power line.
		Climate change indicators	Risk of flooding
Life Flourishing	Personal Flourishing	Self-esteem	
		Self-actualization	
	Community Flourishing	Interpersonal Trust (Social Belonging)	
		Institutional Trust (good governance)	
	Ecological Flourishing	Ecosystems services and biodiversity wealth	

Table 10 Coding of the Sustainability Balance Instrument indicator system

Dimension	Domain	Sub-domain	Indicator
Good Life Enablers	Personal enablers	Housing & basic utilities	Housing deficit, district heating, wind energy, solar energy, average natural gas consumption, average electricity consumption, energy label of houses
		Health	Number of GP practices, quality of hospitals, distance to hospital
		Education	Distance to primary schools, high schools
	Socioeconomic enablers	Transport	Access to public transport, access to main roads
		ICT connectivity	
		Work opportunities	
		Consumption opportunities	distance to supermarket, satisfaction with living environment, satisfaction with shops
		Public spaces	Distance of public green spots
		Cultural Assets	Performing arts, national monuments, museums
	Ecological enablers	Green infrastructure	distances to green areas
		Protected areas	Satisfaction with green areas in city, share of forest and natural area, share of inland recreational water
Life Maintenance	Personal Health and Safety	Personal health indicators	Insufficient exercise, risky behaviour, life expectancy, assessment of own health, chronically sick people
		Personal safety indicators	Violent crimes, crimes against property, youth crime, vandalism, road safety, feeling of insecurity
	Economic and Societal Health	Inclusive economy indicators	Poor households, social inclusiveness, volunteers
		Healthy Society indicators	Employment function, human resources exploitation, unemployment, hazing and ageing, incapacity for work, stock of business parks, net/gross ratio of business parks, share of out-of-date business parks, stock of office space, vacant office space
	Ecological Health	Healthy Environment indicators	Emission of CO2, emission of NOx, emission of PM10, emission of VOS, concentration NOx, concentration PM10, concentration VOS, Noise annoyance, odor annoyance, risk of a disaster, ecological quality, chemical quality
		Climate change indicators	
Life Flourishing	Personal Flourishing	Self-esteem	Proportion of highly educated people, capacity for scientific education/higher vocational education, early school leavers, real-time to diploma, graduation rate, education level of population
		Self-actualization	High-tech and medium-tech employment, creative industry share
	Community Flourishing	Interpersonal Trust (Social Belonging)	Social inclusiveness, volunteers, long-term social assistance, informal care
		Institutional Trust (good governance)	Turnout in municipal elections, turnout in national elections
	Ecological Flourishing	Ecosystems services and biodiversity wealth	Biodiversity

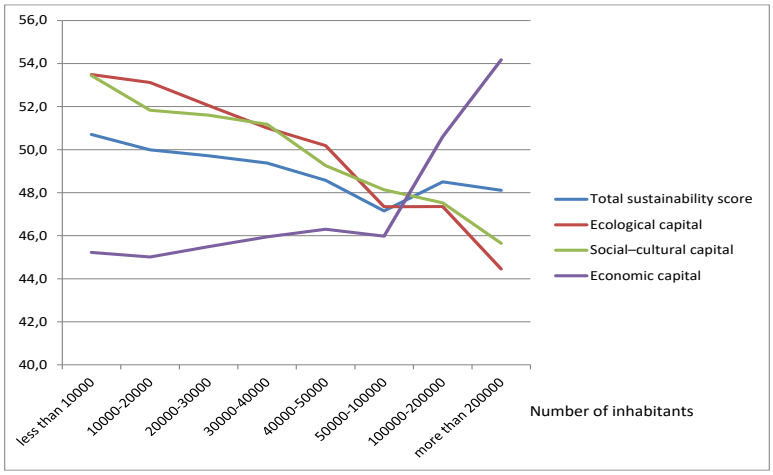
4.3 Application of the LC cluster analysis

In the following, the LC clustering technique is applied to the case of the Netherlands. The aim here is twofold, namely, (1) to provide a pilot illustration of the methodology for a greater level of territorial detail, and (2) to assess how three structural conditions (municipality size, declining population and ageing of the population) influence the regional Quality of Life. The overarching goal is to show that the clustering methodology can reveal meaningful underlying QoL patterns that are obscured when calculating a composite index.

The method is applied using the data from the **sustainability balance instrument**. For this index, data is available at the LAU2 level. Moreover, this index is better theoretically grounded and contains a more balanced mix of objective and subjective indicators, compared to the living barometer.

Figure 12 provides the results of an initial exploration of the relationships between the size of the region (number of inhabitants) and the total score on the sustainability balance instrument as well as its three dimensions for all 355 municipalities in the Netherlands in 2017. In line with expectations, the social and ecological dimensions consistently decline with increasing municipality size, while the economic dimension increases with region size. Interestingly, however, the economic dimension remains relatively stable and only increases from a size of 100,000 inhabitants onwards.

Figure 12 Relationships between municipality size and the (dimensions of the) sustainability balance instrument (N=355)



Source: Own elaboration

To explore additionally the effects of the decline and ageing of the population three regression models were estimated using the municipality size, the percentage decline in the population over the period 2014-2017 and the percentage of the population aged 65+ as explanatory variables. Table 11 provides the (standardised) estimates of these models.

The coefficients for municipality size show that as the municipality size increases, the total sustainability score and scores for the ecological and social-cultural dimensions decrease. Surprisingly, however, a negative coefficient is found for the relation between municipality size and the economic dimension (albeit not significant at the 5% level). Hence, municipality size does not seem to have a strong (positive) influence on the economic dimension of the municipality (after controlling for population decline and percentage aged 65+).

The percentage with population decline is strongly negatively associated with both social-cultural dimension and economic dimension. Hence, as expected, a declining population puts pressure on the Quality of Life in terms of these dimensions, although the direction of causation cannot be inferred from these (cross-sectional) analyses. Finally, the percentage of the population aged 65 or above is positively correlated with ecological dimension and negatively with economic dimension. Regarding the former association, this is likely due to self-selection, i.e. older people choosing to live in less urban regions that score higher on the ecological dimension.

Table 11 Standardised estimates of the regression models predicting the (dimensions of the) sustainability balance instrument

	Total sustainability score		**Ecological dimension**		**Social-cultural dimension**		**Economic dimension**	
	beta	**p-value**	**beta**	**p-value**	**beta**	**p-value**	**beta**	**p-value**
Municipality size	-0.408	0.000	-0.228	0.000	-0.478	0.000	-0.084	0.090
Population decline (%)	-0.391	0.000	0.026	0.628	-0.419	0.000	-0.323	0.000
Aged 65+ (%)	-0.038	0.483	0.243	0.000	0.048	0.345	-0.369	0.000
R-square	0.291		0.165		0.375		0.307	

To explore the qualitative patterns underlying the general trends in the data, the three dimensions of the sustainability balance instrument were subsequently entered as indicators of a latent class model using the municipality size as an (active) covariate to predict class membership. To illustrate the fact that different QoL patterns may underlie similar overall QoL values, the mean total sustainability score for the different classes was calculated separately and added to the profiles. In addition, the percentage decline in the population over the period 2014-2017 and the percentage of the population aged 65+ were included as (inactive) covariates. Finally, also the ESPON typologies were included as (inactive) covariates to profile the classes additionally.

To find the optimal number of latent clusters different models were estimated with varying numbers of latent classes and compared in terms of model fit, model complexity (the number of parameters) and interpretability. In this case, the model with five classes was found to provide a good balance with respect to these criteria.

Table 12 provides an overview of the profiles of the five classes and figure 13 maps class membership (based on modal assignment). A large portion (49%) of the municipalities is assigned to the first-class representing an average profile. The mean scores for the three dimensions as well as the distribution of the covariates correspond closely with the sample means and distributions (presented in the last column). Figure 13 shows that these regions can be found across the Netherlands.

Class two (27% of the sample) represents a high QoL profile, with above-average scores on all three dimensions. Especially the high score on the economic dimension is remarkable considering that most municipalities in this class are relatively small in size (between 10,000 and 30,000 inhabitants). Hence, also smaller regions are able to score high on the economic dimension. Similar to class 1 the municipalities are spread out throughout the Netherlands, with the exception the northern part. Yet, all the Wadden islands are assigned to the second class. Hence, even these remote locations succeed in providing a high Quality of Life on all three dimensions.

Next, class 3 (10% of the sample) performs very poorly, especially in terms of the ecological and social-cultural dimensions, but also to a lesser extent on the economic one. These are mostly mid-sized municipalities (50,000-100,000 inhabitants). Hence, even though the municipalities in this class are on average larger than the regions in class 2 they score lower on the economic dimension. At the same time, they do experience the lower social-cultural and ecological problems associated with larger cities. Figure 13 shows that these municipalities can mainly be found in the border regions, but also in the inner parts of The Netherlands (e.g. the municipalities of Rotterdam, Almere, and Eindhoven).

In terms of the total sustainability balance score class 4 (7% of the sample) performs in line with the sample average and thus similar to class 1, but the underlying pattern is distinct from

the first class. The performance is relatively poor in terms of the ecological and social-cultural dimensions, while the above average (actually highest across all classes) for the economic one. The municipalities in this class are relatively large (+100,000 inhabitants), which may explain the high performance on the economic dimension. Interestingly, unlike the cities/municipalities in class 3 these municipalities, while being the largest in size on average, still perform relatively well on the ecological and social-cultural dimension. Figure 13 again shows that the municipalities in the class can be found throughout the Netherlands. In addition, three (out of the four) main cities in the Randstad area are assigned to this class (Amsterdam, Utrecht and The Hague).

In terms of the total sustainability balance score, the final class (7% of the sample) performs equally poorly as the municipalities in class 3, but for a different reason. In these municipalities, the ecological dimension scores very high (among the highest of all classes), but the municipalities score very low on the social-cultural and economic dimension. These are also the regions that have been affected by population decline in the past 3 years and have the highest percentage of the population aged 65 or higher. Moreover, most regions in this class (77%) belong to the ESPON classification of a "Region with industrial branches losing importance". Hence, these structural conditions indeed put pressure on the social and economic dimensions of Quality of Life. Similar to class 2 these municipalities can be found in the border regions of the Netherlands overlapping to a large extent with the shrinkage regions, i.e. regions with the higher percentage of municipalities with population decline.

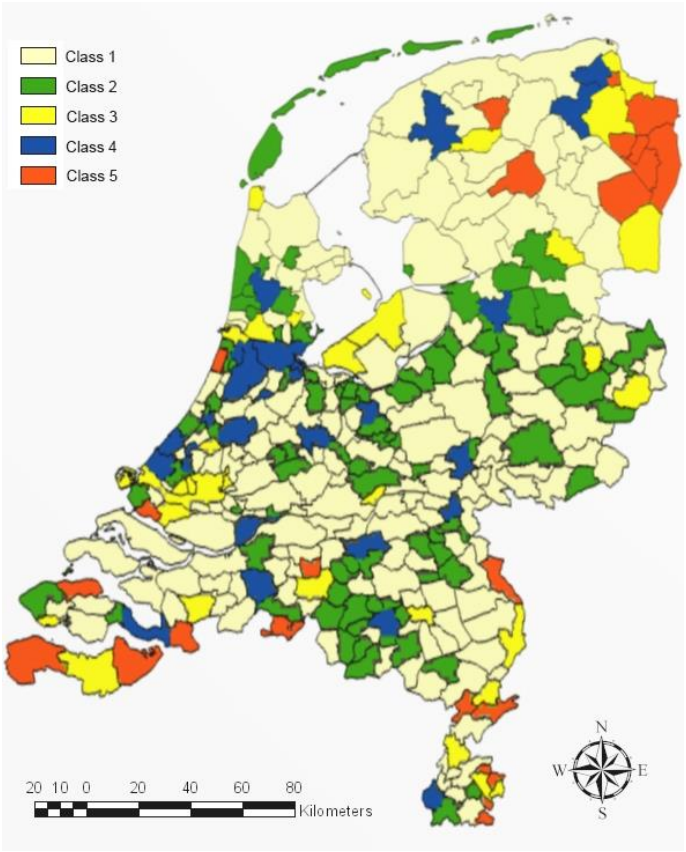
Overall, the approach illustrates that distinctive profiles may underlie similar overall scores and that it is thus necessary to reveal these profiles for a better understanding of Quality of Life in any specific region. Moreover, the analysis shows that there may exist specific classes that go against the general relationships in the data (as shown in Figure 13 and Table 12). The municipalities belonging to these classes may be considered for future in-depth studies to explore the reasons why they seem to perform much better (or worse) than should be expected based on their structural characteristics.

Table 12 Five QoL profiles for the Dutch municipalities

	Class					Sample (N=355)
	1	2	3	4	5	
Cluster Size (%)	49	27	10	7	7	
Indicators						
Ecological dimension	54.4	56.5	51.3	50.7	56.4	54.6
Social–cultural dimension	50.4	56.9	40.8	46.7	44.0	50.6
Economic dimension	46.9	49.2	44.1	52.6	38.8	47.1
Total sustainability balance score	50.6	54.2	45.4	50.1	46.3	50.8
Covariates						
Municipality size (no. of inhabitants)						
less than 10,000 (%)	0	12	0	5	12	5
10,000-20,000 (%)	14	38	0	0	22	19
20,000-30,000 (%)	25	39	5	13	48	27
30,000-40,000 (%)	20	7	2	0	18	13
40,000-50,000 (%)	22	2	11	2	1	13
50,000-100,000 (%)	19	2	57	0	0	15
100,000-200,000 (%)	1	0	15	62	0	6
more than 200,000 (%)	0	0	10	19	0	2
Decline and aging of the population						
Decline in population 2014-2017 (%)	-1	-2	-1	-2	1	-1
Population aged 65+ (%)	21	21	20	17	24	21
ESPON typologies						
Typology on urban-rural regions						
1 Predominantly urban region	61	71	66	76	41	64

	Class					Sample (N=355)
	1	2	3	4	5	
21 Intermediate region, close to a city	39	29	31	24	52	35
31 Predominantly rural region, close to a city	0	0	3	0	6	1
Typology on metropolitan regions						
'0 Other regions	46	41	32	27	59	43
1 Capital city region	14	26	16	28	4	18
2 Second tier metro region	10	5	23	15	3	10
3 Smaller metro region	30	29	29	29	35	30
Border regions - internal and external						
0 other regions	45	51	37	48	9	43
1 internal border programmes (EU + EFTA)	55	49	63	52	91	57
Typology on coastal regions						
A Coastal regions with a low share of coastal population	3	4	6	19	0	5
B Coastal regions with a medium share of coastal population	10	3	8	4	26	9
C Coastal regions with a high share of coastal population	8	5	16	5	6	8
D Coastal regions with a very high share of coastal population	11	16	19	29	19	15
E Areas not covered by classification	68	71	50	43	49	64
Typology on regions in industrial transition						
A1 Region with industrial branches losing importance	49	43	51	27	77	48
A3 Region with internal industrial structural change	1	2	6	4	4	2
B Area not covered by typology	50	55	43	69	19	50

Figure 13 Class membership of Dutch municipalities



Source: Own elaboration

5 Synthesis and conclusions

In the Netherlands three approaches to measure QoL have been developed, namely the Regional Quality of Living Index, the Living Barometer, and the Sustainable Balance Instrument. The approaches have been developed for different purposes, and as such, also differ in their degrees to which they are grounded in theory and in policy.

An interesting observation in this regard is that the approach that is most strongly grounded in policy (the living barometer) is the least theoretically grounded. For this index, indicator selection was mostly informed by practical reasons, in particular the availability of data over time. This was necessary to use the index to pick up the effects of the wijkaanpak (neighbourhood approach) in the 40 selected neighbourhoods. As discussed in this section, the success of the wijkanpak was reported to be limited, which has been explained by setting too ambitious goals, the difficulty in aligning relevant stakeholders and the fact that the financial support that was terminated earlier than expected. Adding to this list of reasons -based on the comparison of the living barometer and our TQoL framework- it may be argued that the living barometer also misses relevant components of QoL and, as such, was not able to pick up relevant changes in QoL, in particular related to the life maintenance and life flourishing dimensions. Hence, an interesting trade-off becomes apparent. To capture the effects of policies it is necessary that the indicators used to construct the QoL index are available over time, but such indicators (at least in the case of the Netherlands) are generally related to the QoL enablers (basic functions) as opposed to the higher-order dimensions. While the Regional Quality of Living Index and the Sustainable Balance Instrument do cover these dimensions of the TQoL framework, their availability over time is more limited compared to the living barometer.

This case study was specifically focused on analysing and understanding the effects of declining and ageing population levels on Quality of Life. To assess this regression models have been estimated using the dimensions of the (theoretically grounded) Sustainable Balance Instrument as dependent variables. The results show that population decline and aging significantly negative influence the social-cultural and economic dimensions of QoL, but do not (negatively) affect the ecological one. It is important that Dutch municipalities that face these conditions realise that such developments indeed put pressure on QoL.

Finally, the latent class analysis reveals that various distinct Quality of Life patterns may underlie similar composite QoL scores. Some patterns are quite straightforward. For example, municipalities scoring average on all dimensions (class 1), above average on all dimensions (class 2), or below average on all dimensions (class 2). Yet, other classes are quite distinct, for example, municipalities scoring particularly well on the economic dimension, but poorly on the ecological one (class 4) and vice-versa municipalities scoring particularly well on the ecological dimension, but poorly on the economic one. Obviously, understanding such underlying qualitative differences is very important to policy makers aiming to increase Quality of Life in their respective municipalities.

6 Recommendations

6.1 How the QoL concept and indicators could be further developed in the region

One of the main findings of this case study is that the QoL index that is most strongly grounded in policy (the living barometer) is least ground in theory. Compared to our TQoL framework it lacks indicators related to the life flourishing and life maintenance dimensions and also lacks subjective indicators. As such, it is likely that it will not pick up relevant effects of policy efforts to increase QoL.

The reason that the index lacks these indicators is that indicator selection was driven by the criterion that data would be available over time. This is obviously an important criterion if the desire is that assess the effects of policy, yet it goes against the need to have a comprehensive index. This points to the need to have measurements related to the life maintenance and life flourishing dimensions, as well as subjective measurements (via large-scale surveys) for prolonged periods. Only then can an index be developed that is both comprehensive and can be used to assess policy effects over time.

6.2 How the QoL concept of this ESPON project can be improved and enriched

The cluster analysis reveals that certain aggregate QoL scores may arise from different underlying patterns. Only by revealing these patterns is it possible to find the underlying reasons for low (or high) levels of QoL, which may provide concrete handles for policy to effectively increase QoL. Moreover, the latent class clustering can be used to assess the drivers of the QoL patterns. In the present case, it was found that especially small regions that experience population decline are likely to fall into a cluster with low scores on the economic and social-cultural dimensions. Hence, the method provides an integrated and comprehensive approach to study and better understand Quality of Life of European regions.

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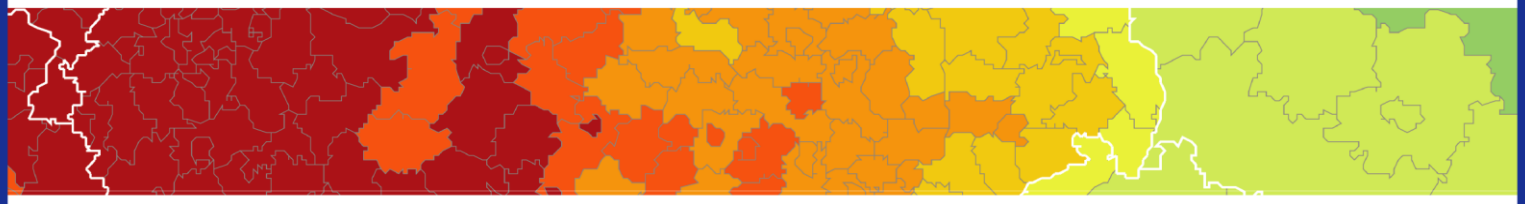

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