

# ESPON QoL – Quality of Life Measurements and Methodology

Annex 9 to the Final Report  
Case study: Luxembourg

Applied Research

**Final Report**

**30<sup>th</sup> October 2020**

# Final Report

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## Project team

Carlo Sessa, Giorgia Galvini, Institute of Studies for the Integration of Systems – ISINNOVA (Italy)  
Oriol Bioscal, Harold del Castillo, MCRIT (Spain)  
Herta Tödting-Schönhofer, Alina Schönhofer, Metis (Austria)  
Daniel Rauhut, Teemu Makkonen, University of Eastern Finland – UEF (Finland)  
Maarten Kroesen, TUDelft (Netherlands)

## Author of the case study

Dr Thomas Stumm, EureConsult (Luxembourg)

## Project Support Team

Sabine Stölb  
LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG  
Ministère de l'Énergie et de l'Aménagement du territoire  
Département de l'aménagement du territoire

Janja Pečar  
REPUBLIKA SLOVENIJA  
URAD RS ZA MAKROEKONOMSKE ANALIZE IN RAZVOJ

Anna Lea Gestsdóttir  
Byggðastofnun  
Icelandic Regional Development Institute

## ESPON EGTC:

Project Expert: Sandra Di Biaggio

Financial Expert: Caroline Clause

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Contact: [info@espon.eu](mailto:info@espon.eu)

## **Annex 9 to the Final Report**

### **Case Study 06:**

# Luxembourg

## ESPON QoL – Quality of Life Measurements and Methodology

30<sup>th</sup> October 2020

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This document is an Annex to the final report.

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

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## Abbreviations

CES	Economic and Social Council (Luxembourg)
CPS	Cross-border public services
CSSD	Higher Council for Sustainable Development (Luxembourg)
EU	European Union
GDP	Gross domestic product
LAU	Local Administrative Unit
LIW	Luxembourg Index of Well-being
LISER	Luxembourg Institute of Socio-Economic Research
NUTS	Nomenclature des unités territoriales statistiques (Nomenclature of Territorial Units for Statistics)
OECD	Organisation for Economic Co-operation and Development
ODC	Observatory of Competitiveness (Luxembourg)
QoL	Quality of Life
STATEC	Luxembourg national statistical office
TQoL	Territorial Quality of Life
USD	US Dollar
WHO	World Health Organization

# 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.

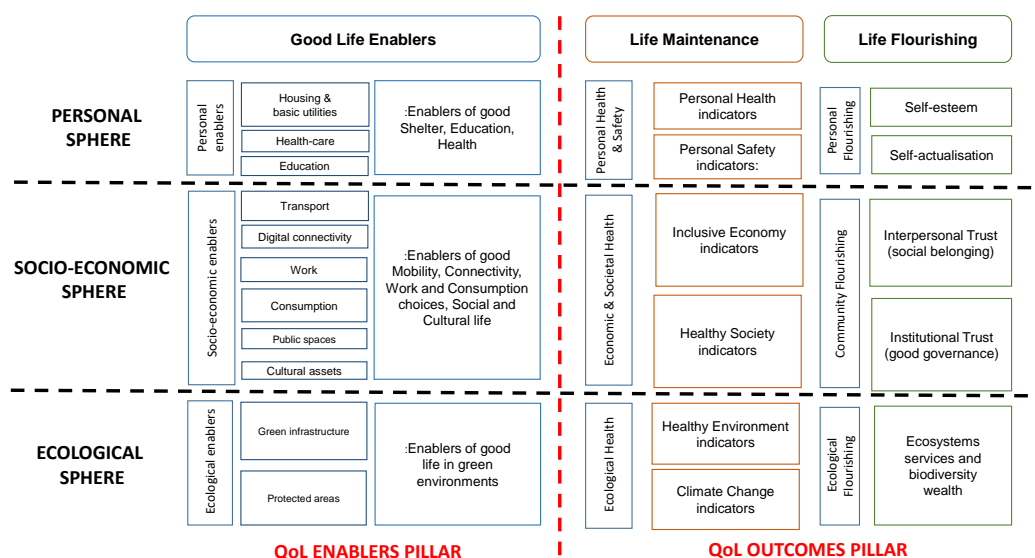
Each case study provides examples of application of the concept of quality of life (QoL) in a specific region. This complements the conceptual model and the research done at European level. The reasons why this region has been chosen forms part of Section 1.

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	
	Ecological enablers	Cultural Assets	
		Green infrastructure	
Life Maintenance	Personal Health and Safety	Protected areas	
		Personal health indicators	
	Economic and Societal Health	Personal safety indicators	
		Inclusive economy indicators	
	Ecological Health	Healthy Society indicators	
		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 region

The Grand Duchy of Luxembourg is a small landlocked country in Western Europe, bordered by Belgium (to the west and north), Germany (to the east) and France (to the south). The roots of the Grand Duchy are stretching back to the 10th century and its history was always closely intertwined with that of the three neighbouring countries<sup>1</sup>. This historic legacy is also reflected in the country's linguistic settings, as three languages are today recognised as official in Luxembourg: Luxembourgish (national language) as well as German and French (languages of administration).

The Grand Duchy of Luxembourg is the second-smallest EU Member State (total area: 2,586 km<sup>2</sup>) and classified by Eurostat as NUTS 1 area (LU0). Luxembourg has land borders with a total length of 356 km. Around 80% of these borders are shared with Belgium (148 km) and Germany (135 km), while the remaining 20% concern France (73 km). A historically rooted and Europe-wide unique feature is that almost the entire German-Luxembourg border forms a “Common German-Luxembourg territory” (*Gemeinschaftliches deutsch-luxemburgisches Hoheitsgebiet*). It follows the river system Our-Sauer-Mosel at a length of 128 km and is jointly administered by both countries<sup>2</sup>.

In ESPON regional typologies, Luxembourg is considered an urban-rural cross-border area that forms with its surroundings a “poly-nuclear cross-border metropolitan area”. The latter includes Luxembourg City as functional urban area as well as other close-by cities or secondary centres located in the neighbouring border regions of Germany, Belgium and France. This cross-border metropolitan area forms part of the much wider cross-border area named “Greater Region”, in the context of which Luxembourg cooperates closely since decades with the regions Grand Est (France) and Wallonia (Belgium) as well as with the two German Federal States of Rhineland-Palatinate and Saarland.

### Governance system

Luxembourg is a unitary State established as constitutional monarchy (i.e. Grand Duke as Head of State) and as parliamentary democracy, with the latter consisting of a directly elected unicameral Parliament (*Chambre des députés*) and a national government led by a Prime Minister. Luxembourg City is the capital of the Grand Duchy and seat of the national government. Below the national government, one can distinguish two levels of territorial governance<sup>3</sup>.

The first lower level of administrative sub-division in Luxembourg are today the 12 cantons (LU: *Kantonen*, DE: *Kantone*, FR: *Cantons*)<sup>4</sup>, which correspond to the former LAU-1-Level (see: Map

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<sup>1</sup> There have been three Partitions of the historic Grand Duchy of Luxembourg (in 1659, 1815 and 1839), which reduced the territory of Luxembourg from 10,700 km<sup>2</sup> to the present-day territorial size of 2,586 km<sup>2</sup>. With these partitions, larger territories were allocated to France (1659), Prussia (1815) and Belgium (1839).

<sup>2</sup> The bi-national area covers 620 hectares (of which 4 hectares are land area) that are registered under German statistics with the code “Extra-Regio NUTS 3: DEZZZ”. Joint administration implies e.g. that the 30 bridges across these rivers (i.e. railway and road bridges, pedestrian bridges) are jointly maintained by both states.

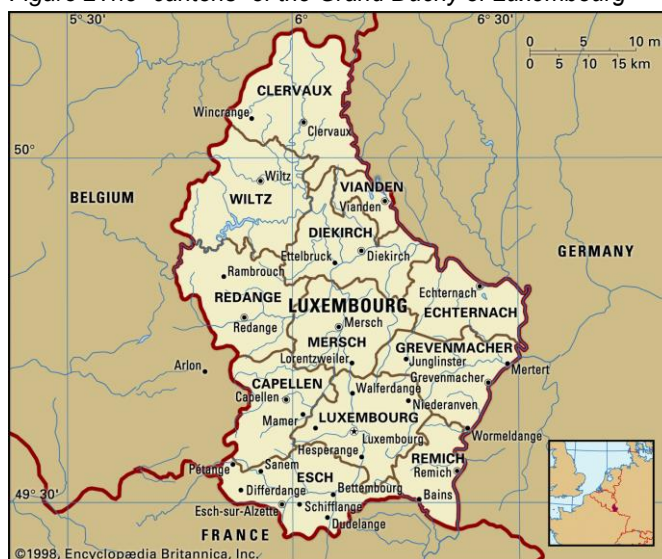
<sup>3</sup> Le Gouvernement du Grand-Duché de Luxembourg (2020a); AER (2020)

<sup>4</sup> Until 2015, the cantons were subdivisions of the three former administrative “Districts” of the Grand Duchy of Luxembourg (Luxembourg, Diekirch and Grevenmacher). On 3rd October 2015, this district level of government was abolished.

1)<sup>5</sup>. However, cantons do not have their own administrative structure and only serve as territorial units for the definition of the four electoral constituencies (south, centre, east and north) and the specification of other administrative matters (e.g. statistical aspects).

The cantons are further divided into 102 municipalities (LU: *Gemengen*; DE: *Gemeinden*; FR: *Communes*), which are the country's lowest administrative division and conform to the LAU 2 level. Municipalities are governed by an elected council and a mayor, with both institutions taking decisions on matters of local interest that fall within the municipalities' general administrative competences. 12 municipalities have been given a separate official status as "town" (LU: *Stad*; DE: *Stadt*; FR: *Ville*).

Figure 2 The "cantons" of the Grand Duchy of Luxembourg



Source: Encyclopædia Britannica (2020)

Despite the statutory difference between communes and towns, the latter are not all contiguous urbanised areas. Some of them are even very small and thus more alike villages than towns<sup>6</sup>.

Aspects highly relevant for the quality of life of Luxembourg's resident population are largely decided by policy making at the national level. However, also the municipalities are in charge of providing a wide range of local government services that directly affect the daily life of citizens. The division of powers between the State and municipalities is defined in the Municipal Organisation Act of 1988, but also further specified in several other laws<sup>7</sup>. Overall, municipal powers are divided into mandatory competences<sup>8</sup> and optional competences<sup>9</sup>.

### Geo-physical conditions and settlement structure

The geo-physical conditions and basic characteristics of natural areas divide Luxembourg's national territory into two main parts (see: Annex 1): The northern part of Luxembourg, known

<sup>5</sup> Since 2017, the LAU 1 level (formerly NUTS level 4) that corresponded to the Luxembourg cantons no longer exists. Only the former LAU 2 level was retained. So, the report refers to this level as LAU.

<sup>6</sup> The registered population of towns ranges from close to 2,000 inhabitants (Town of Vianden) to slightly over 115,000 inhabitants (Luxembourg City)

<sup>7</sup> AER (2020)

<sup>8</sup> This includes the organisation of the municipality and other functions such as education (buildings and school organisation, but not the curricula and pedagogical matters), the municipal road network and traffic management, local planning, water supply and waste management, emergency services, police matters (jointly with the State), public hygiene and health, as well as social welfare.

<sup>9</sup> Optional functions carried out by municipalities include public transport, the management of clinics and hospitals, sporting activities, music education, economic development (e.g. the creation of industrial, commercial and craft areas), tourism and cultural affairs.

as “Oesling” (LU: *Éislek*; DE: *Ösling* or *Islek*; in eastern Belgium *Eeslek*), and the southern part of Luxembourg, known as the “Good Land” (LU: *Guttland*, DE: *Gutland*; FR: *Bon Pays*).

This natural division influenced the settlement structure in Luxembourg for centuries, which primarily developed alongside river valleys and in the (former) industrial areas of the south or at major crossroads. And even today, this north-south division is reflected by the population density at canton level (see: Map 2).

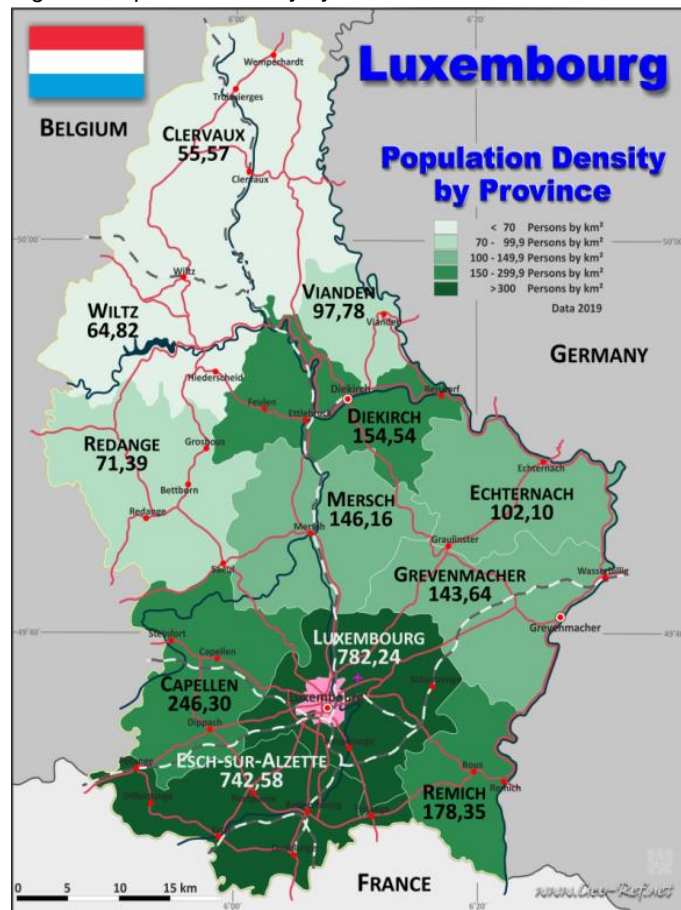
**The “Oesling”** covers around one third of the national territory in the North of Luxembourg and is a forested, rural highland region averaging 450 metres in elevation. It is incised by deep valleys of a river network organised around the River Sûre (or Sauer), that first runs eastward through north-central Luxembourg, then becomes the border river with Germany in the East and finally flows into the Moselle River further southwards at the municipality of Wasserbillig<sup>10</sup>.

Larger parts of the Oesling are sparsely populated (< 70 inhabitants per km<sup>2</sup>) and people are living either in very small rural villages or in a few “larger” municipalities that are functional centres in the two north-western administrative cantons of Wiltz and Clervaux. Only in the south-eastern part of the Oesling, population density is close to or over a value of 100 inhabitants per km<sup>2</sup> (i.e. canton Vianden, norther part of the canton Diekirch).

The **“Good Land”** covers around two-thirds of the Luxembourg national territory. This larger zone has a more varied topography and an average elevation of about 245 metres. The south-central part of the Good Land is structured by the northward-flowing Alzette River, at which the capital city Luxembourg and also several other towns (e.g. Esch-sur-Alzette and Bettembourg in the South; Mersch and, Ettelbrück in the North) are located<sup>11</sup>.

With the exception of the canton Redange, all other parts of the Good Land are more densely populated (>100 inhabitants per km<sup>2</sup>). National “density peaks” are reached in the heavily urbanised cantons of Luxembourg and Esch-sur-Alzette, where also a major part of the Grand Duchy’s economic activities is concentrated.

Figure 3 Population density by “cantons” in 2019



Source: Geo-Ref.net (<http://www.geo-ref.net/en/lux.htm>)

<sup>10</sup> Encyclopaedia Britannica (2020)

<sup>11</sup> Encyclopaedia Britannica (2020)

However, population density at the municipal level (see: Annex 2) also reveals quite strong variations between urban, periurban and rural areas especially in the central-southern parts of Luxembourg.

Based on the currently prevailing morphological features (e.g. density and continuity of the built environment) and functional features (e.g. commuter flows within Luxembourg), three large urban poles can be identified in the Grand Duchy: the monocentric agglomeration of the City of Luxembourg as well as two polycentric agglomerations, one to the south in the old mining basin (including the towns of Esch-sur-Alzette, Differdange and Dudelange) and the other to the north around Diekirch and Ettelbrück, including also other municipalities (i.e. “*Nordstad*”)<sup>12</sup>.

Nevertheless, settlement development within Luxembourg is becoming increasingly complex as more and more residential homes are constructed in rural areas. This is because peoples' choices of residence are highly influenced by real estate prices and rental costs. Although the latter are steadily increasing across the country, prices and costs are still lower in rural areas more distant from the major employment areas around the City of Luxembourg and Esch-Belval. The medium-term growth trend was particularly vigorous in the City of Luxembourg and close-by municipalities situated in the inner “suburban ring” (i.e. sometimes with price increases by more than 50% of the value of properties). This causes a phenomenon of socio-residential segregation in the agglomeration of the capital city, where modest and even average social categories are excluded from home ownership and increasingly also from rental. This has many consequences, in particular with regard to social mix in a school environment, where living together is built in its diversity and mutual enrichment<sup>13</sup>.

The still pronounced north-south settlement pattern as well as the (social) effects of rising real estate and housing costs may imply that people perceive the notion and content of quality of life very differently, depending on whether they can afford living in the more urbanised areas of central-southern Luxembourg or whether they have to “escape” to the more far-away rural areas.

### **Socio-economic features**

The Grand Duchy's prosperity was formerly based on steel manufacturing. Since the decline of that industry, and in order to avoid risks emerging from an economy highly dependent on a single sector, Luxembourg authorities pursued a policy of diversification of the national economic fabric through a strategy of multi-sector specialisation. Luxembourg actively promoted economic sectors such as information and communication technologies (ICT), logistics, life sciences and clean-tech, research, as well as the space industry and the shipping sector. Today, Luxembourg is also known as the world's second largest investment fund centre (after the United States) as well as the most important private banking centre in the Eurozone. More recently, Luxembourg also succeeded to attract Internet start-ups and major international Internet companies (e.g. Skype, Amazon), with some of them having shifted their regional headquarters to the Grand Duchy<sup>14</sup>.

The result of the country's adaptability is a very high standard of living, with Luxembourg holding the second position in the World Bank's 2018 country ranking for the per capita gross domestic product at purchasing power parity (113,337 USD)<sup>15</sup>. As regards quality of life, however, previous studies conducted at the international level provide a different, more nuanced picture.

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<sup>12</sup> STATEC (2019), p.6

<sup>13</sup> Decoville / Feltgen (2018), pp. 52-56

<sup>14</sup> Le Gouvernement du Grand-Duché de Luxembourg (2020b)

<sup>15</sup> World Bank (2020)

For example, the OECD Better Life Index ranks Luxembourg in the 9th position out of 27 European countries.

Luxembourg's labour market is characterised by strong spatial-functional relations with the adjacent regions in France (Grand Est region), Belgium (Walloon region) and Germany (Rhineland-Palatinate, Saarland). In 2019, around 201,000 people commuted every day from the surrounding border areas to their workplaces in different parts of Luxembourg. Cross-border workers account for around 46% of the total employment in Luxembourg. Most commuters are coming from France (105,866) and with nearly equal but lower proportions from Belgium (47,518) and Germany (47,531)<sup>16</sup>.

This makes the labour market of Luxembourg very unusual, as cross-border workers have long since become a decisive factor in various economic sectors (i.e. high levels of employment of cross-border workers) and thereby ensure and continue to support the dynamic development of the Grand Duchy's economy (see also: Annex 3).

### **Socio-cultural features**

Luxembourg has a pronounced multicultural social context that can be perceived best by taking a closer look at the composition of its total resident population<sup>17</sup>. Out of the currently 613,894 inhabitants (January 2019), “only” around 53% are Luxembourgish (i.e. Luxembourgish-origin population and resident population with foreign roots having adopted Luxembourg nationality). The remainder 47% covers the foreign resident population without Luxembourgish nationality, composed of persons originating from Portugal (33%), France (16%), Italy (around 8%), Belgium (around 7%) and Germany (around 5%) as well as from other EU countries (around 16%) and non-EU countries (15%).

This multicultural context implies that the notion and content of quality of life may be perceived very differently by the various population groups within Luxembourg, depending on their cultural backgrounds and socialisation processes (i.e. basic and higher education, professional advancement) as well as on their society positioning within Luxembourg (e.g. sector of employment and income levels; quality of the residential neighbourhood and of the immediate housing situation etc.).

The pronounced multicultural context of Luxembourg's society is significantly enhanced by the daily presence of cross-border workers from the immediate neighbouring border regions in Germany, France and Belgium. The in-flow of cross-border workers corresponds in 2019 to around one third of Luxembourg's total population, with these workers being “visible” to the Luxembourg residents in almost all areas of everyday life (i.e. shopping, leisure, work, health care and long-term care services etc.).

Already a while ago, empirical social research revealed that this strong presence of commuters has also variable effects on society-wide discourses within Luxembourg<sup>18</sup>. Results indicate a certain ambivalent representation, as the Luxembourg resident population generally perceives cross-border commuters by ways of “differentness” and “familiarity” both in socio-economic and socio-cultural terms as well as with positive and negative perceptions<sup>19</sup>. Within different

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<sup>16</sup> STATEC (2020b)

<sup>17</sup> STATEC (2020a)

<sup>18</sup> Wille (2011)

<sup>19</sup> Positive perception: commuters are a necessity for the Luxembourgish economy (87%); commuters are enriching the country's culture (55%). Negative: commuters are competitors on the labour market (34%); commuters threaten the Luxembourgish language being one of the most important factors for national identity (57%).

population strata, however, there are also strong variations between positive and negative perceptions.

## 1.2 Rationale for selecting the case study

The Luxembourg case study examines the county-wide measuring of well-being and quality of life through the national-level project "PIBien-être" and the related "Luxembourg Index of Well-being" (LIW).

Luxembourg was selected as case study to explore how the national LIW-concept could possibly also take into consideration the country's pronounced cross-border dimension. The case study can therefore give new insights into how the national perception of quality of life should be re-interpreted (or even re-conceived) under such particular conditions.

More specifically, and different to the core issue explored by other case studies of the ESPON QoL-project (i.e. possible development of a citizen centred approach), the Luxembourg case analyses the currently used LIW-indicator framework with a view to introducing a "cross-border dimension to quality of life" (see: section 4.3). The case study also explores possible indicators and data sources (e.g. survey, individualised data etc.) that could be used for measuring this cross-border dimension of quality of life (see: section 4.4).

The analysis complements the Territorial Quality of Life (TQoL) approach developed by the ESPON QoL-project, since exploring a cross-border dimension to quality of life might also be interesting for other cooperation areas located at the internal or external borders of Europe. This is particularly relevant for cross-border metropolitan regions<sup>20</sup> where all kinds of social and economic exchange relations across borders have increasingly become intertwined over the past decades.

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<sup>20</sup> Some examples with intense and wide-ranging cross-border exchange relations (e.g. commuting, delivery of goods and services, healthcare, shopping etc.) are the Eurodistrikt Lille-Kortrijk-Tournai (BE-FR), the Euregio Maas-Rhein (DE-BE-NL), the Upper Rhine Area (DE-FR-CH), the Öresund Region (DK-SE), the Geneva cross-border metropolitan area (FR-CH), the Alpenrhein-Bodensee-Hochrhein area (DE-AT-CH-LI), the "EuRegio Salzburg-Berchtesgadener Land-Traunstein" (DE-AT) or the greater Bratislava-Vienna area (AT-SK).

## 2 Policy context

### 2.1 Outline of the QoL concept

This case study looks in particular at the “Luxembourg Index of Well-being” (LIW) in its version of 2018<sup>21</sup>, which is the key outcome of a government-initiated national project called “PIBien-être” that aims at monitoring well-being and quality of life in Luxembourg.

The LIW measures quality of life at a country-wide scale (NUTS 1 - LU0). A further differentiation of the LIW at the two levels of local government in Luxembourg (LAU 1: “cantons”; LAU 2: “municipalities”) does not exist.

The main player behind the national-level “PIBien-être” project, and thus also the design of LIW, is a joint commission comprising two advisory institutions of the Luxembourg national government: the “Economic and Social Council” (CES)<sup>22</sup> and the “Higher Council for Sustainable Development” (CSDD)<sup>23</sup>. The joint CES-CSDD commission is supported in its activities by the “Observatory of Competitiveness” (ODC)<sup>24</sup> and the Luxembourg national statistical office (STATEC).

Table 2 Overview of policy context

Actor/institution	Policy context	Description of indicators and data used	Activities and processes
CES-CSDD Joint Commission, supported by the ODC and STATEC	Nation-wide	National-level project “PIBien-être”, which has identified 63 indicators for 11 domains of life of the population, and the “Luxembourg Index of Well-being” (LIW), which uses a larger part of these 63 indicators (for data used, see also le 3).	Selection and design of the 63 indicators as well as data gathering and data computing for both, the “PIBien-être” project and the LIW.

### 2.2 Evolution of the QoL approach

The initiative to introduce a monitoring of quality of life in the Grand Duchy dates back to July 2009, when the former Luxembourg Prime Minister Jean-Claude Juncker presented the 2009 government programme to the Chamber of Deputies. The programme stated that, together with the CSDD and the CES, the ODC shall develop a “composite indicator” of well-being beyond

<sup>21</sup> STATEC (2018)

<sup>22</sup> The CES (Conseil économique et social) of the Grand Duchy of Luxembourg is the permanent consultative institution of the Government in matters of economic and social orientation of the country. The CES is the central and permanent tripartite think-tank for social dialogue and socio-professional consultation at national level

<sup>23</sup> The CSDD (Conseil supérieur pour un développement durable) acts as a discussion forum on sustainable development. It initiates research and studies in all areas related to sustainable development. It also engenders the broadest participation of public and private bodies as well as citizens. Finally, it issues opinions on any measures relating to the national sustainable development policy taken or envisaged by the Government, as well as on the implementation of Luxembourg's international commitments for sustainable development.

<sup>24</sup> The ODC (Observatoire de la Compétitivité) has the role of helping the government and the social partners to define the orientations and content of policies that are favourable and compatible with long-term competitiveness, a source of growth and well-being. The ODC is, in this case, a monitoring and analysis unit of the evolution of the competitive position of the Grand Duchy of Luxembourg in charge of investigating cases, monitoring them and generating support through designated partners.



the traditional indicator GDP per capita for measuring the progress of society and well-being from a long-term perspective. This indicator shall be implemented based on the statistics and official databases provided by STATEC<sup>25</sup>.

Already in July 2009, a Joint Group composed of members of the CSDD and CES was set up to develop concepts and an analytical framework as well as information reflecting the concerns of citizens, which would enable to guide further choices and actions of the relevant authorities. This Group was supported methodologically and statistically by the ODC and STATEC<sup>26</sup>.

Based on this practical division of roles, the letter of referral of the Prime Minister of April 2010 has adapted the initial task allocation and also changed the very nature of the measuring tool to be developed. The Government decided to mandate the CSDD and the CES with producing and proposing a “system of well-being indicators” and also asked both Councils to produce a joint report. To this end, they may have recourse to the expertise of the ODC and to the databases of STATEC<sup>27</sup>.

In response to this letter of referral, the Joint Group of the CES and CSDD monitored and steered the further work process by setting up a “technical group”. This technical group was in charge of organising a series of seminars and workshops to ensure a broad consultation of the civil society (i.e. between March and November 2010)<sup>28</sup> and also of preparing a technical report that was published in May 2011. This technical report served as a basis for further debates and discussions within both Councils, with each of them examining the report separately while formulating comments and issuing opinions<sup>29</sup>.

In the following, both Councils worked together for producing the joint report that had to be submitted to the Luxembourg Government. In 2013, the joint CES-CSSD commission presented its conclusions on monitoring the quality of life in Luxembourg, which were summarised in a joint opinion entitled "*Projet PIBien-être*". This document gave birth to the “PIBien-être” project and proposed 63 indicators belonging to 11 thematic domains for measuring the quality of life in Luxembourg<sup>30</sup>.

In 2015, within the "PIBien-être" project, STATEC presented a preliminary analysis of the LIW. The results were published by STATEC in its “Work and social cohesion report” of 2016<sup>31</sup>. The report observed that the data-base informing the “PIBien-être” project was complete and that, in general, the LIW was performing well as a compass to browse the large amount of data collected.

Following this first publication, the analysis of data and quality checks of indicators were continued. A first draft version of the final report on the project "PIBien-être" / the LIW was released in 2017<sup>32</sup> and re-published in a final version in early 2018<sup>33</sup>.

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<sup>25</sup> CES (2020)

<sup>26</sup> CES (2020)

<sup>27</sup> CES / CSDD (2013), p. 1

<sup>28</sup> Two seminars and three workshops around the themes “GDP reform”, “Quality of life” and “Sustainability”, which gave the opportunity to citizens, scientists and representatives of associations to express their concerns about quality of life or their societal expectations. The proposals made and the lessons learned at the end of this consultation were also incorporated into the joint report that the CES and the CSDD had to prepare for the attention of the Government. See: CES (2020)

<sup>29</sup> CES / CSDD (2011), pp. 7-12

<sup>30</sup> CES / CSDD (2013)

<sup>31</sup> STATEC (2016), pp. 144-171

<sup>32</sup> STATEC (2017)

<sup>33</sup> STATEC (2018)

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

The previous section on the initiation and conceptualisation phase of the "PIBien-être" project (2009-2017) clearly shows the strong linkage of the LIW with national-level policy-making in Luxembourg.

These linkages have become operational after the Luxembourg parliamentary elections of 14th of October 2018 and the following coalition negotiations, which led to the formation of a new government. The concluded coalition agreement provides that the (...) *qualitative economic development will be captured by the "PIBien-être", which will be published on a regular basis to give a holistic view of the situation in the country. This indicator supplements that of gross domestic product (GDP) to give the Government an additional tool for guiding and evaluating its policies*<sup>34</sup>.

Since then, STATEC is responsible for the "PIBien-être" project / the LIW and its future development. A new public report on the "PIBien-être" is currently prepared by STATEC, which will be addressed to all stakeholders including the Government, the Chamber of Deputies and the CES / CSDD. As STATEC also plans an annual updating of the LIW, the "PIBien-être" indicators are currently reviewed in close collaboration with the joint CES / CSDD commission (see also: section 2.5 below)<sup>35</sup>.

Due to the official character of the "PIBien-être" project and the direct involvement of advisory institutions of the Luxembourg government, quality of life has become a key objective of national policy making. In particular the LIW is supposed to inform national-level policy decisions and their prior discussion by the elected representatives in the national Parliament.

This can be illustrated by a recent debate on quality of life and the "PIBien-être" project within the Luxembourg national parliament, which took place at the public sessions on 21st of January and on 6th of February 2020. Across all political parties represented in the Chamber of Deputies, there was consensus that the "PIBien-être" should be used to record the Luxembourg population's satisfaction with its living conditions. During this debate, the Minister for Economy (Franz Fayot) stressed in the name of the national government that the LIW is considered a key element for building a sustainable economy in Luxembourg. Moreover, the Minister announced that he wants to integrate the "PIBien-être" indicators into the national budgetary procedure and into the National Reform Plan implemented in the context of the European Semester<sup>36</sup>.

Yet, the LIW is measuring quality of life only at the national level and can therefore not be used for informing policy-making at the municipal level. This, however, would be important, as Luxembourg municipalities are providing a wide range of basic public services that directly affect the everyday life of citizens and thus their subjective perception of quality of life.

Moreover, the LIW can also not be used as a tool providing fact-based support for joint cross-border policy making, which involves the Luxembourg government or individual Luxembourg municipalities as well as their respective partners across the national border. This is because the LIW only captures quality of life of the Luxembourg resident population and therefore does not include a "cross-border dimension of quality of life", which would also include the resident populations' exchange relations with adjacent border regions in France, Belgium or Germany. (see: section 4.3 below).

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<sup>34</sup> Interview with STATEC (2020)

<sup>35</sup> Interview with STATEC (2020)

<sup>36</sup> Luxemburger Wort (2020a)

## 2.4 Success factors and obstacles

Important success factors were the high-level political backing (i.e. official mandate by the national Government) and also the well-structured and participatory work process within the “PIBien-être” project. The conceptualisation of the LIW was jointly driven and agreed by various government advisory bodies representing different political, social, economic and environmental interests in Luxembourg (CSDD, CES), complemented by a broad consultation of the civil society (seminars and workshops) and actively supported by the technical competence and (data) resources available within the national administration (ODC, STATEC).

Already during the finalisation phase of the “PIBien-être” project, STATEC highlighted some challenges and weaknesses that were observed when conceptualising the LIW<sup>37</sup>:

- Challenges related to data processing (How to organise a large data-base to extract relevant information? How to handle data relating to different statistical units?) and to the comparability of indicators (How to integrate indicators that are observed every year with indicators that are more seldom observed?). The latter aspect was particularly relevant for the set-up of the LIW, as it required figures with complete time-series so that its indicators could be normalised and aggregated. This also implied that variables of the “PIBien-être” project without complete time-series had to be excluded from the LIW (see: section 3.1).
- An intrinsic weakness, shared with all the other dashboards of indicators of quality of life, is that the “PIBien-être” project and the LIW use secondary data. This means that both elements cannot inform about the latest month or the latest year for each of its indicators. Some indicator sub-sets of the 11 thematic domains can be updated more frequently (e.g. those related to the working conditions), while other sub-sets of indicators are less frequently observed (e.g. indicators on social relationships or on housing conditions). This poses a problem that is particularly difficult to solve, as it implies a trade-off between completeness of the domains and timeliness of the information.

STATEC explored possible solutions for overcoming problems linked to the timeliness of all statistical sources (i.e. the publication of regular complete reports) and for minimising the delay between data collection and a dissemination of results (i.e. the publication of more frequent reports).

The selected alternative was to develop a set of short-term indicators that could help monitoring people’s well-being by using high frequency data. For producing more up-dated results, (...) *STATEC developed a model to predict well-being using statistical techniques, and business and consumer survey data. Our forecasts indicate that, between 2015 and 2016, the proportion of people satisfied with their lives is expected to decrease by 1.5 percentage points, from 42% of the respondents to 40.5%.*<sup>38</sup>

## 2.5 Achievements and further plans

A report on the “PIBien-être” and the LIW was until now only published once in 2018. However, a new report on quality of life in Luxembourg is currently prepared by STATEC and also the indicators will be reviewed in this context.

### ***Added value of the “PIBien-être” project and the LIW***

The first “PIBien-être” report allowed the Luxembourg government to follow statistically the complex and multifaceted concept of quality of life, and to identify related policy areas that

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<sup>37</sup> STATEC (2016), p. 167

<sup>38</sup> STATEC (2018), p. 4

require action or further investigation. Within this context, the LIW is primarily a “compass” that allows navigating the vast amount of relevant information. Moreover, the LIW can be directly compared with prominent indicators of welfare such as Gross Domestic Product (GDP)<sup>39</sup>.

The LIW summarises the information from the “PIBien-être” project in a single index to provide an encompassing assessment of quality of life in Luxembourg. In short, the overall message for the observation period 2009-2015 is that the quality of life in Luxembourg has not improved. (...) *The decomposition of the LIW by its domains allows us to explain in more detail this stagnation. Some domains have upward trends, thus pointing to improving conditions for quality of life. This set of domains includes: Environment, which improves by nearly 13%, Education and skills (+1.5%), Income and wealth (+10%), frequency of social contacts (+1.5%), and work-life balance (+1.5%). The remaining domains have declining trends, thus suggesting worsening conditions. Such domains are: Housing, which declines by 6%, Health (-10%), Personal security (-10%), Governance (-6%), Employment (-3.5%), and Subjective well-being (-2.5%)*<sup>40</sup>.

### **Future developments**

Since the publication of the first “PIBien-être” report in 2018, the Luxembourg national government has mandated STATEC to prepare a regular and more frequent publication of the LIW (even yearly).

STATEC is currently working on a new “PIBien-être” report, which also involves a substantial review of the “PIBien-être” / LIW indicators that is done in concert with the joint CES / CSDD commission. Within STATEC, it is the “Living Conditions” unit of the “Social Statistics” division that is in charge of this process, but also other STATEC divisions or units are contributing to the work (i.e. National Accounting, Communication, and STATEC Research). Project managers of STATEC are for the moment only reporting to the direction of STATEC, but the finalised report will again be made public in its entirety at a later stage<sup>41</sup>.

The future “PIBien-être” (including the LIW) will refocus on a reduced list of relevant indicators that can be made available annually. A main challenge for the LIW, more particularly, is the calculation methodology, which involves the following questions to be addressed<sup>42</sup>:

- Should the option of not weighing be further continued or should weights be calculated in the future?
- What weights have had to be applied: contributions of the indicators from a factor analysis, coefficients of the indicators from a regression or weight determined by the population?
- Which normalisation method has to be applied, min-max or growth rate?
- What aggregation method has to be applied, arithmetic or geometric mean?

An important driver behind this process is also the Luxembourg national parliament, which recently discussed quality of life and the “PIBien-être” project in the plenary sessions of January / February 2020<sup>43</sup>. At the end of these debates, three motions were adopted unanimously by the deputies: they focus in particular on the means necessary to be implemented by the Government, on access to data with a particular emphasis on administrative data, as well as on the regularity and timeliness of the availability of indicators<sup>44</sup>.

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<sup>39</sup> STATEC (2018), pp. 4, 178

<sup>40</sup> STATEC (2018), pp. 180-181, 194

<sup>41</sup> Interview with STATEC (2020)

<sup>42</sup> Interview with STATEC (2020)

<sup>43</sup> Luxemburger Wort (2020a)

<sup>44</sup> Interview with STATEC (2020)

Therefore, while STATEC continues to “produce” figures for the dashboard of indicators of the “PIBien-être” / LIW and makes them available to the public, the future political use of these figures on quality of life in Luxembourg will be an issue that the relevant political decision-makers are primarily responsible for<sup>45</sup>.

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<sup>45</sup> Interview with STATEC (2020)

## 3 Measuring Quality of Life

### 3.1 Indicators and measurement

At the very beginning of the national-level “PIBien-être” project back in 2009/2010, it was still not fully clear whether the forthcoming work process should lead to the construction of a “synthetic indicator” for measuring well-being in Luxembourg (i.e. option mentioned in the 2009 government programme) or whether a “system of well-being indicators” should be produced (i.e. option mentioned in the Prime minister’s letter of referral of April 2010).

In the following work process, however, the joint CES-CSDD commission was of the opinion that the indicator-scoreboard should be presented in its detailed form in order to reflect the multiple dimensions that measure well-being. The joint commission thus explicitly avoided using any sort of composite indicator that would synthesise the proposed 63 indicators. Instead, it followed the example of the Canadian Statistical Office who computes an index of well-being that is directly related to the monitored indicators and domains. For the LIW, this implies that it is always possible to “decompose” the index to go back to the changes happening in its indicators<sup>46</sup>.

Overall, the “PIBien-être” project fits in the group of initiatives that tries to complement GDP with other measures to compose a dashboard of indicators of quality of life. The 2018 version of the LIW is a synthetic index aimed at capturing the quality of life of the Luxembourg resident population.

#### **Scope and nature of indicators used by the “PIBien-être” project**

The final report of the “PIBien-être” project<sup>47</sup> identified 63 indicators that are distributed across 11 thematic domains (see: Table 3 and also Annex 4): “Income and wealth” (indicators 1-11), “Occupation” (indicators 12-18), “Housing” (indicators 19-23), “Health” (indicators 24-31), “Work-life balance” (indicators 32-37), “Education and skills” (indicators 38-41), “Social Relationship” (indicators 42-45), “Governance and Civil Engagement” (indicators 46-51), “Environment” (indicators 52-60), “Personal security” (indicators 61-62) and “Subjective well-being” (indicator 63).

*Table 3 General overview on indicators used by the “PIBien-être” project*

<b>Indicators</b>	<b>Data used</b>	<b>Type of indicator</b>	<b>Time scale</b>	<b>Territorial level</b>
63 indicators that are distributed across 11 thematic domains, see: Annex 4.	See section 3.2 and Annex 4.	Objective and subjective indicators, see Annex 4.	In general, 2009-2015. Sometimes also for 2009-2013 or 2009-2014 or for individual years within the reference period.	National

The “PIBien-être” project and the LIW integrate objective information about how people behave and figures about people’s perceptions of their own conditions. The database thus includes many objective indicators (e.g. on income and wealth, occupation, housing, health, education, and environment domains)<sup>48</sup>, while subjective indicators mainly cover the domains reporting on

<sup>46</sup> CES / CSDD (2013); STATEC (2018), p.177

<sup>47</sup> STATEC (2018)

<sup>48</sup> Examples are the GNI, the GINI index, the men-women wage gap, the unemployment rate, and the suicide rate.

well-being, work-life balance, social relationship and governance or civic engagement<sup>49</sup>. A drawback in the use of subjective indicators is that, usually, the time series availability for this data is limited (i.e. in the LIW, information on people perceptions comes, with the exception of indicator 63 “life satisfaction”, from the 2013 Eurobarometer rotating module of EU-SILC that is administered every five years)<sup>50</sup>.

All indicators are defined and measured at the national level. Due to this, data can be disaggregated neither for lower territorial administrative levels of Luxembourg (e.gat LAU level: “municipalities”) nor for functional areas within the national territory.

### Measuring quality of life with the LIW<sup>51</sup>

The 2018 edition of the LIW compares quality of life in 2015 to quality of life in the reference year 2009 (i.e. first year of observation for LIW). The general approach of fixing a reference point has the advantage that later on it will also be possible to measure and assess future changes (i.e. evolution beyond 2015).

Not all of the 63 indicators listed in the “PIBien-être” project report are used by the LIW for measuring quality of life in Luxembourg. The LIW only includes indicators for which a consistent time-series was available for the measuring period 2009-2015. For 12 out of the 63 indicators no complete series were available, but these indicators have been interpolated to widen the set of LIW-indicators<sup>52</sup>.

Nevertheless, a larger number of the originally identified indicators under the different thematic domains had to be excluded from the LIW. The non-availability of adequate time-series was the most frequent reason for this exclusion, but also other considerations have played a role (see: Table 4).

Table 4 Indicators from different thematic domains not included in the LIW of 2018

Domain	Indicators
Income and wealth	(4) Yearly growth rates of gross household income / net available household income / net adjusted available household income, because levels of the same variables were already included; (5) “Household total consumption, marketed goods and non-marketed goods”; (7) “Inter-quintile ratio”; (9) “Risk of poverty before social transfers”;
Occupation	(13) “Long-term unemployment rate”, for Eurostat definition and CES-CSDD definition; (17) “Non-fatal accidents at work” and “Fatal accidents at work”;
Housing	(22) “Number of new dwellings”, because they were already included in another indicator and both are correlating at 99%;
Health	(24) “Life expectancy” at different ages and “Life expectancy in good conditions”, female and male;
Work-life balance	(33) “Leisure and occupation time”; (35) “Time spent commuting”;

<sup>49</sup> Example of subjective indicators in domains such as income, occupation and health are, respectively, feelings of job insecurity, people unable to make ends meet, share of adults declaring to be in good or very good health.

<sup>50</sup> STATEC (2018), p. 172

<sup>51</sup> STATEC (2018), pp. 177-179

<sup>52</sup> Interpolated indicators of the LIW are: (2) Total household wealth; (23) Number of new dwellings; (24) Life expectancy at birth; (25) Prevalence of mental problems; (26) Suicide rate; (27) Death by cause; (28) Consumption of drugs; (40) Reading skills; (45) Frequency of social contacts; (51) Feeling of discrimination; (52) Air pollution; (57) Car use.

Domain	Indicators
	(37) "Satisfaction with work-life balance", employed and non-employed or only employed or only non-employed;
Education and skills	(41) "Civic skills of students"
Social relationships	(42) "Having anyone to discuss with personal matters" / "Possibility to ask for help" / "Trust in others"; (43) "Membership in social, cultural, sport associations"; (44) "Time spent volunteering minutes";
Governance and civic engagement	(46) "Voter turnout", because voting at National elections is mandatory in Luxembourg; (47) "Consultation on rule making"; (48) "Membership in political and civic associations"; (49) "Knowledge of languages"
Environment	(53) "Water pollution", for which only two observations in 2009 and in 2015 were available; (60) "Environmental disease burden"
Personal security	(62) "Feeling of safety: walking alone at night"

In its current set-up, the LIW is basically a weighted average of each normalised indicator. More formally, the LIB is built as follows:

- First, each indicator is normalised and negative indicators are inverted into positive ones. Then, growth rates of each indicator are computed according to a specific formula.
- Second, for each thematic area (or domain) the average of its indexes of indicators is computed.
- Third, the LIW is computed as the weighted average of the indexes of thematic domains.

The LIW assumes that each domain contributes in the same way to quality of life. As this assumption can be regarded as arbitrary, sensitivity and reliability of the LIW was tested. To check the sensitivity of the LIW to different compositions of what matters for quality of life, various versions of the LIW were computed by using different weighting schemes from the OECD Better Life Initiative whose thematic domains are comparable with those used in the "PIBien-être" project. In particular, five different sets of weights based on the following rankings were used: the ranking provided by the average European resident (i.e. any user of the Better Life Initiative who connected from a European domain) as well as the rankings provided by the average French, Belgian, German or Luxembourgian resident. In the latter case, however, the number of people who used the OECD Better Life Index and chose to rank the domains is tiny and can hardly represent all residents of Luxembourg.

Each set of weights has been used to produce a new weighted LIW which was subsequently compared with the unweighted LIW. For further checking the reliability of figures, the trend of the LIW was compared with the weighted LIW using weights from Belgium, Germany and France. Results support the evidence that the ranking of what matters for quality of life has little effect on the LIW.

Overall, the LIW should be strictly regarded as a "compass" to direct the reader's attention towards critical areas of intervention, and to identify the relevant data in the large database.

### 3.2 Data sources for QoL

The 2018 final report on the "PIBien-être" project highlights that data used to compile quality of life indicators are in general heterogeneous with respect to source, unit of analysis, frequency of observations and release calendar.



This is also the case for the LIW, which is only underpinned by national-level raw data originating both from statistical offices (i.e. STATEC and EUROSTAT) and from large statistical surveys on individuals or households that are conducted by different international institutions (e.g. European Central Bank, European Commission, OECD and WHO etc.)<sup>53</sup>. Own surveys are not realised to gather raw data for the LIW. Basic information about the data sources used for the LIW is given below (see: Table 5).

*Table 5 General overview of data sources used for measuring quality of life with the LIW*

<b>Actor / institution</b>	<b>Description of the data source used</b>	<b>Geographical unit</b>	<b>Time series from-to, periodicity</b>	<b>Date source</b>
WHO	WHO database “European Health for All” (HFA-DB)	national	In general, for the reference period 2009-2015.	WHO European Region
OECD	Programme for International Student Assessment (PISA)	national		OECD
EU	“Household Finance and Consumption Survey” (HFCS) “European Union Statistics on Income and Living Conditions” (EU-SILC) “European Union Labour Force Survey” (EU-LFS) EUROSTAT thematic statistics Eurobarometer surveys	national	Sometimes also for 2009-2013 or 2009-2014 or for individual years within the reference period.	EUROSTAT, European Central Bank, Eurobarometer
Luxembourg state	STATEC National administrations (General Inspection of Social Security, Police, Cadastre and Topography Administration)	national		Specific national-level data sets for Luxembourg

If one looks at all indicators of the “PIBien-être” project (see: Annex 4) and focuses only on those indicators actually included in the LIW, raw data in form of time series are coming from the following sources (i.e. a single data set is used per indicator):

- the European Central Bank’s Eurosystem “Household Finance and Consumption Survey” (HFCS 2010 and 2014), used for the LIW-indicator “total household wealth”;
- the “European Union Statistics on Income and Living Conditions” (EU-SILC, 2009-2015), used for a large number of LIW-indicators;
- the “European Union Labour Force Survey” (EU-LFS, 2009-2015), used for a large number of LIW-indicators;
- the WHO database “European Health for All” (HFA-DB, 2009-2013), used for the LIW-indicators “life expectancy at birth”, “prevalence of mental problems”, “suicide rate” and “death by cause”;
- EUROSTAT thematic statistics covering in general the period 2009-2015, used for the LIW-indicators “GNI per capita” and “total accidents at work” as well as for a larger number

<sup>53</sup> STATEC (2018), pp. 170-173, 179

of environmental LIW-indicators such as “air pollution” (2009-2014), “noise”, “recycling rate”, “use of renewable energies”, “car use” (2009-2014) and “organic farming”;

- the OECD's Programme for International Student Assessment (PISA 2009, 2012, 2015), used for the LIW-indicator “reading skills”;
- Eurobarometer surveys, used for the LIW-indicators “confidence in institutions” (2009-2015), “feeling of discrimination” (2009, 2011, 2014) and “life satisfaction” (2009-2015);
- the national statistical office STATEC (2009-2013), used for the LIW-indicator “number of new dwellings”;
- the Luxembourg “General Inspection of Social Security” (IGSS 2009-2014), used for the LIW-indicator “drug consumption”;
- the Luxembourg Police (2009-2015), used for the LIW-indicator “offence rate”;
- the Luxembourg “Cadastre and Topography Administration” (2009-2015), used for the LIW-indicator “land use”.

The most frequently used data sources are the “European Union Statistics on Income and Living Conditions” (EU-SILC) and the “European Union Labour Force Survey” (EU-LFS), followed by EUROSTAT thematic statistics and the WHO database “European Health for All” (HFA-DB).

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

### 4.1 Conceptual model and coding the indicators

The national-level project "PIBien-être" and the related LIW are the first official initiative for measuring well-being and quality of life in the Grand Duchy of Luxembourg. The conceptual framework and the nation-wide analysis of the "PIBien-être" project were largely inspired by numerous European and international works on the subject<sup>54</sup>, with in particular the 12 recommendations of the Stiglitz-Sen-Fitoussi report<sup>55</sup>.

Based on the three dimensions of the Territorial QoL Framework developed under the ESPON project, this section is mapping only those indicators of the "PIBien-être" project that are actually included into the LIW (i.e. not considered are indicators that were excluded for various reasons; see above section 3.1).

The allocation of LIW-indicators was done by observing as much as possible the definitions for domains / sub-domains that are elaborated in the Intermediate Report of the QoL-project (April 2020). The indicator distribution is shown in tables 6 to 8 below and its analysis gives the following results:

- Most LIW indicators can be assigned to the two pillars "Good Life Enablers" and "Life Maintenance", whereas only a small number of indicators relates to the pillar "Life Flourishing".
- Under the pillar "Good Life Enablers", most sub-domains important for the quality of life are not covered by indicators from the LIW<sup>56</sup>. Overall, it is interesting to observe that the non-covered sub-domains often concern policy fields for which local authorities are bearing considerable responsibilities.
- The pillar "Life Maintenance" is covered extensively by the LIW indicators, albeit primarily by objective indicators. The focus is mainly on aspects relating to "Personal Health & Safety" and "Economic & Social Health", whereas "Ecological Health" is less intensively covered.
- The pillar "Life Flourishing" is only covered by three LIW indicators, which nevertheless cover the two sub-domains "Personal Flourishing" and "Community Flourishing".

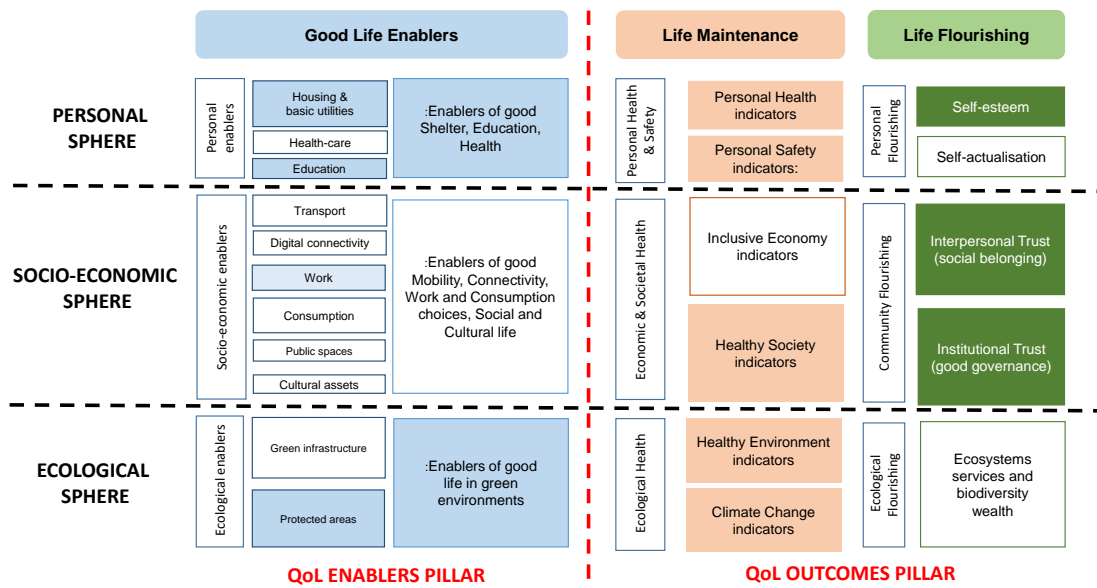
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<sup>54</sup> STATEC (2016), pp. 7-22

<sup>55</sup> CES (2020)

<sup>56</sup> In the table, we introduced a sub-domain on "Income" in order to capture several LIW-indicators that do not fit into the other pillars of the TQoL Framework.

Figure 4 TQoL framework used for the LIW indicators



The three pillars of the TQoL-framework and their related sub-domains address many life situations, for which in Luxembourg also a substantial cross-border dimension is existing. This aspect will now be examined in more detail in the following sections, using the elaborated assignment of LIW indicators as a basis for orientation.

Table 6 Coding of the indicators for the pillar “Good Life Enablers” (Quality of Place)

Basic Functionings and sub-domains		Corresponding LIW-indicators	
		Objective indicators	Subjective indicators
Household Functionings	Housing & basic utilities	(19) Number of rooms per person; (21) Total housing costs as share of household income; (23) Number of new dwellings II. (20) People living in overcrowded dwelling. (55) Recycling rate.	
	Health	-	-
	Education		
Social Functionings	Transport	-	-
	ICT connectivity	-	-
	Work	(17) Total accidents at work	
	Income (*)	(3) Net adjusted available household income; (6) Gini index; (7) Inter-decile ratio; (8) Men-women wage gap.	
	Consumption	-	-
	Public spaces	-	-
	Cultural assets	-	-
Ecological	Green infrastructure	-	-

	Protected areas	(58) Land use; (59) Organic farming	
(*) This sub-domain was added, as the current approach does not foresee any information on income-related aspects and because the definition for “consumption” is also not covering these aspects.			

Table 7 Coding of the indicators for the pillar “Life Maintenance” (Residents’ needs)

Basic Functionings	Corresponding LIW-indicators	
	Objective Indicators	Subjective Indicators
Personal Health & Safety (*)	<u>Health:</u> (24) Life expectancy at birth; (25) Prevalence of mental problems; (26) Suicide rate; (27) Death by cause; (28) Consumption of drugs.  <u>Safety:</u> (61) Offence rate.	<u>Health:</u> (29) Share of adults declaring to be in good or very good health; (30) Share of adults declaring to have chronic diseases; (31) Share of adults declaring to be limited in their everyday activity because of health reasons.  <u>Safety:</u> (51) Feeling of discrimination.
Economic & Social Health (**)	<u>Economic Health:</u> -  <u>Societal health:</u> (9) Risk of poverty after social transfers; (10) People in situation of severe material deprivation; (11) People unable to make ends meet; (12) Employment rate; (13) Unemployment rate; (14) Temporary job rate; (15) Forced part-time rate; (16) People living in household with low working intensity; (32) Long hours rate out of employee population; (34) Employment rate of women with children in mandatory schooling age; (36) Share of parental leaving in the couple. (38) Educational attainment; (39) Young people having left education early; (40) Reading skills at 15 years of age.	<u>Economic Health:</u> -  <u>Societal health:</u> (18) Feeling of job insecurity
Ecological Health	<u>Climate change:</u> (56) Usage of renewable energies.  <u>Environment health:</u> (52) Air pollution; (57) Car use.	<u>Environment health:</u> (54) Noise.
(*) Integrity of personal body and mind health. (**) Resources necessary for the people living healthy together in one place (village, town, city, metropolitan area).		

Table 8 Coding of the indicators for the pillar “Life Flourishing” (Residents’ wants)

Basic Functionings and sub-domains		Corresponding LIW-indicators (subjective and objective indicators)
Personal Flourishing	Self-esteem	(63) Life satisfaction.
	Self-actualisation	-
Economic and Societal Health	Interpersonal Trust (Social belonging)	(45) Frequency of social contacts;
	Institutional trust	(50) Confidence in institutions.
Ecological Flourishing	Ecosystems services and biodiversity wealth	-

## 4.2 Other relevant features

### 4.2.1 Approach towards QoL

The basic approach underlying the quality of life assessment under the “PIBien-être” project is focused on distributional issues, as the national project strives for a more encompassing evaluation of quality of life in Luxembourg that goes beyond monetary based indexes of quality of life. For this to achieve, the approach uses a total of 63 indicators for monitoring 11 thematic domains of people’s life ranging from income and wealth, over housing and occupation or health and social life, to education or well-being and the environment. The “PIBien-être” project adopts a time-series analysis, therefore evaluating quality of life of Luxembourg residents in comparison to their previous achievements and not to the achievements of residents of other countries<sup>57</sup>.

The “PIBien-être” project includes individual, household and national level indicators that are partly objective in nature and partly subjective. Out of the 11 thematic domains addressed, 6 domains combine objective and subjective indicators<sup>58</sup> while the others consist either of only objective indicators (e.g. “Income and wealth”; “Housing”; “Education and skills”; “Environment”) or subjective indicators (e.g. “Subjective well-being”).

### 4.2.2 Involvement of citizens – Citizen-centric approach to Quality of Life

The “PIBien-être” project and the related LIW adopt a citizen-centric approach to quality of life assessment, as the concept puts individuals (the people) at the heart of the measurement efforts. All indicators of the “PIBien-être” project are considered not only with regard to their average across the population, but also for specific sub-groups of residents. Indicators are analysed by various breakdowns such as age group, gender, income group, familiar status, and education<sup>59</sup>

The “PIBien-être” project and the LIW are indeed based on data collection and monitoring at the level of individuals. However, the nation-wide concept does not capture quality of life in the municipalities of Luxembourg, although the latter are the level for policy-making that is closest to the citizens.

<sup>57</sup> STATEC (2016), pp. 22, 166

<sup>58</sup> “Occupation”, “Health”, “Work-life balance”, “Social Relationship”, “Governance and Civil Engagement”, “Personal security”.

<sup>59</sup> STATEC (2016), p. 22

This somewhat ambivalent status of the citizen-centric approach was also addressed by several speakers during a recent parliamentary debate in Luxembourg on quality of life and the introduction of the LIW (January / February 2020). One contribution emphasised that values for the GDP say little about the satisfaction of the population and that humans are not primarily acting as "homo oeconomicus". Yet, another speaker highlighted that, above all, acceptance by the population is important and that the LIW must "*be borne by people*" otherwise it is "*doomed to fail*". As in Germany, the population should therefore be involved in the drafting<sup>60</sup>.

### **Misperceptions vs fact-based evidence**

Within the "PIBien-être" project and the LIW, there is indeed awareness about possible misperceptions. The "PIBien-être" project report includes a section discussing the concept of subjective well-being and summarising the evidence on its reliability. It also summarises the evidence on the determinants of well-being and reports some results stemming from data collected in Luxembourg in 2013<sup>61</sup>.

A first example is the adequate perception of the (objective or subjective) living conditions of the large proportion of the immigrant population in Luxembourg, as some study results suggest that they may be rather different from those of Luxembourg nationals. The "PIBien-être" project report acknowledges that future quality of life monitoring should therefore try to refine this aspect of the analysis, which will require more work for a better measurement as well as an extension of the analysed strata of the population<sup>62</sup>.

Another example is a less positive understanding of reality, which may be inherent especially to data coming from survey-based subjective indicators. This was also highlighted during a recent debate on quality of life and the introduction of the LIW in the Luxembourg Parliament, as the subjective "sense of security" might depict a situation that often does not correspond to the objective situation appearing from police statistics<sup>63</sup>.

### **4.2.3 QoL in a territorial context**

If people are at the core of the assessment process, quality of life should be measured from their everyday life perspective and by considering their living environment as the spatial frame of reference. This "Territorial Quality of Life" (TQoL) is attached to different groups of people having settled in one place and living daily in a functional space around that place. TQoL is thus determined by both, features present in the actual settlement place (quality of place) and a number of "functionings"<sup>64</sup> a person can accomplish in relation to his/her surroundings within a reasonable distance or time from the place of living (i.e. his or her life capabilities).

However, the nation-wide concept of the "PIBien-être" project and the LIW does not perceive the different context nuances and dynamics of quality of life that may exist at the level of Luxembourg's municipalities. More important even, the purely national focus excludes the

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<sup>60</sup> Luxemburger Wort (2020a)

<sup>61</sup> STATEC (2018), pp. 15-20

<sup>62</sup> STATEC (2018), p. 3

<sup>63</sup> Luxemburger Wort (2020a)

<sup>64</sup> The Intermediate Report of the ESPON QoL project states that the (...) term "functioning" is used in the capability approach to measuring well-being (A. Sen, 1993). Functionings are 'beings and doings', that is, various states of human beings and activities that a person can undertake. Capabilities are a person's real freedoms or opportunities to achieve functionings. Thus, for instance, while travelling is a functioning, the real opportunity to travel is the corresponding capability. In our "territorial functionings" concept we add another element: functionings in a territory depend on the action of agents – e.g. a service provider – taking care of building or maintaining those functionings. See: ESPON EGTC (2020), p. 7

intense cross-border exchange relations of various kinds that Luxembourg maintains with the adjoining border regions in France, Germany and Belgium.

The macro-economic relevance of these cross-border exchange relations may be illustrated by looking more closely at the variable “GDP per inhabitant”, for which Luxembourg is usually ranked among the top performing countries world-wide. Without the many cross-border commuters coming to work in Luxembourg each day from the neighbouring border regions, however, the Grand Duchy would lose 40% of its GDP per inhabitant value<sup>65</sup>.

Also, the territorial features of these cross-border exchange relations are highly important for an analysis of TQoL in Luxembourg. The immediately adjacent border areas in the three neighbouring countries belong to the functional space of the Luxembourg resident population and allow them to accomplish everyday border-crossing practices that can be relevant determinants for their quality of life. The inverse functional relations are of course also of high relevance for people living in the French, German or Belgian areas immediately across the Luxembourg state border.

Finally, also the basic “territorial functionings”<sup>66</sup> of border-close zones within and around Luxembourg include durable cross-border components that co-determine the quality of place of these areas. These are jointly used infrastructures and cross-border public services (CPS), which were established over the past decades with sometimes considerable investments and also continue to be set-up through new cross-border cooperation initiatives. This has made the border-close zones of Luxembourg and of the neighbouring regions in France, Belgium and Germany more attractive to people for living and settling, but also enables the respective resident population to enjoy the different elements of life maintenance (i.e. integrity of personal body and mind health; social resources necessary for living healthy together in one place; environmental conditions and ecological system).

The results of this evolutionary process can be illustrated by findings from a recently completed ESPON research project on cross-border public services<sup>67</sup>, which show that Luxembourg has the highest density of CPS provision throughout the entire European Union<sup>68</sup> (see: Map 3).

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<sup>65</sup> Luxemburger Wort (2020a)

<sup>66</sup> The Intermediate Report of the ESPON QoL project states that the “territorial functionings” concept includes another element: functionings in a territory depend on the action of agents – e.g. a service provider – taking care of building or maintaining those functionings. See: ESPON EGTC (2020), p. 7

<sup>67</sup> ESPON EGTC (2018a); ESPON EGTC (2018b)

<sup>68</sup> The project measured the density of CPS provision in relation to the surface of a country’s territory (i.e. number of CPS per 1,000 km<sup>2</sup>) and in relation to the length of its borders (i.e. number of CPS per 1,000 km of border length). In a EU28 perspective, country-wide figures show that Luxembourg is ranked 1st in both constellations (with 15.35 CPS per 1,000 km<sup>2</sup> and 182 CPS per 1,000 km border length).



The highest numbers of CPS are found at the borders between Luxembourg and Germany (all border segments with the Federal States of Rhineland Palatinate and Saarland) and at the borders between Luxembourg and Belgium (esp. border segments of the administrative districts / arrondissements Arlon and Bastogne in the province of Luxembourg of the Walloon Region).

A recent in-depth analysis of 2019 even identified more than 110 CPS with a direct involvement of Luxembourg (see: Annex 5).

The existing CPS cover a great variety of aspects that are of high relevance for the day-to-day cross-border life of people settled in the concerned border zones. They add to already existing domestic local or regional / national services and thereby further improve the resident population's quality of life in fields such as public transport, education, environment, risk protection, medical emergency care and public security.

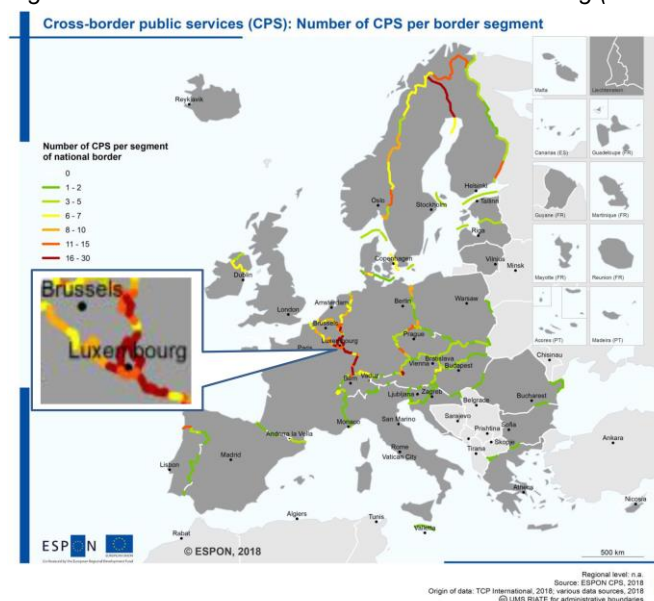
### 4.3 The “cross-border dimension” of quality of life in Luxembourg

This section attempts to identify the constituent elements of a cross-border dimension of quality of life in Luxembourg, which should also be taken into account when analysing quality of life through the current LIW-indicator framework. In doing so, we also take inspiration from works of Christian Wille on “cross-border living environments” in the Greater Region, which he describes on ground of a social-constructivist approach and by using survey-based empirical evidence<sup>69</sup>.

Already at an early stage of the “PIBien-être” project, the technical report of 2011 has explored the possibility of integrating the wider cross-border context of the Greater Region and / or cross-border workers into a measuring of quality of life in Luxembourg. However, this option was not considered and the related challenges were summarised as follows:

*Including the cross-border workers and or the Greater Region would have made it possible to explore a large number of issues, such as employment, housing, tertiary education, etc., and represents a major challenge for the future development of Luxembourg's statistics. However, the statistical information is available only at national level and the cross-border worker population fluctuates greatly (in that the individuals who make up that population may move in and out of it very quickly). Therefore, the population studied is, de facto, currently limited to the resident population. This conclusion is reinforced by the fact that certain proposals, such as the proposal that GNI per capita or household consumption should be prioritised, also restrict the scope of study to the resident population alone. Extension of the “GDP Well-being” indicators*

Figure 5 Number of CPS at the borders of Luxembourg (2017)



Source: ESPON EGTC (2018b)

<sup>69</sup> Wille (2015), Wille (2017), Wille / Roos (2018)

*and analysis to cross-border workers and/or the Greater Region could be considered / implemented at a later date. It would require a significant amount of cross-border development work on the statistics system.*<sup>70</sup>

Considering this former intention of the “PIBien-être” project, the following first explains in what ways cross-border living environments are developing in practice at the Luxembourg borders and then explores how this manifests in the people's everyday activities and possibly also contributes to their quality of life.

### ***How emerge “cross-border living environments” and “cross-border quality of life”?***

A cross-border living environment emerges primarily from the people's everyday border-crossing practices that are linked to different life situations. These practices can be seen in the spatial organisation of the resulting mobility flows between neighbouring border regions<sup>71</sup>. The frequency of these everyday practices usually increases if border-crossings can be accomplished by people within a reasonably low distance or a relatively short time period.

In addition to the pro-active behaviour of people, also "passive elements" contribute to creating a cross-border living environment. These are mainly intergovernmental agreements on specific topics of cross-border cooperation or existing cross-border public services. They are basically enabling or facilitating border-crossing activities of people from both sides of a border but are often not consciously perceived by the population.

Everyday border-crossing practices and "passive elements" also result in a certain level of quality of life for persons living and acting in border regions, the scope of which, however, is primarily determined by the specifically relevant life situation of an individual.

Applied to our specific case this means that the cross-border living environment of Luxembourg is established by everyday border-crossing practices, the inhabitants of the Grand Duchy and of the surrounding border regions in France, Germany or Belgium perform from their respective place of residence in the neighbouring border regions. Empirical studies for the Greater Region show that the most common border-crossing practices are to go to work in the neighbouring country, to do shopping for daily needs and for leisure-oriented purposes, to practice local recreation and tourism or to visit cultural events and to visit friends or family members on the other side of a border.

The associated cross-border dimension of quality of life in Luxembourg can be perceived holistically, if patterns of border-crossing interaction are identified for specific person groups and then allocated to two wider spatial-functional perspectives. With Luxembourg taken as point of reference, these perspectives can be labelled (1) "from within to outwards" and (2) "from outside to the inside".

### ***The perspective "from within to outwards"***

This perspective looks at different kinds of everyday border-crossing interaction that the Luxembourg resident population can realise on the territory of neighbouring border areas in France, Belgium and Germany. Important motives for border-crossing can be

- the advantage of shopping outside of Luxembourg (i.e. shopping for daily needs, leisure-oriented shopping), due to a higher purchasing power of Luxembourgish residents in the

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<sup>70</sup> CES / CSDD (2011), p. 14

<sup>71</sup> Wille (2017)

neighbouring regions (i.e. lower price level of certain consumer goods in the neighbouring border regions) or because of a much more diversified commercial offer<sup>72</sup>;

- free-time and recreation, due to the existence of an expanded or alternative cultural offer and the presence of special leisure facilities or historical, natural and ecological heritage assets that are worth visiting on the other side of the border;
- secondary and tertiary education or vocational education, due to a more extended or alternative school and university offer on the other side of the border (i.e. children of families living in Luxembourg attending schools in neighbouring border regions; young Luxembourgish adults who accomplish vocational training courses or university studies in neighbouring border regions).

The key issue to be explored under this dimension is whether the regular border-crossing interaction of Luxembourg's resident population is also a relevant determinant for their quality of life.

Several empirical studies show that the Luxembourg resident population is particularly active across borders in case of the first two motives, albeit with variable geographic-linguistic preferences for different groups of the Luxembourg resident population<sup>73</sup>. This tends to confirm that those aspects might also be of high relevance for the quality of life of the Luxembourg resident population.

A significant proportion of the Grand Duchy's inhabitants buy everyday goods for their daily needs across the border and even more persons drive to neighbouring regions for practicing leisure-oriented shopping. Residents living in Eastern Luxembourg prefer shopping in Germany, those from Southern Luxembourg primarily in France and those living in northern Luxembourg especially in Belgium. In addition to economic considerations, also socio-cultural aspects play a role. Luxembourgers have a significant preference for shopping in Germany, while the (French-speaking) foreign residents of Luxembourg significantly prefer France and Belgium.

A similar pattern emerges with excursions to neighbouring regions. After the inhabitants of Wallonia, the resident population of Luxembourg shows the strongest cross-border activities in the Greater Region. The border regions in Germany and France are visited by about 40% of the Luxembourg residents surveyed by studies, with the rest travelling to Wallonia. The neighbouring regions in Germany are a popular destination for excursions, especially for Luxembourgers, whereas foreigners resident in Luxembourg tend to prefer the neighbouring regions in France and Belgium.

### ***The perspective "from outside to the inside"***

This perspective looks at different kinds of everyday border-crossing interaction that persons living in the neighbouring border regions around Luxembourg can realise on the Grand Duchy's national territory. Depending on the basic motives for crossing the border, two main person groups are relevant for an analysis of quality of life.

(1) The first person group are cross-border workers from France, Belgium or Germany who work each day in different parts of Luxembourg. Although commuters usually leave Luxembourg and return back home across the border at the end of each day, they are actually spending a significant proportion of their lifetime within the Grand Duchy. This apparently

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<sup>72</sup> The cross-border area around Luxembourg is characterised by a particular high density of commercial areas, strategically located close to the border in order to attract Luxembourgish residents.

<sup>73</sup> Wille (2015), Wille (2017)

"homogenous" person group needs further distinction, since it is composed of two sub-groups with slightly different patterns of border-crossing interaction.

- The numerically most important sub-group are the "typical cross-border workers" who have their socio-cultural roots in the neighbouring border areas of France, Germany or Belgium. These cross-border workers indeed maintain friendships or family relations in Luxembourg, albeit at a significantly lower level than in their respective country of residence. Compared to other people of their country of residence, however, commuters have more intense social contacts in Luxembourg which can be attributed to their cross-border everyday mobility and the associated contacts at work. Nevertheless, friendships outside the professional context rarely develop due to long commuting journeys, family commitments and a general lack of time<sup>74</sup>.
- A small but steadily growing sub-group are the so-called "atypical cross-border workers", which represent around 4% of all Luxembourg commuters in 2017. These are persons of Luxembourg nationality who decided to settle in a neighbouring border area of France, Germany or Belgium because of lower living and housing / rental cost but continue to work in the Grand Duchy (i.e. in-commuting nationals)<sup>75</sup>. However, research suggests that this sub-group is in fact more significant in numbers if also foreign nationals who previously lived in Luxembourg but have relocated to neighbouring border areas are considered<sup>76</sup>. These residential migrants, in particular those of Luxembourg and Portuguese nationality, enjoy greater financial scope after their move and continue to carry out many everyday practices in the Grand Duchy in addition to activities in their new residential area. They combine shopping and working in Luxembourg, continue to visit doctors or go to inpatient treatments in the Grand Duchy, or trust the quality of products sold on the other side of the border. Luxembourg thus remains an important territory of reference for many of the residential migrants<sup>77</sup>.

The cross-border life situations of these sub-groups include a number of aspects that both shape their own quality of life and are relevant for the quality of life in Luxembourg. The following realities should therefore be considered when domestic policy decisions are prepared in the Grand Duchy or when joint cross-border initiatives are launched together with partners from the neighbouring regions:

- The general framework conditions on the Luxembourg labour market and the ways how they affect the quality of life of cross-border workers (e.g. income earned, quality of work, social recognition at the workplace, multilingualism of the working environment, job security, transfer payments received from Luxembourg social security and family benefit funds, factors hindering cross-border labour mobility, etc.).
- The general mobility context within Luxembourg and its effects on commuting and the quality of life of cross-border workers (e.g. high or low commuting distance and travel time between the place of residence and the place of work, choice of mobility mode / modes

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<sup>74</sup> Wille / Roos (2018), p.186

<sup>75</sup> Between 2001 and 2017, the number "atypical cross-border workers" increased from 1,200 (2001) to 3,900 (2012) and finally to 7,370 (2017). Most of these atypical cross-border workers live in the neighbouring border areas of Germany (37%) and Wallonia (37%), but only 22% on the French side. See: Stumm (2015), pp. 52, 53; IBA (2019a), p. 17

<sup>76</sup> A study of 2010 shows that Luxembourgers make up only a quarter of the atypical cross-border workers, whereas residential migrants with German and French or Belgian nationalities hold a remarkably high proportion (57%), followed by Portuguese (10%) and people of other nationalities (8%). See reference in: Wille / Roos (2018), p.180

<sup>77</sup> Wille / Roos (2018), p.187

for commuting, scope of cross-border public transport services and quality / reliability of the public transport services offered, etc.).

- The role of cross-border workers as consumers in Luxembourg, since they spend relevant parts of their earnings for purchasing durable or non-durable consumer goods in the Grand Duchy (e.g. expenditures for vehicles, furniture, fuel, tobacco products, alcohol, food at home or eating out in Luxembourg)<sup>78</sup> and thereby contribute to sustain the dynamism of the national economy.
- The general conditions for living in Luxembourg (esp. high real estate prices and rental costs) and their effect on further increasing the number of "atypical cross-border workers", who continue to have strong ties to their country of origin (e.g. family members or friends living on the other side of the border; children going to school in Luxembourg; visits to the doctor or inpatient treatments in Luxembourg etc.).
- The role of cross-border workers as an indispensable resource for the everyday functioning of nearly all life aspects in the Grand Duchy (i.e. shopping, leisure, goods production, public services, health care etc.) and the perception of their strong presence by the Luxembourg residence population, both in socio-economic and socio-cultural terms.

(2) The second group comprises all other residents of the German, Belgium or French border regions who are not cross-border workers but undertake more than just occasional visits to the Grand Duchy of Luxembourg. Their motives for border-crossing interaction are in fact very similar to those of Luxembourg residents (see above "from within to outwards"), namely

- the advantage of shopping in Luxembourg, due to a different commercial offer (esp. food products) or because of lower price levels for certain consumer goods (e.g. fuel, tobacco products, alcohol, coffee etc.);
- free-time and recreation, due to the existence of an expanded or alternative cultural offer and the presence of special leisure facilities or historical, natural and ecological heritage assets that are worth visiting on the other side of the border;
- an upholding of regular personal contacts with family members or friends who are living in Luxembourg;
- vocational education and tertiary education, if young adults or students living in the three neighbouring border regions accomplish professional trainings or studies at the University of Luxembourg.

This cross-border perspective is thus mainly a result of Luxembourg's pivotal economic role within the Greater Region. The multilingual Grand Duchy attracts most of the cross-border workers commuting within the Greater Region and has also a commercial and leisure or cultural offer that is attractive for many residents of the neighbouring border regions. Despite their "external" character, these aspects have also implications for the quality of life in Luxembourg.

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<sup>78</sup> A 2012 working paper of the Luxembourg Central Bank highlighted that cross-border workers have spent in 2010 relevant parts of their earnings in Luxembourg. Despite the significantly lower estimated average total net wealth of cross-border commuter households (€ 240,000) in comparison to that of Luxembourg resident households (exceeding € 700,000), it is estimated that each cross-border commuter household poured on average € 9,300 per annum into the Luxembourg economy, representing about 15% of their total gross income and 17% of their gross income from Luxembourg. See: Banque Centrale du Luxembourg (2012), pp. 18-22

#### 4.4 Possible indicators and data sources for measuring cross-border quality of life

This section identifies possible indicators for measuring the above-described cross-border dimension of quality of life in Luxembourg and also explores data sources that could be used for “feeding” indicators on the related cross-border life situations.

The previous sections have shown (see in particular sections 4.1 and 4.3) that all thematic domains of the LIW include an evident cross-border dimension that should be captured by suitable indicators for different life situations in order to depict quality of life in Luxembourg more holistically. If one first looks at the original overall indicator system of the "PIBien-être" project and then also takes into account the various cross-border life situations, it is relatively easy to develop a variety of indicators that could possibly measure this reality. (see: Table 9).

If one now examines the question of how this cross-border dimension of quality of life could possibly be captured within the LIW's current indicator system, there are basically two options: (1) an introduction of special indicators into each of the existing 11 thematic domains or (2) the creation of a new thematic domain no. 12 for the “cross-border living environment of Luxembourg”, which includes a selection of indicators capturing the most relevant everyday border-crossing practices of different person groups.

However, a fundamental problem with the identified indicators is the availability of data, as their collection is in most cases "uncharted territory". For this reason, there will also not be data time series for many thematic areas that go back longer into the past (e.g. to the LIW reference year 2009). This obviously applies to all subjective indicators and also many objective indicators. In the latter case, however, time series could be "historically reconstructed" for some indicators in several thematic domains (e.g. income and wealth, occupation, housing, health, education and skills, environment, personal security).

Table 9 Possible indicators (objective and subjective) for different cross-border life situations

<b>LIW-domains</b>	<b>Examples for indicators capturing aspects relevant for specific cross-border life situations (not exhaustive list)</b>
Income and wealth	<ul style="list-style-type: none"> <li>• Purchasing power of the Luxembourg resident population in the neighbouring border regions of France, Belgium and Germany.</li> <li>• Proportion of household income that the Luxembourg resident population is spending in the neighbouring border regions of France, Belgium and Germany.</li> <li>• Purchasing power of cross-border workers in their country of residence.</li> <li>• Proportion of household income that cross-border workers are spending in Luxembourg.</li> <li>• Level of transfer payments received by cross-border workers from Luxembourg social security and family benefit funds if compared to comparable domestic allocations.</li> </ul>
Occupation	<ul style="list-style-type: none"> <li>• Difference between unemployment rates (long-term unemployment rates) in Luxembourg and in neighbouring border regions of France, Belgium and Germany.</li> <li>• Cross-border workers occupying a temporary job in Luxembourg (rate of all cross-border workers).</li> <li>• Cross-border workers in forced part-time work in Luxembourg (rate of all cross-border workers).</li> <li>• Cross-border workers' judgement about the quality of their employment in Luxembourg.</li> </ul>

LIW-domains	Examples for indicators capturing aspects relevant for specific cross-border life situations (not exhaustive list)
	<ul style="list-style-type: none"> <li>• Cross-border workers' judgement about their social recognition at the workplace in Luxembourg.</li> <li>• Cross-border workers' judgement about the multilingual context of their working environment.</li> <li>• Cross-border workers' judgement about job security.</li> <li>• Non-fatal accidents and fatal accidents at work involving cross-border workers.</li> </ul>
Housing	<ul style="list-style-type: none"> <li>• Difference between real-estate prices in Luxembourg and in neighbouring border regions of France, Belgium or Germany (at LAU level, specified for different border segments).</li> <li>• Number of "atypical cross-border workers" declaring to have relocated across the border for reasons of high real-estate prices or rental costs in Luxembourg.</li> <li>• Number of other persons with Luxembourg nationality (esp. retired persons) declaring to have relocated across the border for reasons of high real-estate prices or rental costs in Luxembourg.</li> </ul>
Health	<ul style="list-style-type: none"> <li>• Number of cooperation agreements between Luxembourg hospitals and hospitals in neighbouring border regions of France, Belgium or Germany, providing wider access to medical treatments for the Luxembourg resident population.</li> <li>• Proportion of the Luxembourg state border covered by cross-border agreements in the field of emergency medical aid (e.g. possible border crossing of ambulance cars or emergency medical helicopters).</li> </ul>
Work-life balance	<ul style="list-style-type: none"> <li>• Leisure and occupation time of cross-border workers.</li> <li>• Time that cross-border workers spend for commuting to their workplaces in Luxembourg.</li> <li>• Cross-border workers' satisfaction with work-life balance.</li> </ul>
Education and skills	<ul style="list-style-type: none"> <li>• Number of children of the Luxembourg resident population going to school in a neighbouring border region of France, Belgium or Germany.</li> <li>• Number of young adults from Luxembourg following vocational education courses in a neighbouring border region of France, Belgium or Germany.</li> <li>• Number of students from Luxembourg accomplishing their studies at a university located in a neighbouring border region of France, Belgium or Germany.</li> <li>• Number of young adults from neighbouring border regions in France, Belgium and Germany following vocational education courses in Luxembourg.</li> <li>• Number of students from neighbouring border regions in France, Belgium and Germany accomplishing their studies at the university of Luxembourg.</li> <li>• Cross-border workers' judgement about the appreciation of their skills in the context of the Luxembourg working environment.</li> <li>• Number of cross-border workers having accomplished further professional training or qualification courses in Luxembourg (lifelong learning).</li> </ul>
Social relationships	<ul style="list-style-type: none"> <li>• Luxembourg residents who regularly visit friends living in a neighbouring border region of France, Belgium or Germany.</li> <li>• Luxembourg residents who regularly visit family members living in a neighbouring border region of France, Belgium or Germany.</li> </ul>

LIW-domains	Examples for indicators capturing aspects relevant for specific cross-border life situations (not exhaustive list)
	<ul style="list-style-type: none"> <li>• Cross-border workers who regularly visit friends living in Luxembourg.</li> <li>• Cross-border workers who regularly visit family members living in Luxembourg.</li> <li>• Other inhabitants of border regions in France, Belgium or Germany (not cross-border workers) who regularly visit friends living in Luxembourg.</li> <li>• Other inhabitants of border regions in France, Belgium or Germany (not cross-border workers) who regularly visit family members living in Luxembourg.</li> <li>• Perception of the strong presence of cross-border workers by the Luxembourg resident population (i.e. in socio-economic and socio-cultural terms).</li> </ul>
Governance and civic engagement	<ul style="list-style-type: none"> <li>• Cross-border workers being members in a trade union of Luxembourg.</li> <li>• “Atypical cross-border workers” with Luxembourg nationality having become members in a civic association (e.g. social, cultural, sport) or a political party at their new place of residence in a neighbouring border region of France, Belgium or Germany.</li> </ul>
Environment	<p>Natural resources and land use:</p> <ul style="list-style-type: none"> <li>• Share of the municipal territory on both sides of the Luxembourg border (at LAU level) that is covered by national parks, nature parks, landscape parks or geo-parks.</li> <li>• Share of national parks, nature parks, landscape parks or geo-parks at the Luxembourg border that closely cooperate and practice joint management with a similar structure on the other side of the border.</li> <li>• Share of the municipal territory on both sides of the Luxembourg border (at LAU level) that is covered by Natura 2000 areas.</li> <li>• Share of Natura 2000 areas located in the municipal territory on both sides of the Luxembourg border for which ecological continuity across borders is established (e.g. by cross-border “green infrastructures”).</li> <li>• Share of built-up land in the total surface of all municipalities situated on both sides of Luxembourg’s borders (i.e. area covered by settlements and buildings, roads or railways etc.).</li> </ul> <p>Environmental protection and sustainable mobility:</p> <ul style="list-style-type: none"> <li>• Share of all municipalities situated on both sides of Luxembourg’s borders (at LAU level) that are jointly cleaning their sewage in a single wastewater treatment plant.</li> <li>• Total volume of jointly cleaned sewage from municipalities situated on both sides of Luxembourg’s borders (i.e. effective annual volume).</li> <li>• Water pollution in main cross-border river courses and / or border-rivers (esp. Our, Sauer, Mosel, Alzette, Attert, Chiers, Eisch, Wiltz).</li> <li>• Share of cross-border workers using private cars for reaching their place of work in Luxembourg (differentiated by geographical origin / region of residence).</li> <li>• Share of cross-border workers using cross-border public transport services (bus, train or tram) for reaching their place of work in Luxembourg (differentiated by geographical origin / region of residence).</li> <li>• Satisfaction with the scope and quality of the cross-border public transport offer, differentiated by “cross-border workers” and “other users” living in the neighbouring border areas.</li> </ul>



LIW-domains	Examples for indicators capturing aspects relevant for specific cross-border life situations (not exhaustive list)
	<ul style="list-style-type: none"> <li>• Air pollution along main road axes that cross-border workers use by car for reaching their place of work in Luxembourg (“cross-border commuting corridors”).</li> <li>• Proportion of the population of municipalities situated at cross-border commuting corridors that declares to be affected by transport-related noise (in Luxembourg and the neighbouring border areas).</li> </ul>
Personal security	<ul style="list-style-type: none"> <li>• Share of all municipalities situated on both sides of Luxembourg’s borders (at LAU level), which practice close cooperation and regular joint fire drills between local fire brigades.</li> <li>• Share of all municipalities from Luxembourg and neighbouring border regions located along main cross-border river courses and / or border-rivers, which are involved actively in cross-border flooding prevention initiatives.</li> <li>• Quality of cross-border police and customs cooperation between Luxembourg and the neighbouring border regions in France, Belgium or Germany.</li> </ul>
Subjective well being	<p>Overall satisfaction of people with their cross-border life situations (life satisfaction), differentiated for specific person groups and age classes:</p> <ul style="list-style-type: none"> <li>• Satisfaction of the Luxembourg resident population with their everyday border-crossing practices (for younger residents and elderly).</li> <li>• Satisfaction of cross-border workers from neighbouring border regions with their everyday border-crossing practices.</li> <li>• Satisfaction of the “other” resident population in neighbouring border regions with their everyday border-crossing practices (for younger residents and elderly).</li> </ul>

One important issue closely linked to the still very limited availability of data is the process of collecting adequate data for these indicators. In principle, the relevant methods of empirical social research are available for this purpose. In our cross-border case, however, they have to be adapted to the conditions of a four countries context and also be implemented uniformly within a multilingual framework.

An interesting example for comprehensive data gathering is the mobility survey commissioned by the Luxembourg Ministry of Transport (“Luxmobil”), for which 40,000 households in the Grand Duchy and 45,000 cross-border commuters had been contacted in early 2017<sup>79</sup>. Another more recent example is the online-survey “*How residents and cross-border commuters feel about public transport in Luxembourg*” that was conducted in February 2020. This online survey was organised by the “Luxembourg Institute of Socio-Economic Research” (LISER) and partly sponsored by the Vrije Universiteit Brussel and the University of Luxembourg. The survey aimed at estimating the level of satisfaction with public transport and mobility in Luxembourg, while participation in the survey was anonymous and intended to cover the entire population (over 16 years of age) and different population groups (i.e. workers, students, pensioners or high school students, both cross-border commuters and Luxembourg residents)<sup>80</sup>.

Finally, the data collection process also raises challenges regarding the organisation and practical implementation as well as the associated workload, which both can hardly be faced

<sup>79</sup> Le Gouvernement du Grand-Duché de Luxembourg (2020d); MDDI (2017)

<sup>80</sup> LISER (2020)

by Luxembourg alone. For that reason, Luxembourg should address the topic of "measuring cross-border quality of life" within the framework of the institutionalised political-administrative cooperation in the Greater Region (i.e. the Greater Region Summit and its working groups) and discuss its joint implementation with the partners from Germany, Belgium and France.

#### **4.5 Cross-border quality of life in times of COVID-19**

During the first half of 2020, essential foundations for the people's quality of life have been severely shaken by an introduction of government-imposed containment measures aimed at preventing a Europe-wide spread of the COVID-19 virus. Within the individual countries, local or regional mobility of the resident population was restricted in very different ways and to different levels of intensity. As a result, people's ability to carry out their daily activities and to establish direct interpersonal encounters has been considerably reduced. In parallel, many governments of the EU member states have decreed the closure of their borders in a helpless reflex of "national sealing off" without prior bilateral agreement with their respective neighbouring countries or appropriate multilateral coordination at the level of EU institutions.

The variety of response patterns to the COVID-19 pandemic and the resulting "EU-wide patchwork" in the crisis management not only damaged the basic spirit of Schengen Europe, but also caused insecurity and anger among the inhabitants of border regions or sometimes even gave rise to resentments that were thought to have been forgotten. These developments also had a particularly significant impact on the national and cross-border dimensions of quality of life in Luxembourg.

In order to contain the COVID-19 pandemic, the four countries involved in the Greater Region have introduced very different national or sometimes also regional measures that have not been coordinated with the respective neighbouring countries. For the inhabitants of territories close to the border, the indeed necessary measures resulted in a massive restriction of their local / regional or national mobility and also of their cross-border freedom of movement, which at the same time brought about deep cuts in their quality of life.

During the COVID-19 crisis in the first half of 2020, Luxembourg neither closed its borders nor established controls on persons wishing to enter Luxembourg. Thus, inhabitants from the neighbouring regions were not prohibited from travelling to the Grand Duchy. However, the special government regulation "COVID-19" of March 2020<sup>81</sup> limited the movement of all persons within the territory of Luxembourg to what is "strictly necessary" and the grand-ducal police also controlled such movements on the national territory. Different to this, however, Luxembourg's three neighbouring countries have established controls of cross-border movements to a variable extent. Whereas the border between Luxembourg and France remained open in both directions, Germany and Belgium had unilaterally closed their borders to a large part of the population living on both sides and also established direct controls on persons at border crossing points<sup>82</sup>. Although cross-border workers from the neighbouring regions were still able to pass through all three borders, Luxembourg's Prime Minister Xavier Bettel voiced clear criticism of these unilateral border closures that were introduced without prior dialogue with the Grand Duchy: *"A whole lot of people have misunderstood this. Social distance does not mean national distance. It does not mean that countries suddenly want nothing to do with each other"*<sup>83</sup>.

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<sup>81</sup> Règlement grand-ducal du 18 mars 2020 portant introduction d'une série de mesures dans le cadre de la lutte contre le Covid-19.

<sup>82</sup> Großregion - Grande Région (2020a)

<sup>83</sup> Tagesschau (2020)

In addition, the three neighbouring countries of Luxembourg carried out checks on persons to varying degrees. In practice, a distinction can be made between the "hard border closure" of Germany and a more flexibly implemented "border filtering" in the cases of Belgium and France. This also created more diplomatic tension between Luxembourg and Germany than between Luxembourg and Belgium or France<sup>84</sup>. Moreover, these control practices had very different effects on the people's everyday border-crossing practices (i.e. restrictions on shopping, refuelling and family visits) and thus on cross-border mobility flows (see: Box 1). Luxembourg thus felt "surrounded" by the unilateral border closures, mainly because a free movement of persons and smooth cross-border border traffic are of vital importance both for the national economy as well as for the day-to-day medical care and nursing of sick or elderly people in the Grand Duchy.

*Box 1 COVID-19 crisis management at different segments of the Luxembourg state border*

Between mid-March and 16 May 2020, the Corona crisis led **Germany** to close border crossings and establish border controls on its border with Luxembourg. Luxembourg was only informed of these unilateral measures by a brief official letter from Berlin. One of Germany's very unfortunate decisions was to allow border crossings at only a few border crossings in the south and south-east of Luxembourg and to close other smaller crossings completely. However, through negotiations a little later, Luxembourg was able to achieve the reopening of two other border crossings in the north of the Grand Duchy (Dasbourg, Vianden) by making 50 Luxembourg officials available to assist the German Federal Police. At the few passable bridges over the border rivers Moselle, Sauer and Our, persons entering Germany were strictly and systematically controlled by the German Federal Police. The "good reason" for each person's entry into Germany was checked very restrictively. This led, for example, to a problematic situation in the Luxembourgian border municipality of Grevenmacher, where the main traffic artery from the bridge across the river Mosel to the motorway to Luxembourg City runs right through the town. In normal times the bridge is crossed by more than 15,000 cars a day, but the individual checks have now resulted in traffic jams of three to four hours and thus higher emission values due to exhaust gases. Due to the prohibition of border crossing for citizens from Luxembourg, the otherwise lively exchange between families and friends on both sides was temporarily "suspended". The experiences with the unilateral border closure and the controls could have negative effects in the long term, as they may increase reservations and resentment of Luxembourg citizens towards their German neighbours. But also German cross-border workers and other people living in the German border regions were angry about the unilateral border closure, as their lives were considerably affected by the controls, either because they were stuck in traffic jams every day or because they were denied to carry out their otherwise normal activities on the Luxembourg side.

Since 18 March 2020, **Belgium** had banned all non-essential travel abroad. Between 20 March 2020 and 6 June 2020, checks on persons were also reintroduced at the borders with Luxembourg, but without closing existing border crossing points. Cross-border workers had to show a certificate (Luxembourg or Belgian document) completed by the employer in order to duly justify their border crossing. In non-professional cases, Belgium only authorised essential border crossings that could be adequately proven. Non-essential border-crossing movements were considered tourist trips or leisure activities, shopping, refuelling and visits to friends or family members living in a neighbouring country. Despite the formal border controls, crossing the Belgian-Luxembourg border could in practice be carried out without major obstacles, provided that people presented the necessary documents proving that their movement was reasonable and justified in the context of the crisis.

Although **France** had not introduced official checks on persons at its border with Luxembourg, the police carried out checks on French territory to ensure that the strict containment measures were applied. In practice, it was therefore still possible for cross-border workers and several other person groups to cross the border into France with the required certificates / documents.

*Sources: Großregion - Grande Région (2020a); Tagesschau (2020); Ministeriums des Innern des Königreichs Belgien (2020); ACTU.fr (2020); Le Quotidien (2020)*

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<sup>84</sup> Le Quotidien (2020)

Also, with regard to the now foreseen national or regional timetables for a gradual relaxation of sector-specific measures to fight the spread of the corona virus (i.e. border openings; retail and other services; early education and schools or universities; leisure facilities, etc.), there is still little cross-border consistency in the Greater Region<sup>85</sup>. As the neighbouring countries and regions have very different approaches to gradual easing that can also be continuously adapted to new developments, existing rules may frequently change and therefore be confusing for people with daily or frequent cross-border activities.

Against this background, on 28 April 2020, the acting president of the Greater Region Summit, the Minister President of Saarland, Tobias Hans, invited the other executives of the Greater Region to a joint video conference. At this conference, it was discussed how the current and future challenges of the Corona crisis can be overcome together in a Greater Region context. The discussions focussed on the concertation of measures such as cross-border assistance in the medical sector, but also on the still existing border closures in the largest cross-border commuting area of Europe. Already in the weeks prior to this video conference, some concrete cooperation had taken place (e.g. cross-border admission of emergency patients from Grand Est; mutual support through medical equipment). In addition, a joint "Corona Task Force" of the Greater Region was set up to deal with the current challenges posed by different regulations in the national Corona crisis management<sup>86</sup>.

A first concrete follow-up was the Franco-Luxembourg meeting for bilateral coordination of the lifting of the containment measures, held by videoconference on 5 May 2020. It was attended by the Secretary of State for European Affairs at the French Ministry of Europe and Foreign Affairs, the Luxembourg Minister for the Greater Region and the President of the Grand Est region. Discussion focused on essential issues of cross-border importance such as the health sector, economic recovery and trade, border workers, mobility and transport, access to schools and universities, and social and family life. In their capacity as chairpersons of the Franco-Luxembourg intergovernmental commission for the strengthening of cross-border cooperation (Commission intergouvernementale franco-luxembourgeoise pour le renforcement de la coopération transfrontalière, CIG), the two ministers agreed on the objective of setting up joint coordination measures and concerted communication, which will be implemented in cooperation with the representatives of the Grand Est region. The next meeting of this intergovernmental commission is to be organised in autumn 2020<sup>87</sup>.

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<sup>85</sup> Großregion / Deutsch-Französisch-Schweizerische Oberrheinkonferenz (2020)

<sup>86</sup> Großregion - Grande Région (2020b)

<sup>87</sup> Le Gouvernement du Grand-Duché de Luxembourg (2020c)

## 5 Synthesis and conclusions

The “PIBien-être” project and the LIW aim to measure quality of life in Luxembourg at a nationwide level and to provide an alternative assessment benchmark for national government policies (i.e. in addition to GDP). The structures involved in the original conceptualisation are advisory bodies to the national government (CES, CSDD) and certain structures of public administrations (ODC, STATEC), which are also active in the ongoing further development of the overall concept.

Quality of life in Luxembourg is recorded by examining 11 different areas of life (thematic domains) with a total of 63 indicators, most of which are also used in the LIW. If one compares the content and conceptual structure with the Territorial QoL-Framework" of the ESPON QoL project, it becomes clear that most LIW indicators can be assigned to the pillars "Territorial Functionings" and "Life Maintenance". In contrast, only very few indicators refer to the third pillar "Life Flourishing".

However, the “PIBien-être” project and the LIW do not reflect living conditions at the local level within Luxembourg, nor do they cover the daily cross-border exchange relations with the neighbouring border regions in France, Belgium and Germany that are very important for the Grand Duchy. Both dimensions are, however, very important components of the reality of life in the Grand Duchy and are therefore also of central importance for national (and local) policy-making. This double non-consideration is well known from the official side, but the main reasons for this are seen mainly in the non-availability of adequate cross-border data.

This is why the case study has focused on the cross-border dimension of quality of life in Luxembourg, resulting from the close and reciprocal socio-economic and cultural links between the Grand Duchy and the four neighbouring border regions of Grand Est (FR), Wallonia (BE), Rhineland-Palatinate and Saarland (DE). It has been shown that the cross-border everyday reality is of considerable importance for the well-being of Luxembourg. On the one hand, this importance results from a number of everyday cross-border practices that Luxembourg's resident population can engage in the immediately adjacent border areas of the four neighbouring regions. On the other hand, a large number of people from the neighbouring border regions commute to work in Luxembourg every day (equal to around one third of Luxembourg's resident population) and play a very central role in many sectors of the Grand Duchy's economy. These cross-border workers, as well as other parts of the neighbouring resident population, shop and engage in leisure activities on the Luxembourg territory, which together makes a significant contribution to the dynamism of the national economy.

For these reasons, it would be important that this cross-border dimension is also more systematically included in a future measurement of quality of life in Luxembourg. The urgency of taking better account of this cross-border dimension became particularly evident in the outbreak of COVID-19 epidemic in 2019/2020. Although the spread of the virus knows no borders throughout Europe and also not in the Greater Region, the introduction of national measures to contain the epidemic was uncoordinated. Although this had a temporary but negative impact on the cross-border dimension of the quality of life of people in Luxembourg and in the neighbouring border-close zones, the adverse experiences will certainly remain in the "collective memory" of the population for a longer time to come.

## 6 Recommendations

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

Our analysis of the “PIBien-être” project and the LIW has shown that it would be important to include a cross-border dimension into the future measurement of quality of life in Luxembourg. To that end, the case study presented a first approach for systematically recording this cross-border dimension of quality of life (see: sections 4.3 and 4.4), which was also reviewed by representatives of the Luxembourg Ministry of Energy and Spatial Planning. Possible indicators for capturing this cross-border dimension in different areas of life can be defined relatively easily. However, the main challenge is to build up an adequate data set based on time series that allows measuring this cross-border dimension.

This indeed desirable but also very costly cross-border extension of the “PIBien-être” and LIW indicators must first of all find consensus within Luxembourg. For this, the national government and subsequently also the government’s national advisory structures as well as STATEC should agree to establish cross-border indicators and also to collect the required data on a cross-border basis. Then, a feasibility study should be elaborated that can be coordinated at a cross-border level by the network of statistical offices of the Greater Region, which also operates the statistics portal of the Greater Region (<http://www.grande-region.lu/portal/de/institutionen>). Nevertheless, it should be clear that a measurement of this cross-border dimension should relate primarily to the population living in areas close to the border and not to the inhabitants of the whole Greater Region.

This preparatory activity should also involve several other existing cross-border structures or initiatives. These include the Greater Region’s geographical data portal (GIS-GR / SIG-GR), the Interregional Labour Market Observatory (IBA / OIE), the “Luxembourg Institute of Socio-Economic Research” (LISER)<sup>88</sup> and the Centre for Border Studies of the University of the Greater Region (UniGR). Politically and socially, also the Economic and Social Committee of the Greater Region could be interested in a cross-border measuring of the quality of life. Finally, this initiative could also be sought as an implementing project of the spatial development concept of the Greater Region (REKGR / SDTGR), for which a strategy is currently being drawn up by the relevant spatial planning actors of the four concerned regions<sup>89</sup>.

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

For the Territorial QoL Framework of the ESPON project, an "additional building block" should be developed, so to speak, that shows how a cross-border dimension of quality of life can be systematically captured. This would be a particular added value of the study, which can be used by border regions in Europe that have a high degree of mutual interdependence. The relevance of this has been clearly shown by the example of Luxembourg and its four neighbouring regions Grand Est (FR), Wallonia (BE), Rhineland-Palatinate and Saarland (DE), where the intense cross-border economic and socio-cultural exchange relations are also a decisive component of the quality of life especially of people living in zones close to the national borders.

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<sup>88</sup> In the area of housing, LISER has recently carried out a feasibility study for the creation of an "Observatoire du logement" in the Greater Region.

<sup>89</sup> See: <https://amenagement-territoire.public.lu/fr/grande-region-affaires-transfrontalieres/SDT-GR.html>

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## **7.2 Other sources**

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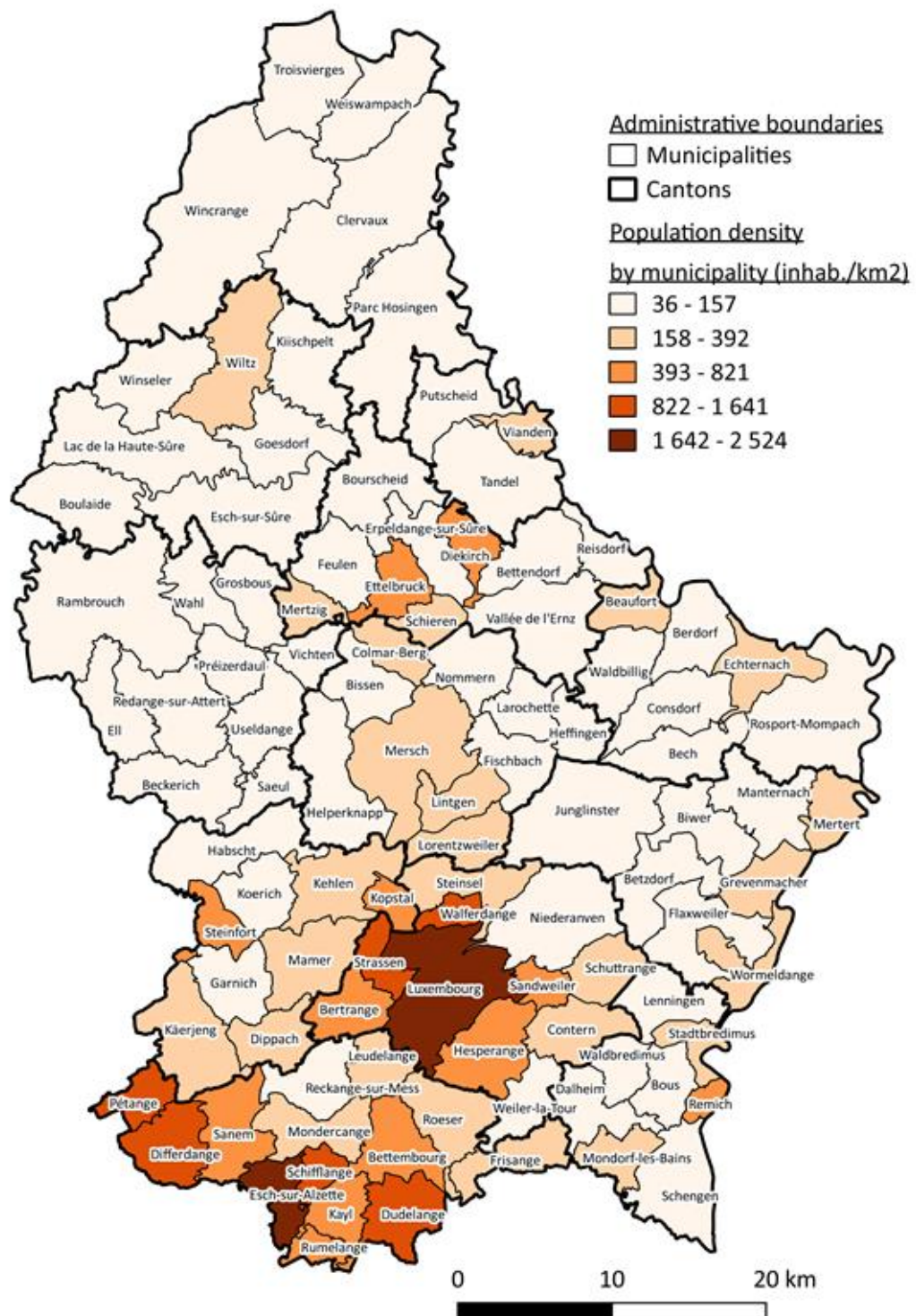
## 8 Annexes

### Annex 1 - Basic structure of natural areas in Luxembourg



Source: Ministère de l'environnement du Luxembourg ; Administration de cadastre et de la topographie du Luxembourg

## Annex 2 - Population density by municipality (1st of January 2020)

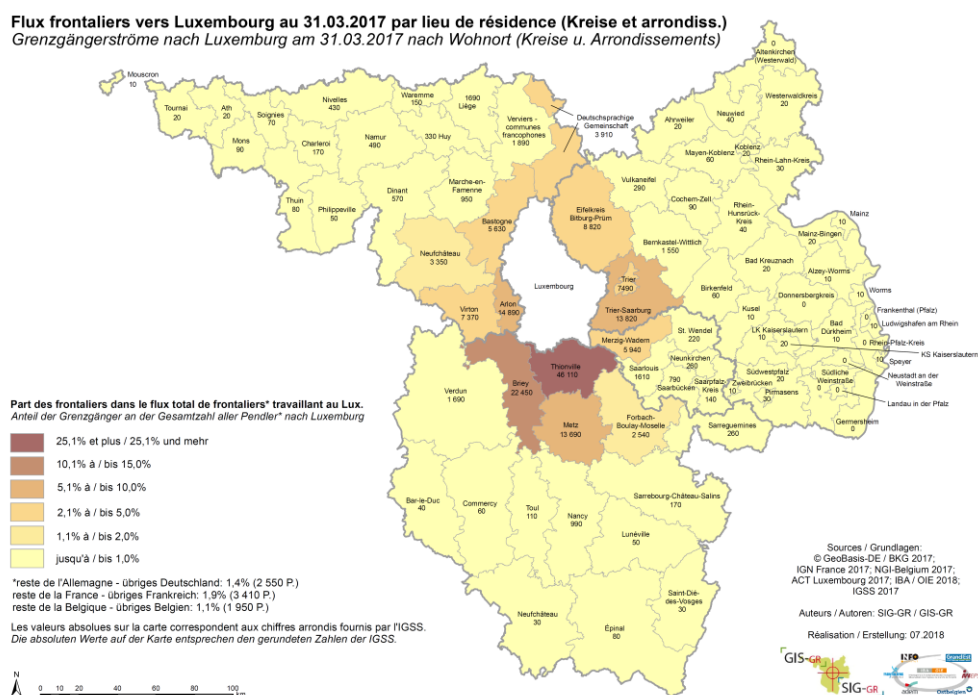


Sources: ACT, STATEC et CTIE (2020)  
 Author: STATEC  
 Date: April 2020

### Annex 3 - Situation of the “cross-border employment zone Luxembourg” in 2017<sup>90</sup>

The entire Grand Duchy of Luxembourg and the close-by NUTS 3 border areas located in the neighbouring regions Grand Est (France) and Wallonia (Belgium) as well as in the German Federal States of Rhineland-Palatinate and Saarland form together the most important cross-border employment zone within the EU (see: Map A-3). In early 2017, around 172,000 people commuted every day from these neighbouring border areas to their workplaces in different parts of Luxembourg.

Figure A-3: Cross-border commuter flows to Luxembourg and places of residence of commuters



Source: IBA (2019a), p. 27

51% of the cross-border commuters working in Luxembourg came from the Lorraine part of the Grand Est region (LOR), 25% from Wallonia (WAL) and 24% from Rhineland-Palatinate (RLP) and Saarland (SAR). The places of residence of these commuters are mostly at a distance less than 30 km from the Luxembourg state border (92% of all commuters), but still 8% lived in areas located between 30 km up to even 50 km away from that border (see: Table A-3).

The high cost of living in Luxembourg also gives rise to a growing phenomenon called "atypical cross-border workers". These are persons of Luxembourg nationality who have relocated to a neighbouring border region (residential migration), but continue working in Luxembourg. In 2017, these atypical cross-border workers accounted for around 4% of all persons commuting to Luxembourg (7,370 persons).

<sup>90</sup> IBA (2019a), pp. 17-18, 20-31, 59-63, 71-73

Table A-3: Cross-border workers in Luxembourg and their place of residence in adjacent NUTS 3 areas

Arrondissements LOR (88.270 Commuters)		Arrondissements WAL (42.160 Commuters)		Kreise RLP (32.500 Commuters)		Kreise SAR (8.960 Commuters)	
<b>Commuter area near the border (&lt; 30 km to Luxembourg state border)</b>							
Thionville	46.110	Arlon	14.890	Trier-Saarburg	13.820	Merzig-Wadern	5.940
Briey	22.450	Virton	7.370	Kreisfreie Stadt Trier	7.490		
Metz	13.690	Bastogne	5.630				
Forbach-Boulay-Moselle	2.540	Neufchâteau	3.350	Bitburg-Prüm	8.820	Saarlouis	1.610
		Verviers (DG)	3.910				
<b>Sub-total</b>	<b>84.790</b>	<b>Sub-total</b>	<b>35.150</b>	<b>Sub-total</b>	<b>30.130</b>	<b>Sub-total</b>	<b>7.550</b>
<b>Commuter area more distant to the border (&gt; 30 km to Luxembourg state border)</b>							
Verdun	1.690	Marche-en-Famenne	950	Bernkastel-Wittlich	1.550	Regionalverband Saarbrücken	790
Nancy	960						
Sarreguemines	260	Liège	1.690				
Sarrebourg-Château-Salins	170	Verviers (CF)	1.890	Vulkaneifel	290	Neunkirchen	260
		Huy	330			St. Wendel	220
		Waremme	150				
Other Arrondissements	400	Other Arrondissements	2.000	Other Kreise and cities	530	Saarpfalz-Kreis	140
<b>Sub-total</b>	<b>3.480</b>	<b>Sub-total</b>	<b>7.010</b>	<b>Sub-total</b>	<b>2.370</b>	<b>Sub-total</b>	<b>1.410</b>

Source: Service provider (EureConsult), elaborated on ground of data from the Luxembourg General Inspection for Social Security (IGSS) and of figures indicated in map A-1 on the previous page.

All this makes the Luxembourg labour market very unusual, as cross-border workers from the three surrounding countries account for a significant share in the Grand Duchy's total employment and are already the dominant workforce in a larger number of sectors / branches of the Luxembourg economy:

- For the shares of different groups of employees in the total employment of Luxembourg, it can be seen that Luxembourg nationals account for only 27%, foreign Luxembourg residents for around 29% and cross-border workers for 44%.
- Persons of Luxembourgish nationality hold a dominant employment share in the (semi) public sector such as “public administration” (89%), “energy supply” (68%) or “healthcare and social services” (45%). They are also the leading group in employment in other services (36%), with a slight lead over the other two groups.
- Foreign residents in Luxembourg are the leading group for employment in sectors such as “private households with staff” (78%), “extraterritorial organisations and bodies” (56%) or “hotels / gastronomy” (54%), but also in “agriculture and forestry” (45%) as well in “education and teaching” (41%).
- Cross-border workers are the leading group for employment in the four economic sectors “mining and quarrying” (46%), “water supply and disposal” (47%), “transport and storage (around 48%) and “financial and insurance services” (49%).
- Cross-border workers hold a dominant employment share of over 50% in the following six economic sectors: “professional, scientific and technical services” (52%), “information and communication” (52%), “construction” (53%), “trade, maintenance and repair of motor vehicles” (55%), “other economic services” (around 56%) and “manufacturing” (around 65%).

## Annex 4: Composition of the Luxembourg Index of Well-being (LIW)

Domain	N	Indicators	Unit of measure	Source	Time-series	Interpretation	Included in LIW	Interpolated	
Income and wealth	1	GNI per capita	EUR, annual, per capita, at current market prices	EUROSTAT	2009-2015		yes	no	
	2	Total household wealth	Median of the distribution, EUR, annual	Household Finance and Consumption Survey	2010, 2014		yes	yes	
	3	Net adjusted available household income	EUR (real, 100 = 2014)	EU-SILC	2009-2015		yes	no	
	4	The yearly growth rate of the gross household income	EUR (real, 100 = 2014)	EU-SILC	2009-2015		no	no	
	4	The yearly growth rate of the net available household income, before social transfers, but with old-age and survivor's benefits	EUR (real, 100 = 2014)	EU-SILC	2009-2015		no	no	
	4	The yearly growth rate of the net available household income, before all social transfers	EUR (real, 100 = 2014)	EU-SILC	2009-2015		no	no	
	4	The yearly growth rate of the net adjusted available household income	EUR (real, 100 = 2014)	EU-SILC	2009-2015		no	no	
	5	Household total consumption (marketed goods)	EUR (real, per capita, 100 = 2014)	Household Budget Survey (STATEC)	2009-2015		no	no	
	5	Household total consumption (non marketed goods)	EUR	Time Use Survey	2014		no	NA	
	6	Gini index	0-100	EU-SILC	2009-2015		yes	no	
	7	Inter-quintile ratio	ratio	EU-SILC	2009-2015		no	no	
7	Inter-decile ratio	ratio	EU-SILC	2009-2015		yes	no		
8	Men-women wage gap	hourly gross wages in nominal terms	EU-SILC	2009-2015		yes	no		
9	Risk of poverty before social transfers	%	EU-SILC	2009-2015		inverted	no	no	
9	Risk of poverty after social transfers	%	EU-SILC	2009-2015		yes	no	no	
10	People in situation of severe material deprivation	%	EU-SILC	2009-2015		yes	no	no	
11	People unable to make ends meet	%	EU-SILC	2009-2015		yes	no	no	
Occupation	12	employment rate	%	EU-LFS	2009-2015		yes	no	
	13	unemployment rate	%	EU-LFS	2009-2015		yes	no	
	13	long-term unemployment rate (Eurostat definition)	%	EU-LFS	2009-2015		inverted	no	no
	13	long-term unemployment rate (CES-CSDD definition)	%	EU-LFS	2009-2015		inverted	no	no
	14	temporary job rate	%	EU-LFS	2009-2015		yes	no	no
	15	Forced part-time rate	%	EU-LFS	2009-2015		yes	no	no
	16	People living in household with low working intensity	ratio over people in the labor force 18-59 y.o.	EU-SILC	2009-2015		inverted	yes	no
	17	Total accidents at work	adjusted number of accidents per 100,000 workers	EUROSTAT	2009-2015		yes	no	
	17	Non-fatal accidents at work	adjusted number of accidents per 100,000 workers	EUROSTAT	2009-2015		no	NA	
	17	Fatal accidents at work	adjusted number of accidents per 100,000 workers	EUROSTAT	2009-2015		no	NA	
	18	Feeling of job insecurity	%	EU-SILC	2009-2015		yes	no	
Housing	19	Number of rooms per person	continuous	EU-SILC	2009-2015		yes	no	
	20	People living in overcrowded dwelling	%	EU-SILC	2009-2015		yes	no	
	21	Total housing costs as share of household income	%	EU-SILC	2009-2015		inverted	yes	no
	22	number of new dwellings	continuous	STATEC	2009-2013		no	yes	
	23	number of new dwellings II	continuous	STATEC	2009-2013		yes	yes	
Health	24	Life expectancy at birth	number of years	EU-Health for All	2009-2013		yes	yes	
	24	Life expectancy at age 1	number of years	EU-Health for All	2009-2013		no	NA	
	24	Life expectancy at age 15	number of years	EU-Health for All	2009-2013		no	NA	
	24	Life expectancy at age 45	number of years	EU-Health for All	2009-2013		no	NA	
	24	Life expectancy at age 65	number of years	EU-Health for All	2009-2013		no	NA	
	24	Life expectancy in good conditions, men	number of years	EU-Sustainable Development Strategy	2009-2015		no	NA	
	24	Life expectancy in good conditions, women	number of years	EU-Sustainable Development Strategy	2009-2015		no	NA	
	25	Prevalence of mental problems	SDR (Age-standardized death rate)	EU-Health for All	2009-2013		yes	yes	
	26	Suicide rate	SDR (Age-standardized death rate)	EU-Health for All	2009-2013		inverted	yes	yes
	27	Death by cause	SDR (Age-standardized death rate)	EU-Health for All	2009-2013		inverted	yes	yes
	28	Consumption of drugs, by type	number of boxes	IGSS	2009-2014		yes	yes	
29	Share of adults declaring to be in good or very good health	%	EU-SILC	2009-2015		yes	no		
30	Share of adults declaring to have chronic diseases	%	EU-SILC	2009-2015		yes	no		
31	Share of adults declaring to be limited in their everyday activity because of health reasons	%	EU-SILC	2009-2015		yes	no		
Work-life balance	32	Long hours rate out of employee population	%	EU-LFS	2009-2015		inverted	yes	no
	33	Leisure and occupation time	hours	TUS	2014		no	NA	
	34	Employment rate of women with children in mandatory schooling age	%	EU-LFS	2009-2015		yes	no	
	35	Time spent commuting	minutes	TUS	2014		no	NA	
	36	Share of parental leaving in the couple	%	EU-SILC	2009-2015		yes	no	
	37	satisfaction with work-life balance, employed and non-employed	0-10	EU-SILC	2013		no	NA	
	37	satisfaction with work-life balance, only employed	0-10	EU-SILC	2013		no	NA	
Education and skills	38	Educational attainment	%(tertiary education)	EU-LFS	2009-2015		yes	no	
	39	Young people having left education early	%	EU-LFS	2009-2015		inverted	yes	no
	40	Reading skills (at 15 years of age)	%	PISA	2009, 2012, 2015		yes	yes	
	41	Civic skills of students (at 14 years of age)	%	International Civic and Citizenship Education Study			no	NA	
Social relationships	42	Having anyone to discuss with personal matters	%	EU-SILC	2013, 2015		no	NA	
	42	Possibility to ask for help	%	EU-SILC	2013, 2015		no	NA	
	42	Trust in others	%	EU-SILC	2013, 2015		no	NA	
	43	Membership in social, cultural, sport associations	%	European Values Study	2008		no	NA	
	44	Time spent volunteering	minutes	Time Use Survey	2014		no	NA	
45	Frequency of social contacts	%	EU-SILC	2009, 2013-2015		yes	yes		
Governance and civic engagement	46	Voter turnout	%		2009, 2013		no	NA	
	47	Consultation on rule making	average score	Better Life Index	2013		no	NA	
	48	Membership in political and civic associations	%	European Values Study	2008		no	NA	
	49	Knowledge of languages	%		2011		no	NA	
	50	Confidence in institutions	%	Eurobarometer	2009-2015		yes	no	
	51	Feeling of discrimination	%		2009, 2011, 2014		yes	yes	
Environment	52	Air pollution	PM10		2009-2014		yes	yes	
	53	Water pollution		Administration de la Gestion de l'Eau	2009, 2015		no	NA	
	54	Noise		EU-SILC	2009-2015		yes	no	
	55	Recycling rate	%		2009-2015		yes	no	
	56	Usage of renewable energies	%		2009-2015		yes	no	
	57	Car use	passengers per kilometer		2009-2014		yes	yes	
	58	Land use	%	Administration du Cadastre et de la Topographie	2009-2015		yes	no	
	59	Organic farming	%		2009-2015		yes	no	
	60	Environmental disease burden	%		2012		no	NA	
	Personal security	61	Offence rate	number of offences		2009-2015		yes	no
62		Feeling of safety: walking alone at night	%		2013		no	NA	
Subjective well-being	63	Life satisfaction	0-10	Eurobarometer	2009-2015		yes	no	

Note: Indicators marked as inverted have been recoded so that higher values indicate better quality of life. For instance, the share of people affected by chronic diseases has been inverted in the share of people without chronic diseases according to the following formula: No Chronic diseases = 100 - Chronic disease

Source: STATEC (2018), p. 179

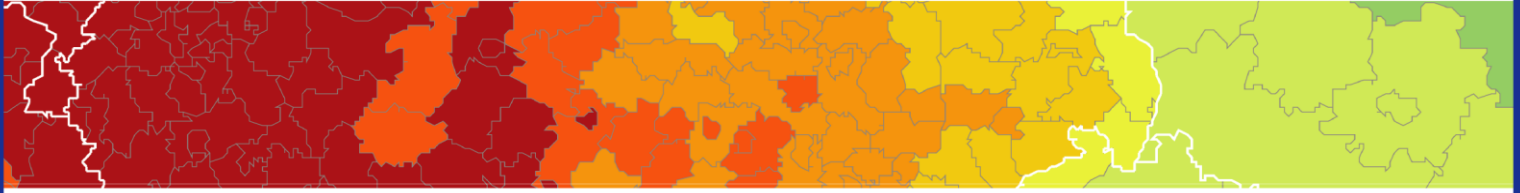
## Annex 5 - Cross-border public services at Luxembourg borders in 2019

Policy fields	Cross-border public services
Public transport (total: 64 CPS)	<ul style="list-style-type: none"> <li>• 1 electrically operated Mosel ferry between Oberbillig (DE) and Wasserbillig (LU)</li> <li>• 17 cross-border bus services between Luxembourg and the Walloon Region (LU-BE)</li> <li>• 14 cross-border bus services between Luxembourg and the Grand Est Region (LU-FR)</li> <li>• 9 cross-border bus services between Luxembourg and Rhineland-Palatinate (LU-DE)</li> <li>• 8 cross-border bus services between Luxembourg and Saarland (LU-DE)</li> <li>• 6 cross-border local / regional public rail services between Luxembourg and the Walloon Region (LU-BE)</li> <li>• 7 cross-border local / regional public rail services between Luxembourg and the Grand Est Region (LU-FR)</li> <li>• 2 cross-border local / regional public rail services between Luxembourg and Rhineland-Palatinate (LU-DE)</li> </ul>
Tourism (total: 2 CPS)	<ul style="list-style-type: none"> <li>• German-Luxembourg tourism information office (DE-LU)</li> <li>• Cross-border public body (GLCT) "International Sports-, Culture and Leisure Centre Ralingen-Rosport" (DE-LU)</li> </ul>
Healthcare and emergency medical care (total: 2 CPS)	<ul style="list-style-type: none"> <li>• LUXLORSAN (LLS) - cross-border Health Observatory Wallonia-Lorraine-Luxembourg (BE-FR-LU)</li> <li>• Agreement between the Grand Duchy of Luxembourg and Germany on medical emergency intervention in border areas</li> </ul>
Secondary and tertiary education (total: 2 CPS)	<ul style="list-style-type: none"> <li>• German-Luxembourg high school „Schengen Lyzeum“ (DE-LU)</li> <li>• University of the Greater Region "UniGR" (BE-DE-FR-LU)</li> </ul>
Vocational education and further training (total: 5 CPS)	<ul style="list-style-type: none"> <li>• Bilateral agreement on cross-border vocational training between the state of Rhineland-Palatinate and the Grand Duchy of Luxembourg (DE-LU), with related courses implemented.</li> <li>• Bilateral agreement between the government of Luxembourg and the Grand Est region on cross-border vocational training (LU-FR), with related courses implemented.</li> <li>• Framework agreement on cross-border apprenticeship training between the Luxembourg Chamber of Crafts and the Trier Chamber of Crafts (DE-LU), with related courses implemented.</li> <li>• Cross-border vocational counselling by the employment agency Trier and the Luxembourg employment agency ADEM (DE-LU), providing information about training opportunities and access regulations in neighbouring countries.</li> <li>• Continuing education in the hospital sector (DE-LU), involving the St. Therese Hospital in Luxembourg and the Educational Institute of the Merciful Brothers Trier, Rhineland-Palatinate.</li> </ul>
Labour market (total: 5 CPS)	<ul style="list-style-type: none"> <li>• EURES "Greater Region" (BE-DE-FR-LU)</li> <li>• Interregional Labour Market Observatory IBA (BE-DE-FR-LU)</li> <li>• Task Force Cross-border Workers of the Greater Region 2.0 (DE-FR-LU-BE)</li> <li>• Source and Documentation Center EURES / Grand Est (also: FR-LU)</li> <li>• La Maison du Luxembourg at Thionville (LU-FR)</li> </ul>
Water management, river management and flood prevention (total: 5 CPS)	<ul style="list-style-type: none"> <li>• International Commissions for the Protection of the Rivers Mosel and Saar IKSMS (LU-DE-FR)</li> <li>• Cross-border framework agreement between the Walloon Region and the Grand Duchy of Luxembourg on the treatment of wastewater, the protection of drinking water production and the monitoring of the nitrate directive (BE-LU)</li> <li>• Cross-border inter-municipal "river management partnership Our" between Wallonia, Luxembourg and Rhineland-Palatinate (LU-BE-DE)</li> </ul>



<b>Policy fields</b>	<b>Cross-border public services</b>
	<ul style="list-style-type: none"> <li>• 2 cross-border inter-municipal river management partnerships “Attert” and “Sûre” between Wallonia and Luxembourg (LU-BE)</li> </ul>
Nature and landscape protection	<ul style="list-style-type: none"> <li>• German-Luxembourg cross-border nature park (DE-LU)</li> </ul>
Sewage water treatment and drinking water provision (total: 24 CPS)	<ul style="list-style-type: none"> <li>• Cross-border sewage purification at the international wastewater treatment plant in Echternach-Weilerbach (DE-LU)</li> <li>• Cross-border sewage purification at the international wastewater treatment plant in Rosport (DE-LU)</li> <li>• Cross-border sewage purification at the international wastewater treatment plant in Mompach (DE-LU)</li> <li>• Cross-border sewage purification at the international biological wastewater treatment plant in Reisdorf-Wallendorf (DE-LU)</li> <li>• Cross-border sewage purification at the international wastewater treatment plant in Bettel (DE-LU)</li> <li>• Cross-border sewage purification at the international wastewater treatment plant in Stolzemburg (DE-LU)</li> <li>• Cross-border sewage purification at the international wastewater treatment plant in Hoesdorf (DE-LU)</li> <li>• Cross-border purification of sewage from Luxembourg properties and service stations in Rambrouch at the wastewater treatment plant in Martelange (BE-LU)</li> <li>• Cross-border sewage purification at the wastewater treatment plant in in Huldang-Stackburren (LU-BE)</li> <li>• Cross-border sewage purification at the international wastewater treatment plant in Obere Eisch-Steinfort (BE-LU)</li> <li>• Cross-border sewage purification at the wastewater treatment plant in Lexy (FR-LU)</li> <li>• Cross-border purification of sewage from a municipality in Lorraine (now: Grand Est) at the wastewater treatment plant in Mondorf-les-Bains (FR-LU).</li> <li>• Cross-border purification of sewage from municipalities in Lorraine (now: Grand Est) at the wastewater treatment plant in Bettembourg (FR-LU)</li> <li>• Cross-border purification of sewage from municipalities in Luxembourg at the wastewater treatment plant in Perl-Besch (DE-LU)</li> <li>• Cross-border drinking water provision in case of water shortage between Ralingen (DE) and Rosport (LU)</li> <li>• Cross-border drinking water supply at the Mosel river between Konz (DE) and the Luxembourg water association SIDERE (LU)</li> </ul>
Firefighting, emergency services and public security (total: 3 CPS)	<ul style="list-style-type: none"> <li>• Cooperation between local fire-fighting brigades of Mompach, Metzdorf and Trier-Land (DE-LU)</li> <li>• Multilateral cross-border police and customs co-operation (BE-DE-FR-LU)</li> <li>• Cross-border juridical and police cooperation between the three countries of the Benelux Economic Union (here only BE-LU)</li> </ul>

Source: Service provider (EureConsult S.A.), overview elaborated on ground of data from the inventory established for the ESPON project CPS and findings from the currently elaborated socio-economic analysis for the Interreg VI-A programme “Greater Region” 2021-2027 (not yet public).



### **ESPON 2020 – More information**

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

Phone: +352 20 600 280

Email: [info@espon.eu](mailto:info@espon.eu)

[www.espon.eu](http://www.espon.eu), [Twitter](#), [LinkedIn](#), [YouTube](#)

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