UCLouvain

KU LEUVEN



BRUFO2050

Sustainability of the Brussels food system

Research report Q2

Suggested citation:

Amrom, C., Vandersteen, Q., De Schaepmeester, H., Riera, A., Mathijs, E., & Baret, P. (2026). *Sustainability of the Brussels food system. BRUFO2050 Research Report Q2.* SFERE/KU Leuven & SYTRA/UCLouvain. Funded by Innoviris.Brussels. https://sytra.be/publication/brufo2050/

Visuals by Céline Chevalier.

Table of content

GLOSSARY **5**

1 GENERAL INTRODUCTION **7**

2 SUSTAINABILITY OF THE BRUSSELS FOOD SYSTEM **9**

3 METHODOLOGY **10**

3.1 Selection and adaptation of the sustainability framework 10
3.2 Selection of indicators 11
3.3 Operationalisation of the assessment 12
3.3.1 Environmental dimension 12
3.3.2 Socio-economic dimension 13

4 RESULTS **14**

4.1 Environmental footprint of Brussels' food demand 14
4.2 Food waste 15

5 SOCIO-ECONOMIC ASSESSMENT OF THE BRUSSELS FOOD SYSTEM **17**

5.1 S1 – Human health 17
5.1.1 S1.1 - Prevalence of overweight and obesity 17
5.1.2 S1.2 – Plant-based protein consumption 18
5.1.3 S1.3 – Adherence to dietary recommendations 18
5.2 S2 – Working conditions and labour rights 19
5.2.1 S 2.1 - Employment in the agri-food sector 19
5.2.2 S2.2 - Employment contracts 20
5.2.3 S2.3 - Atypical working hours 20
5.3 S3 – Decent income 21
5.3.1 S3.1 – Average income 21
5.3.2 Indicator S3.2: Turnover of the food industry 21
5.4 S4 – Socio-economic inequalities 22
5.4.1 S4 - Poverty risk rate in Brussels 22
5.4.2 S4.2 - BIM beneficiaries 22
5.4.3 S4.3 - Income disparity in food spending 23
5.5 S5 – Food democracy 23
5.5.1 S5.1 - Public engagement and awareness on sustainable food system issues 23
5.5.2 S5.2 - Equitable access to diverse and sustainable food outlets 24
5.5.3 S5.3 - Policy framework and support for socially vulnerable groups in the food system 25
5.6 S6 – Social cohesion 26
5.6.1 S6.1 - Urban food production and community gardening 26
5.6.2 S6.2 - Number of sales points in short supply chains (SSC) 27
5.7 S7 – Food security 27
5.7.1 S7.1 - Affordability of food and food price inflation 27
5.7.2 S7.2 - Geographic accessibility to diverse food retailers and "food deserts" 28
5.7.3 S7.3 - Food insecurity and reliance on food aid 28
5.7.4 S7.4 - Brussels' food self-sufficiency rate 29

6 DISCUSSION **30**

CONCLUSION **32**

7 REFERENCES 33

APPENDIX A – REVIEW AND SELECTION OF SUSTAINABILITY FRAMEWORKS 36

FRAMEWORK 1: THE "CITY REGION FOOD SYSTEM TOOLKIT" (CFRS) 36
FRAMEWORK 2: AGRI-FOOD SYSTEMS SUSTAINABILITY APPROACH (AFSSA) 37
FRAMEWORK 3: REFERENTIAL OF SUSTAINABLE FOOD IN WALLONIA 38
FRAMEWORK 4: SUSTAINABILITY DOUGHNUT 38
FRAMEWORK 5: THE GOOD FOOD STRATEGY 2 39
FRAMEWORK 6: RÉFÉRENTIEL DE DURABILITÉ 39
FRAMEWORK 7: THE SUSTAINABILITY COMPASS 39

APPENDIX B – SOCIO-ECONOMIC INDICATORS: DATA SOURCES AND DEFINITIONS 40

APPENDIX C – ENVIRONMENTAL INDICATORS: DATA SOURCES AND DEFINITIONS 45

Glossary

Adaptability: the capacity of actors in the system to influence resilience - in a socio-ecological system essentially to manage it (Walker et al., 2004)

Barrier: A specific factor of a system that hinders the adoption of innovative practices and strategies (proposed definition). When barriers are stronger than drivers promoting change, the current production system is strengthened and self-perpetuated, creating a lock-in (Weituschat et al. 2022)"

Exploratory scenarios: Explorative scenarios are defined as "multiple plausible futures described in words, numbers and/or images" (van Notten et al. 2003). The scenarios methodology, rooted in systems science, aims to recognize and explore uncertainty and complexity within the decision-making context. Rather than simplifying this context or pretending to provide a single forecast, it embraces the inherent uncertainties (van der Sluijs 2005, Kok et al. 2006) in (Vervoort, Joost et al., 2016)

Food system: the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded. The food system is composed of sub-systems (e.g. farming system, waste management system, input supply system, etc.) and interacts with other key systems (e.g. energy system, trade system, health system, etc.). Therefore, a structural change in the food system might originate from a change in another system (FAO, 2014).

Food supply chain is a managed process, a combination of knowledge and skills, spanning electronics, biology and the social science of economics, human behavior, psychology and more (Bourlakis & Weightman, 2003)

Lever: An influential factor or mechanism that can be strategically utilized to exert influence on a system to break free from an existing lock-in situation and enable a transition to a more desirable state (proposed definition).

Lock-in: A phenomenon occurring due to the tendency for policies, technologies, cognitive frames, infrastructure, and social systems to co-evolve and reach a state of stability and self-perpetuation (Courtois et al., 2024). Lock-ins occur when links or feedback between these factors combine to lock a system or set of actors onto a particular pathway or behaviors, thereby hampering any change towards a potentially superior system (adapted from Truong, Trencher, and Matsubae 2022).

Multistakeholders scenarios: exploratory scenarios can engage multiple legitimate perspectives involved in framing and addressing messy challenges such as food security and sustainability (Reilly and Willenbockel 2010)

Resilience: the capacity of a system to absorb disturbance and reorganize while undergoing change to still retain essentially the same function, structure, identity, and feedback (Walker et al., 2004)

Resilience of food system: covers the capacity of a food system to absorb disturbance and reorganize while undergoing change. The concept of « resilience » goes beyond the « sustainability » concept by integrating risks of shocks and rupture as well as dependency relation with other components of the food system. [1]

Transition: Transition theory comes from research on socio-technical innovation (Vervoort, Joost et al., 2016). It seeks to understand how niche-level activities are up-scaled into broader socio-technical regimes, resulting in socio-technical transitions (Rotmans 2005, Geels and Schot 2007, Kemp et al. 2007). Transitions are conceptualised as co-evolutionary change processes involving many societal dimensions. (Geels and Schot 2007) central idea in transition management is a multi-level perspective that identifies niches, sociotechnical regimes, and landscapes (as the contexts for socio-technical regimes). When shifts in landscapes or socio-technical regimes happen, this can allow niche practices to flourish and create new socio-technical regimes. Transition theory elaborates on a typology of transition pathways (Geels and Schot 2007)

Transformation: The word "transformation" is typically used to refer to fundamental changes in structure, functions and relations within (social-ecological) systems (Vervoort, Joost et al., 2016). Such transformations lead to new interaction patterns and have the potential for new emergent outcomes. Transformations are complex, dynamic, and multi-dimensional, involving social, institutional, cultural, technological, ecological, and political dimensions. Therefore, transformations must be examined through inter–and transdisciplinary lenses. Transformations tend to be political, involving winners and losers, which means that aspirations for transformational change are often contested (Patterson et al. 2016).

Transformability: "the capacity to create a fundamentally new system when ecological, economic, or social (including political) conditions make the existing system untenable" (Walker 2004 in (Vervoort, Joost et al., 2016).)

Sustainable development: a development that meets the needs of the current generation without compromising the ability of future generations to meets their own needs (Brundtland Commission Report)

Sustainable consumption: the use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations' (1994 Oslo Symposium on Sustainable Consumption)

Sustainable food system: is a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised. (FAO, 2014). This means that:

- It is profitable throughout (economic sustainability);
- It has broad-based benefits for society (social sustainability); and
- It has a positive or neutral impact on the natural environment (environmental sustainability).

[1] Greniers d'abondance, Projet de résilience alimentaire : https://resiliencealimentaire.org/methodologie/

1 General introduction

BRUFO2050 examines how the Brussels-Capital Region (BCR) could move towards a more sustainable and resilient food system by 2050. Funded by the Innoviris Prospective Research Program (2023), the project combines food-system analysis, stakeholder engagement and exploratory scenario development. It seeks to understand the structures and relationships that shape the current system, identify factors that hinder or enable change, and explore plausible pathways towards a more sustainable and resilient future.

The project considers the food system as a whole, while paying particular attention to the supply activities connecting production and consumption, like wholesale, transport, processing and retail, including supply to the hospitality sector. The project addresses three main objectives, translated into five research questions (

Figure **1**) :

1. **Analyse the current food supply system**
   - Question 1: How does the current system operate?
   - Question 2: How sustainable is the current system?
2. **Identify barriers, lock-ins and strategic levers**
   - Question 3: What are the barriers preventing the system from shifting toward a more sustainable system?
3. **Develop future scenarios and pathways**
   - Question 4: What can the future possibly look like for the Brussels food system?
   - Question 5: How to progress towards the most sustainable food supply system?

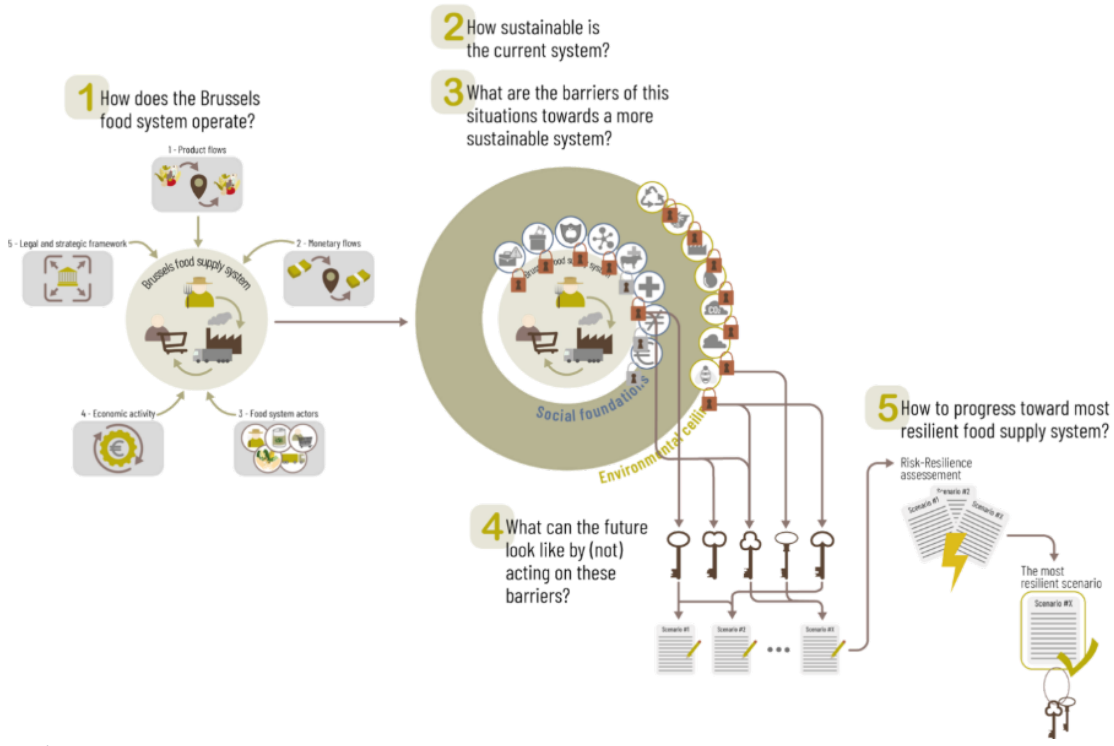


Figure 1: *Overview of the BRUFO2050 project and its five research questions.*

Each research question is addressed through a dedicated report and a specific combination of methods. Together, the reports build from a description of the current system (Q1), to its sustainability assessment (Q2), an analysis of barriers and lock-ins (Q3), the exploration of future scenarios (Q4), and the identification of strategic actions (Q5)[2].

This report addresses research question 2: How sustainable is the Brussels food system currently? Building on Q1, which describes the system's actors, activities and flows, Q2 has two objectives. First, it develops and adapts a framework for assessing the sustainability of the Brussels food system. Second, it applies that framework using available quantitative and qualitative evidence. The resulting assessment is intended as a baseline for the barriers analysis in Q3 and the scenario work in Q4, instead of a comprehensive measurement of every impact of the food system.

[2] All reports are publicly available on https://sytra.be/publication/brufo2050/.

2 Sustainability of the Brussels food system

The way food is produced, processed, distributed, sold and consumed affects both environmental pressures like climate and ecosystems, as well as social pressures like people's ability to access adequate, healthy food. A sustainability assessment therefore needs to consider environmental and socio-economic dimensions together (FAO, 2014; HLPE, 2020). Increasingly, cities are recognizing the importance of transforming their food systems into more sustainable models. Although urban areas often depend on production and resources from elsewhere, they concentrate consumers, actors and policy levels that can influence different parts of the food system, thereby creating opportunities for transformative action (Moragues-Faus et al., 2024). However, it also means that a city-level assessment must account for impacts and dependencies beyond its administrative boundaries.

Since 2016, the Brussels-Capital region (BCR) has been addressing the sustainability of the region's food system through the development of a regional Good Food strategy. This strategy outlines various general and specific objectives and action plans to achieve a more sustainable food system, based on the challenges faced by the Brussels food system (Bruxelles Environnement, 2021; Fremault, 2015). The food system is also connected to development in the neighbouring regions, including the Flemish GO4Food [3]strategy and the Walloon Manger Demain [4]strategy. These initiatives provide important policy context, but they do not in themselves constitute a comprehensive, regularly updated sustainability assessment of the Brussels food system.

Building on the first research report, this document aims to serve as a baseline – aiming to depict, document and analyse the present situation and some trends of the Brussels food system. A set of indicators established a structured baseline of selected environmental and socio-economic conditions. The findings are intended to support the subsequent BRUFO2050 research, including the barriers analysis (Q3) and interviews to be led with actors to examine what is hindering a more sustainable system and which elements are contributing to good results and success.

[3] https://lv.vlaanderen.be/beleid/go4food-vlaamse-voedselstrategie/go4food-food-strategy-flanders
[4] https://www.wallonie.be/fr/manger-demain

3 Methodology

Assessing the sustainability of a food system requires a framework that defines what sustainability means, indicators that translate this concept into observable dimensions, and evidence that can be used to describe the current situation. Because food-system impacts occur across multiple sectors and territories, no single dataset or indicator can capture the system in its entirety. The assessment was conducted in three steps: (1) the selection and adaptation of a sustainability framework, (2) the selection and adaptation of indicators, and (3) collection and analysis of available data. The process was iterative as the initial indicators were reviewed against relevance to the Brussels food system, data availability and the possibility of interpreting the results.

3.1 Selection and adaptation of the sustainability framework

A review of national and international sustainability frameworks was conducted to identify the approach most appropriate for the Brussels-Capital Region (BCR). The frameworks were considered in terms of their relevance to urban food systems, their coverage of environmental, social, and economic dimensions, and their compatibility with available data. Seven frameworks were reviewed and used to inform the development of the indicator set for BRUFO2050 (Appendix A). They provided complementary perspectives and served as sources for identifying relevant themes, dimensions and individual indicators. For the overall structure of the assessment, the Sustainability Compass developed by Le BASIC (2021) was selected and adapted for BRUFO2050. The indicators identified across the seven frameworks were subsequently reviewed, selected and organised within this Compass.

The Sustainability Compass is based on the Doughnut Economics concept developed by Kate Raworth, that describes a safe and just space between a social foundation and an ecological ceiling (Raworth, 2017). The social foundation refers to the conditions that are needed for people to meet their basic needs, while the ecological ceiling refers to environmental limits that should not be exceeded. Applied to food systems, this doughnut requires food-related activities to support health, good livelihoods and equitable access while remaining within environmental limits. The Compass translates this perspective into seven environmental themes and eight socio-economic themes (Figure 2 and Table 1). It also distinguishes between food consumption themes and themes that arrive across the wider food supply chain.



Figure 2: *The sustainability compass, adapted to the case of Brussels for BRUFO2050*

Table 1: *Environmental and socio-economic themes of the Sustainability Compass, adapted from Le BASIC (2021) for the Brussels food system. The animal-welfare them (S8) is not assessed in this report because no suitable Brussels-specific indicator or dataset was identified.*

	Themes	Explanation
ENVIRONMENT		
E1	**Climate change**	Caused by various greenhouse gas emissions, including carbon dioxide, methane, nitrous oxide, and losses in carbon storage, particularly due to land-use changes and soil artificialization.
E2	**Air pollution**	Linked to the formation of tropospheric ozone, primary and secondary fine particles, the volatilization of toxic substances, and heavy metals.
E3	**Biodiversity loss**	Exposure of wild species to toxic substances, as well as the degradation and fragmentation of natural habitats.
E4	**Water resources**	Depletion of water reserves, reduced irrigation capacity, diminished water retention abilities, and the pollution of rivers and groundwater by nitrates, phosphates, pesticides, antibiotics, and plastics.
E5	**Soil resources**	Decline in physical, biological, and organic qualities of soil, its climate-related degradation, and soil loss due to erosion and artificialization.
E6	**Non-renewable resources**	Including fossil, petrological, or mineral resources like phosphorus, potassium, and aluminium.
E7	**Ecosystems' capacity**	Potential to absorb waste generated throughout food chains. One of the main causes of this issue is food waste, which exacerbates all the aforementioned impacts by increasing the demand for raw materials, thereby intensifying the environmental pressure of the food system.
SOCIO-ECONOMY		
S1	**Human health**	Nutritional quality in food, food safety issues, risks of diseases, and physical and psycho-social risks at work.
S2	**Working conditions and labour rights**	Risk of discrimination, strenuous work, job insecurity, restrictions on union freedoms, and physical and psycho-social risks at work.
S3	**Decent income**	Income level, including wages below a living level, income instability, and a lack of economic predictability.
S4	**Socio-economic inequalities**	Disparities in income and wealth, as well as unequal access to public and private services.
S5	**Food democracy**	Manifested through obstacles preventing access to reliable and independent information about the food system and its impacts, and restrictions on the right to be involved in defining agricultural and food policies or to be heard in case of harm. This includes the curtailment of individual and collective freedom of choice regarding food and agricultural models.
S6	**Social cohesion**	Driven by the presence or absence of social and professional diversity, and of relationships within supply chains, social isolation, and the rise of socio-economic inequalities.
S7	**Food security**	Related to threats of supply chain disruptions, the inability to meet demand with domestic resources at the macro level, and household food insecurity at the micro level.
S8	**Animal welfare**	Representing the only non-anthropocentric fundamental rights within the socio-economic sphere, linked to painful practices, poor health conditions, lack of freedom of movement, and insufficient space per animal.

3.2 Selection of indicators

An initial inventory of qualitative and quantitative indicators was compiled from the frameworks and data sources reviewed. Indicators were organised according to the Sustainability Compass and classified into two categories:

- Brussels-relevant indicators, directly related to the Brussels food system and prioritised for the assessment.

- Contextual indicators, relating to food-system activities in Flanders, Wallonia, or Belgium more broadly, which may indirectly affect the Brussels food system, for example through the production of food consumed in Brussels.

The initial inventory resulted in 117 indicators. It was then screened for relevance, data availability, geographic coverage, temporal comparability and the extent to which each indicators represented its intended theme. The final selection aimed to identify the most relevant indicators while ensuring a balanced representation of the different thematic areas. At the same time, the number of indicators was kept as low as possible without compromising the representativeness of the assessment.

3.3 Operationalisation of the assessment

3.3.1 Environmental dimension

The initial indicator review showed that environmental data were more limited at the Brussels level than socio-economic data. In addition, a substantial share of the environmental pressures associated with food consumed in Brussels occurs outside the Region, particularly during agricultural production. A territorial inventory of emissions within Brussels would therefore capture only part of the food-related footprint. To address this issue, the assessment also uses a consumption-based footprint perspective.

A footprint approach estimates the resources and environmental pressures associated with meeting a population's consumption needs, including impacts occurring beyond the place of consumption. It complements territorial statistics but depends on assumptions about diets, production systems, trade and waste. Two tools were used in this report to provide complementary estimates.

PARCEL Wallonia[5] is an online food and agricultural footprint simulator developed for Wallonia (Vandersteen et al., 2025). For this assessment, it was used to model a population corresponding to the Brussels resident population and estimate the environmental impacts associated with its food demand, using the average Belgian dietary patterns, the share of organic products and food-waste levels. Outputs include the land area required for food production, agricultural employment, greenhouse gas emissions (kt CO_2e/year) and avoided soybean imports (kt/year).

The SYTRA production-consumption model[6] (referred to hereafter as the SYTRA tool) links a representation of agricultural production with food-consumption patterns. It covers crop and livestock production and can simulate different dietary patterns, including the current Belgian and Brussels diets and alternative diets such as national dietary recommendations and the EAT-Lancet diet. Its outputs include land use, nitrogen-cycle indicators, greenhouse gas emissions and biodiversity-related indicators.

Both tools were used in combination to benefit from their complementary strengths. PARCEL offers an accessible estimate of selected impacts associated with the food demand of the Brussels residents, while the SYTRA tool provides additional environmental indicators. The SYTRA tool was also used in the scenario exploration conducted in Q4 to quantitatively assess the outcomes of the four scenarios.

[5] https://parcel-wallonie.be/

[6] The SYTRA modelling tool is described in greater detail in the Q4 report, and in Riera et al. (2026).

3.3.2 Socio-economic dimension

The socio-economic assessment comprises twenty indicators covering seven of the eight socio-economic themes of the Sustainability Compass. The indicators were selected based on data availability and their relevance to the Brussels food system. Where comparable observations were available, changes over time were calculated. Where only a single observation was available, the result is presented as a snapshot rather than a trend.

The twenty selected indicators are presented in Table 2 and discussed in Section 6. Appendix B documents the underlying data sources, reference years and indicator definitions. The uneven availability of data across themes should be kept in mind when interpreting the results, as the number of indicators does not necessarily reflect its importance.

***Table 2**: List of twenty social indicators structured per theme. Adaptation of Le BASIC's Sustainability Compass to the case of the Brussels food system.*

Themes	Selected indicators
S1. Human health	S1.1 Prevalence of overweight and obesity
	S1.2 Protein consumption from plant-based sources
	S1.3 Share of the population meeting dietary recommendations
S2. Working conditions and labour rights	S2.1 Number of jobs in the Brussels agri-food sector
	S2.2 Employment contract types in the agri-food and agricultural sectors
	S2.3 Employees with atypical working hours in agri-food sector in BCR
S3. Decent income	S3.1 Average income in agrifood industry in BCR
	S3.2 Turnover of the food industry
S4. Socio-economic inequalities	S4.1 Poverty risk rate in Brussels
	S4.2 BIM beneficiaries
	S4.3 Income disparity in food spending
S5. Food democracy	S5.1 Public engagement and awareness on food system issues
	S5.2 Equitable access to diverse and sustainable food outlets
	S5.3 Policy framework and support for socially vulnerable groups
S6. Social cohesion	S6.1 Urban food production and community gardening
	S6.3 Number of sales points in short supply chains (SSC)
S7. Food security	S7.1 Affordability of food and food price inflation
	S7.2 Geographic accessibility to diverse food retailers and food deserts
	S7.3 Food insecurity and reliance on food aid
	S7.4 Brussels' food self-sufficiency rate

4 Results

4.1 Environmental footprint of Brussels' food demand

The Good Food 2 strategy highlights the importance of indirect greenhouse gas emissions in the Brussels-Capital Region. In 2013, total emissions amounted to 23.8 Mt CO_2e, of which 79% (18,7 Mt CO_2e) were indirect emissions (Figure 3). These indirect emissions were mainly associated with imported goods and services (68%), followed by energy production and other sources (16%), and food production (15%). The latter category includes emissions from agricultural production, as well as transport and processing (Bruxelles Environnement, 2021). These figures provide regional context, and are not directly comparable with the agricultural-production estimates presented below.

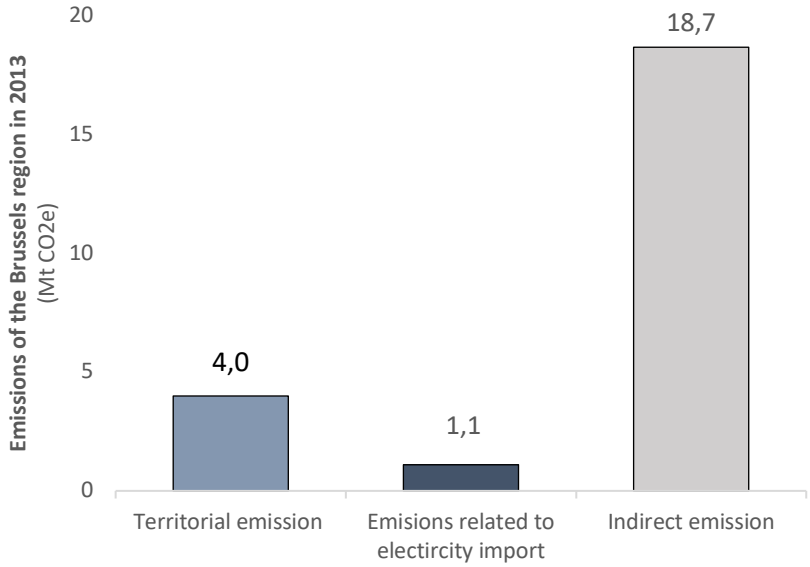


Figure 3: *Direct and indirect emissions of BCR in 2013, as presented in the Good Food Strategy 2 (Bruxelles Environnement, 2021).*

The PARCEL and SYTRA tools were used to estimate the selected environmental pressures associated with the food demand of Brussels residents. The assessment covers the resident population only. Food consumption by commuters and tourists is not included because corresponding dietary data were not available. The simulations use the dietary, organic-consumption and food-waste assumptions specified for the current situation in each model.

The comparison focused on agricultural land use, greenhouse-gas emission and soybean-related land demand. Soybean demand is treated as indirect proxy for potential pressure associated with imported food and biodiversity loss. The results are presented in Table 3.

Table 3: Comparison of outcomes between the PARCEL tool and the SYTRA tool.

Environmental indicator	PARCEL Wallonia	SYTRA Tool	Difference between both tools
Land use			
Total area (ha)	137.271	**156.556**	+14%
Share for animal products (%)	83%	**82%**	-1%
GHG emissions			
Total emissions (kt CO_2e/year)	1.182	**1.008**	-15%
Biodiversity			
Imported soybean (ha)	21.610	**23.297**	+8%

Taken together, the models outputs indicate that the food demand of Brussels residents requires approximately 137.000 - 157.000 hectares of agricultural land, more than 80% of which is linked to animal products. It also generates an estimated demand for 21.600 – 23.300 hectares of soybean cultivation and approximately 1.000 – 1.200 kt CO_2e in annual greenhouse gas emissions. Although the estimates differ between the two models, they indicate similar orders of magnitude.

These estimates provide a more specific assessment of emissions associated with agricultural production than the figure presented in the Good Food Strategy 2. The strategy estimate of approximately 2.805 kt CO2e includes agricultural production, transport and processing, whereas the PARCEL and SYTRA estimates reported here focus on agricultural production as represented in the models. The figures therefore have different system boundaries and should not be interpreted as contradictory or directly interchangeable.

The tools also provide additional insights into environmental pressures, including indicators related to biodiversity and soil quality. For instance, the PARCEL tool states that the current situation contributes to biodiversity impacts with 45% of birds species having disappeared in Europe since 1970, and to poor soil quality with 90% of cultivated land in Belgium lacking organic matter. Regarding biodiversity, the SYTRA tool calculates a biodiversity damage score expressed in potential species loss. The latter indicator can be used as a benchmark for comparing future scenarios, as explored in Q4. In addition, a technical assessment by the Belgian Climate Risk Assessment Centre (cerac, 2025) highlights risks to Belgian food production associated with pollinator decline. The present assessment does not quantify Brussels dependence on pollination services.

The results presented in Table 3 provide a model-based baseline for comparison with the alternative scenarios developed in Q4. They allow the project to examine how changes in diets, food waste and the share of organic products may influence selected environmental pressures.

4.2 Food waste

Food waste is an important issue in the environmental sustainability of the Brussels food system, as its reduction can help limit resource use and the environmental impacts associated with food production and consumption. Reducing avoidable food waste can therefore reduce upstream resource use and emissions, although the scale of the benefit depends on where waste occurs and which foods are concerned.

Available estimates suggest that Brussels residents waste approximately 15-19 kg of food per person per year (ACR+, 2022), The regional evaluation indicates that household food waste has remained relatively stable, making it uncertain whether the targets of a 5% reduction by 2023 and a 20% reduction by 2030, relative to 2018, will be achieved. The food industry has also set a target of reducing food waste by 30% by 2030 (De Vreese, 2025).

Table 4 presents the available indicators on waste generation, food waste and waste recovery in the Brussels-Capital Region.

Table 4: *Selected indicators related to waste generation, food waste and waste recovery in the BCR.*

E5 Exceeding ecosystems' capacity	Total volume of waste in the city region (trend)	**Total: 2 149 kT** • Construction and demolition waste: 1 297 kT • Municipal waste: 637 kT • Waste management and water treatment waste: 150 kT • **Agricultural, fishing, food processing, and preparation waste: 28 kT** • Medical and veterinary waste: 10 kT • Industrial waste: 4 kT • Other waste: 24 kT
	Total volume of waste economic value and percentage of food lost & wasted along the food chain in the city region	• Food waste at the household level is estimated to be of 15-19 kg/pers/year (2019) and would be equivalent to approx. 300 euro (ACR+, 2022) • **Food waste at the industrial level: 10 kT (**Bruxelles environnement)[7]
	Waste recovery at different levels of the food chain	• 33,3% of municipal waste is recycled or prepared for reuse (211,863 tonnes) • 40% of households waste is recycles or prepared for reuse

Source: Bruxelles Environnement, (ACR+, 2022)

[7] Réduire mon gaspillage, Bruxelles Environnement: https://environnement.brussels/citoyen/lenvironnement-bruxelles/agir-eco-responsable/reduire-mon-gaspillage-alimentaire

5 Socio-economic assessment of the Brussels food system

The final assessment comprises twenty socio-economic indicators, selected through an iterative process drawing on existing sustainability frameworks. Together, these indicators document key socioeconomic issues identified in the Sustainability Compass. The following sections present the main findings and trends across the seven themes covered by the assessment.

5.1 S1 – Human health

The indicators related to human health reveal a mixed picture. While a growing share of Brussels residents report reducing their meat consumption and meeting fruit and vegetable intake recommendations, overall dietary habits remain below recommended levels. At the same time, overweight and obesity continue to affect a substantial share of the population.

5.1.1 S1.1 - Prevalence of overweight and obesity

According to the 2022-2023 national health survey, 58% of the adult population in Brussels is affected by overweight or obesity (Drieskens et al., 2025). The prevalence of overweight and obesity among adults has increased over the past 22 years. In contrast, the figures for young people show a slight decline, particularly in obesity prevalence. Nevertheless, projections for Belgium and Western Europe indicate that overweight and obesity rates may continue to rise towards 2050 (Table 5 and Table 6).

Table 5: *Values and trends for socio-economic indicator S1.1*

Indicator	Value	Date of data	Evolution	Timeframe (years)
Overweight prevalence (BMI ≥ 25, Brussels population +18)	44%	2023	+3,8 %	22
Overweight prevalence among young people (BMI ≥ 25, Brussels population 2-17)	24%	2023	-1,1 %	22
Obesity prevalence (BMI ≥ 30, Brussels population +18)	14%	2023	+1,8 %	22
Obesity prevalence among young people (BMI ≥ 30, Brussels population 2-17)	5,5%	2023	-5,7 %	22
Average BMI in Brussels	25,2	2023	+0,5%	22

Table 6: *Estimated standardized prevalence of overweight and obesity among >25 years old in Occidental Europe and Belgium, in 1990, 2021 and 2050.*

Year	Occidental Europe		Belgium	
	Women	Men	Women	Men
1990	40%	50%	39%	42%
2021	55%	64%	56%	59%
2050	66%	73%	67%	70%
From 1990-2021	*+36%*	*+27%*	*+45%*	*+41,2%*
From 2021-2050	*+20%*	*+14%*	*+20%*	*19,4%*

Source: (Drieskens et al., 2025)

5.1.2 S1.2 – Plant-based protein consumption

Meat consumption in Brussels remains above dietary recommendations. Average consumption of red meat reaches 438 g per week, compared with the recommended maximum of 300 g, while processed meat consumption reaches 83 g per day, compared with a recommended maximum of 30 g, as documented by Vermeiren et al. (2025). However, dietary habits appear to be changing: 70.7% of Brussels residents report having reduced their meat consumption over the past five years, and 50.9% consume legumes or plant-based protein alternatives at least once a week. Health is the most frequently cited reason for reducing meat consumption, followed by animal welfare, environmental concerns and financial considerations (AQrate, 2023) (Table 7).

Table 7: *Values and trends for socio-economic indicator S1.2*

Indicator	Value	Date of most recent data	Evolution	Timeframe (years)
Percentage of the population who identify as omnivores	87,6%	2023	-0,40 %	3
Non-meat eaters (vegetarian or vegan) share in Brussels resident	5,1%	2023	+2,10 %	3
Brussels residents consuming legumes or plant-based protein alternatives at least once a week	50,9%	2023	+20,90 %	3
Brussels residents reducing their meat consumed over the past 5 years	70,7%	2023	+19,70 %	3
Main reasons for the decrease in meat consumption	Health	2023	*No multiannual data*	

Source: (Vermeiren et al., 2025), AQ-Rate (AQrate, 2020, 2023)

5.1.3 S1.3 – Adherence to dietary recommendations

Recent data show some progress in fruit and vegetable consumption. In 2023, 37.8% of residents aged six and above met the recommendation of two daily portions of fruit, while 46.4% met the recommendation for vegetables. Both figures have increased over the previous five years. Nevertheless, only around one in four adults in Brussels fully meets dietary recommendations across all food groups. Improving access to affordable and appealing healthy food options therefore remains important (Vermeiren et al., 2025) (Table 8).

Table 8*: Values and trends for socio-economic indicator S1.3*

Indicator	Value	Date of most recent data	Evolution	Timeframe (years)
Percentage of the population (aged 6+) who consume the recommended 2 daily portions of fruits	37,8%	2023	+5,60 %	5
Percentage of the population (aged 6+) who consume the recommended 2 daily portions of vegetables	46,4%	2023	+6,60 %	5
Percentage of the population consuming fruit daily	62,6%	2023	+0,20 %	10
Percentage of the population consuming vegetables daily	69,4%	2023	-6,50 %	10
Brussels residents consuming meat or fish daily	54,5%	2023	+2,50 %	3
Brussels residents consuming meat or fish less than daily	40,4%	2023	+4,40 %	3

Source: Sciensano

5.2 S2 – Working conditions and labour rights

The Brussels agri-food sector represents a significant economic activity, with nearly 12,000 companies across food production, processing, wholesale, retail and hospitality. However, the available indicators also point to employment-related vulnerabilities, particularly the high share of temporary contracts and working conditions. Company counts and employment figures describe the scale and structure of activities, as they do not establish job quality or economic resilience on their own.

5.2.1 S 2.1 - Employment in the agri-food sector

In 2023, the available sources recorded 639 companies active in food production and processing in Brussels, around 7% more than four years earlier. Employment in these activities declined by approximately 5%, to 4,493 employees (Hub.brussels). The hospitality sector represents the largest number of food-related businesses in the region, followed by food retail and wholesale (Table 9). However, the counts should be interpreted with care due to differences in sector definitions.

The hospitality sector is particularly important in the Brussels economy[8] and has experienced pressures since the COVID-19 period (Perspective Brussels & Citydev, 2024). The available evidence however suggests that the sector's size should not be equated with economic stability, as business numbers, employment, and turnover capture different dimensions of performance.

Table 9: *Values and trends for socio-economic indicator S2.1*

Data	Value	Date of most recent data	Evolution	Timeframe (years)
Number of companies engaged in food industry (per segment) [1]:				
- Horeca	7 084	2023	*No multiannual data*	
- Retail	3 129			
- Wholesale	910			
- Processing	620			
- Production	140			
Number of companies in Brussels agri-food sector (production and processing) [2]	639	2023	+7,04 %	4
Number of employees in Brussels agri-food sector (production and processing) [2]	4 493	2023	-5,11 %	4

Source: Statbel, Hub.brussels

[8] Based on data from ONSS in 2022. More detailed information in Q1- How does the Brussels food system operate?, available on www.sytra.be

5.2.2 S2.2 - Employment contracts

Temporary contracts account for 31.3% of employment in the Brussels agri-food industry, compared with 9.4% across all sectors in the region. The available data for the agricultural sector indicate that all 22 recorded employees had temporary contracts. This difference suggests a higher prevalence of temporary employment in the selected agri-food categories, but the figures should be interpreted in light of the sector classification and the small agricultural employee count (Table 10).

Table 10: *Values and trends for socio-economic indicator S2.2*

Indicator		Value	Date of most recent data
Employment contract types in the agri-food industry sector in BCR	Permanent contract	68,7% (3068 employees)	2023 (average 21-23)
	Temporary contract	31,3% (1395 employees)	
Employment contract types in the agricultural sector in BCR	Temporary contract	100% (22 employees)	2023 (average 21-23)
Employment contract types in all sectors in BCR (for comparison)	Permanent contract	90,6% (658 226 employees)	2023 (average 21-23)
	Temporary contract	9,4% (68 528 employees)	

Source: Statbel, Hub. Brussels

Note: No multiannual data

5.2.3 S2.3 - Atypical working hours

Saturday work affects 29.3% of employees in the Brussels agri-food sector, broadly in line with the regional average of 27.7%. Night, evening and Sunday work are less common in the agri-food sector than across all sectors in Brussels. These figures describe the timing of work, but do not by themselves indicate whether schedules are voluntary, adequately compensated or compatible with workers' well-being (Table 11).

Table 11: *Values and trends for socio-economic indicator S2.3*

Indicator		Value	Date of most recent data
Employees with atypical working hours in agri-food sector in BCR	Night work (11 pm to 5 am)	2,8% (98 empl.)	2023 (average 21-23)
	Evening work (7 pm to 11 pm)	10,8% (357 empl.)	
	Saturday work	29,3% (965 empl.)	
	Sunday work	8,0% (265 empl.)	
Employees with atypical working hours in all sectors in BCR (for comparison)	Night work (11 pm to 5 am)	8,1% (55 025 empl.)	2023 (average 21-23)
	Evening work (7 pm to 11 pm)	31,7% (215 344 empl.)	
	Saturday work	27,7% (188 235 empl.)	
	Sunday work	17,5% (118 876 empl.)	

Source: Actiris

Note: No multiannual data.

5.3 S3 – Decent income

The available indicators suggest that income levels vary considerably across activities within the Brussels agri-food sector. While average salaries in parts of the food industry and wholesale sector are relatively high, hospitality and transport and logistics offer lower average wages. At the same time, growth in food-industry turnover has not necessarily removed the economic challenges experienced by sector representatives.

5.3.1 S3.1 – Average income

In 2020–2022, average gross monthly salaries in the Brussels agri-food industry were higher than the Belgian sector average. For employees with less than five years of experience, the average salary was €4,200 in Brussels, compared with €3,400 nationally. For employees with more than ten years of experience, the respective figures were €4,600 and €4,200. However, salaries differ across activities: hospitality and transport and logistics generally offer lower wages, while wholesale offers higher average salaries (Table 12)[9].

Table 12: *Values and trends for socio-economic indicator S3.1*

Indicator		Value	Date of most recent data
Average income in agrifood industry in BCR vs agrifood industry in Belgium - less 5 years' experience	BCR	4 200€	2022 (average 20-22)
	Be	3 400€	
Average income in agrifood industry in BCR vs agrifood industry in Belgium - more 10 years' experience	BCR	4 600€	2022 (average 20-22)
	Be	4 200€	

Source: Actiris

Note: Those salaries were calculated over 2020-2022 and consequently do not integrate the recent indexation.

5.3.2 Indicator S3.2: Turnover of the food industry

Turnover in the Brussels food industry, excluding beverages, increased by 37.2% between 2016 and 2022 according to FEVIA data. The reported turnover for 2022 was €935.9 million. Hub.brussels reports a higher figure of €1.7 billion, although the available sources do not explain this discrepancy. Despite the overall growth, representatives of the sector continue to report economic challenges (Table 13).

Table 13: *Values and trends for socio-economic indicator S3.2*

Indicator	Value	Date of most recent data	Evolution	Timeframe (years)
Turnover of the food industry (excluding drink industry)	935,9 million euro [1] – 1,7 billion euro [2]	2022	+37,23%	6

Source: FEVIA, 2022[10] ; [2] Hub.Brussels[11]

[9] Actiris, website consulted in september 2025, https://panorama.actiris.brussels/fr/recherche/industrie-agro-alimentaire/conditions-de-travail#salaires

[10] FEVIA: Chiffres clés par secteur: https://www.fevia.be/fr/actualites/chiffres-cles-par-secteur-actualisation-3

[11] https://hub.brussels/fr/le-secteur-alimentaire-a-bruxelles-toujours-solide-et-en-croissance/

5.4 S4 – Socio-economic inequalities

Socio-economic inequalities are particularly pronounced in the Brussels-Capital Region, where a substantial share of the population faces poverty or social exclusion. These inequalities also affect households' ability to spend on food and may influence their access to and choices around food. The indicators below describe some of these conditions but do not establish causal relationships between poverty and specific dietary outcomes.

5.4.1 S4 - Poverty risk rate in Brussels

In 2024, 26,3% Brussels residents are at risk of monetary (AROP), while 37,3% of Brussels residents are at risk of poverty or social exclusion (AROPE). The latter figure represents a limited decrease of 1.7% over the previous five years (Table 14). Both rates are substantially higher than the Belgian averages, which stood at 11,4% for AROP and 18,3% for AROPE (Statbel)[12].

AROPE covers three dimensions of vulnerability: monetary poverty, low work intensity within the household, and severe material and social deprivation. The latter refers to the inability to afford certain goods and services considered necessary for an acceptable standard of living. In 2024, the BCR had the highest AROPE rate of the three Belgian regions, highlighting the persistent socio-economic vulnerability of its population.

Table 14: *Values and trend for socio-economic indicator S4.1*

Indicator	Value	Date of most recent data	Evolution	Timeframe (years)
Share of Brussels residents at risk of (monetary) poverty (AROP)	26,3%	2024	*No multiannual data*	
Share of Brussels residents at risk of poverty or social exclusion (AROPE EU2030)	37,3%	2024	-1,70 %	5

Source: Statbel, period 2019-24

5.4.2 S4.2 - BIM beneficiaries

The number of Brussels residents benefiting from increased assistance under compulsory health insurance (BIM - *bénéficiaire d'intervention majorée*)[13] has increased substantially over the past thirteen years. In 2023, 344.144 residents held this status, representing an increase of 55,93% (Table 15). Brussels has a higher number of BIM beneficiaries than the two other regions.

The BIM status provides increased public reimbursement for healthcare and is also associated with certain social benefits, including family allowances and reduced public transport costs. Eligibility is based on specific socio-economic circumstances and income criteria. The increase in beneficiaries occurred in two main waves: in 2017, following changes to the eligibility conditions, and during the COVID-19 period in 2020-2021. The growing share of young people among beneficiaries is a particular cause for concern.

[12] Statbel, Risk of poverty or exclusion: https://statbel.fgov.be/fr/themes/menages/pauvrete-et-conditions-de-vie/risque-de-pauvrete-ou-dexclusion-sociale

[13] The BIM Status: https://statut-bim.be/

Table 15: Values and trend for socio-economic indicator S4.2

Indicator	Value	Date of most recent data	Evolution	Timeframe (years)
Number of BIM beneficiaries in Brussels	344 144	2023	+55,93 %	13

Source: IBSA, 2024

5.4.3 S4.3 - Income disparity in food spending

Differences in income are also reflected in household food expenditure. In 2022, households in the highest income quartile (Q1) spent 82% more on food than those in the lowest income quartile (Q4) (Table 16). The relative distribution across food categories remained broadly similar between income groups, although higher-income households spent considerably more on restaurants and canteens.

As discussed in the description of the Brussels food system in Q1, this difference suggests that income disparities are reflected particularly in the overall amount households can spend on food, rather than necessarily in the types of products purchased. However, factors such as food quality, labelling and origin may also influence purchasing decisions. Their relationship with income and diet-related health inequalities would require further investigation.

Table 16: Values and trend for socio-economic indicator S4.3

Indicator	Value	Date of most recent data
Food expenditure gap between highest vs lowest income quartiles (Q4/Q1)	82%	2022

Source: Statbel, 2024, Question 1 of BRUFO2050

5.5 S5 – Food democracy

Food democracy concerns residents' awareness of and participation in the food system, as well as their ability to access diverse and sustainable food options. The indicators show widespread engagement in some sustainable food practices, but also highlight persistent barriers related to price and unequal access to sustainable food outlets. Policy frameworks are in place, although their implementation and support for vulnerable groups remain important challenges.

5.5.1 S5.1 - Public engagement and awareness on sustainable food system issues

Engagement in sustainable food practices is relatively high among Brussels residents. In 2023, 97% reported taking at least one measure to reduce food waste, while many also reported eating homemade food (79%), seasonal food (73%) and food produced in Belgium (65%) (Table 17). However, only 45% reported eating little or no meat. Awareness of the link between food choices and climate change stood at 63.3%, down 13.7% over three years. Price remains the main reported barrier to more sustainable food consumption, cited by 75% of respondents.

Other barriers include the inconvenience of having to visit several shops, limited product choice, lack of nearby outlets and difficulty identifying sustainable products. At the same time, 63.7% of residents consider local sourcing important when purchasing food.

Table 17: Values and trends for socio-economic indicator S5.1

Indicator	Value	Date of most recent data	Evolution	Timefr ame (years)
Consumer awareness on food waste, claim to pay special attention to food waste reduction (% of Brussels residents who already take at least one measure to combat food waste)	97%	2023	+28,00 %	3
Share of residents adopting sustainable eating behaviour (systematically and/or frequently) :		2023	*Only qualitative comparison possible**	
- Eating leftovers the next day or the day after	78%			
- Eating homemade food	79%			
- Eating seasonal food	73%			
- Eating food produced in Belgium	65%			
- Eating little or no meat	45%			
Main barriers to sustainable food - Price ("it's too expensive")	75%	2020	*Only qualitative comparison possible**	
People awareness of food impact on climate: share of Brussels residents aware that food choices have an impact in the fight against climate change	63,3%	2023	-13,70 %	3
Percentage of Brussels resident considering it is important that the food products they buy are locally sourced	63,7%	2024	*No multiannual data*	

Source: AQ-Rate and SPF economy

Note: Only qualitative comparison possible, as data categories differ between survey years.

5.5.2 S5.2 - Equitable access to diverse and sustainable food outlets

In 2023, 44% of Brussels residents reported having access to an organic or sustainable food shop within a 10–15-minute walk from their home. This represents a decrease of 26% over three years (Table 18). Access also varies considerably between municipalities, from 17% in Saint-Josse-ten-Noode and 18% in Koekelberg to 65% in Woluwe-Saint-Lambert and 66% in Uccle (Table 19). These differences point to significant spatial inequalities in access to sustainable food outlets.

The reasons for the overall decline in reported access are not established by the available data and would require further investigation.

Table 18: Values and trends for socio-economic indicator S5.2.

Indicator	Value	Date of most recent data	Evolution	Timeframe (years)
Availability of sustainable products in Brussels (Brussels residents having access to organic or sustainable food stores within a 10–15 minutes' walk from their home)	44%	2023	-26,00 %	3
Availability of sustainable products in Brussels (Brussels residents having access to organic or sustainable food stores within a 10–15 minutes' walk from their home) by municipality	See Table 19	2023	*No multiannual data*	

Source: AQ-Rate

Table 19: *Share of residents with easy access to sustainable food shops, by Brussels community.*

Brussels communes	% residents
Saint-Josse-ten-Noode	17%
Koekelberg	18%
Molenbeek- Saint-Jean	22%
Anderlecht	30%
Evere	36%
Watermael- Boitsfort	36%
Schaerbeek	38%
Total	44%
Jette	44%
Bruxelles	45%

Brussels communes (continued)	% residents
Berchem- Saint-Agathe	48%
Ganshoren	49%
Ixelles	49%,
Woluwe- St-Pierre	49%
Forest (Brussels Capital city)	52%
Auderghem	53%
Saint- Gilles	56%
Etterbeek	56%
Woluwe-St-Lambert	65%;
Uccle	66%

5.5.3 S5.3 - Policy framework and support for socially vulnerable groups in the food system

The Brussels-Capital Region has several policy strategies and instruments addressing food environments and social vulnerability. The inventory identifies six policy strategies and fourteen policy instruments in this area (Table 20). Nevertheless, access to healthy and sustainable food remains difficult for many vulnerable residents, and several policy recommendations have yet to be implemented (De Bauw et al., 2025).

Food aid organisations rely partly on informal networks of food donations, while the legislative framework supporting these activities remains limited. A measure requiring large supermarkets (over 1,000 m²) to donate unsold food was validated in 2024 but had not yet been voted on at the time of the assessment. The recommendations listed in Table 20 also point to opportunities to strengthen food policies, including through better coordination between policy levels, stronger nutritional criteria in the Good Food label and financial support for access to healthy and sustainable food.

Table 20: Values and trends for socio-economic indicator S5.3

Indicator	Value	Date of most recent data
Legislation on unsold food donations	One (Legislation requiring donations by major supermarkets over 1000 m^2; validated in 2024, still to be voted)	2024
Number of policy instruments on food environment	Fourteen[14]	2025
Number of policy strategies on food environment	Six [14]	2025
Key recommended action on policy strategies on food environment	1. Safeguard an exemption of subsidies for industries producing unhealthy and unsustainable foods, 2. Expand the criteria for the Good Food label to also include nutritional standards, 3. Establish a platform for exchange on environmental and health policies between different jurisdictions in Brussels – the region BCR and communities 4. Establish social security budget for food with criteria for healthy, sustainable products for BCR citizens	2025

Source: Sciensano, De Bauw et al. (2025)

Note: No multiannual data available.

5.6 S6 – Social cohesion

Social cohesion in the Brussels food system is supported by community gardening, urban agriculture and initiatives that connect consumers more directly with producers. These activities provide opportunities for participation and local exchange, although their contribution to the region's overall food supply remains limited.

5.6.1 S6.1 - Urban food production and community gardening

Community gardening and urban agriculture are well established in the Brussels-Capital Region. The number of collective vegetable gardens increased by 30.2% over five years, reaching 392 in 2018. Professional urban agriculture also expanded: between 2018 and 2022, the area used by projects increased by 130%, while estimated production volume doubled to 470 tonnes (Table 21).

Despite this growth, urban food production remains limited in volume. The availability of suitable land is a major constraint on further expansion. Moreover, the share of residents reporting that they grow herbs, vegetables or fruit decreased by 7% between 2020 and 2023.

[14] See Q1 for more information on the legal environment of the food system, based on De Bauw et al. (2025).

Table 21: Values and trends for socio-economic indicator S6.1.

Indicator	Value	Date of most recent data	Evolution	Timeframe (years)
Share of population growing herbs[1]	42%	2023	-7,00 %	3
Share of population growing vegetables and fruits[1]	33%	2023	-7,00 %	3
Area of professional urban agriculture projects (ha)[2]	46	2022	+130,00 %	4
Estimated production volume in urban agriculture projects (t)[2]	470	2022	+100,00 %	4
Number of urban agriculture projects[2]	53	2022	+32,50 %	4
Number of collective vegetable gardens	392	2018	+30,23 %	5

Source :[1]Leefmilieu Brussel; [2] FEDEAU

5.6.2 S6.2 - Number of sales points in short supply chains (SSC)

Short supply chains connect Brussels consumers more directly with producers, notably through solidarity-based purchasing groups and public markets. In 2021, the region counted 94 GASAP groups (*Groupes d'achat solidaires de l'agriculture paysanne*). In 2017, there were 59 market locations hosting 92 weekly markets. The number of market locations had increased by 156.5% over the previous fifty years (Table 22).

These initiatives provide opportunities for closer relationships between producers and consumers, although the available data do not indicate their overall share in Brussels food consumption.

Table 22: Values and trends of socio-economic indicator S6.2

Indicator	Value	Date of most recent data	Evolution	Timeframe (years)
Number of solidarity purchase groups (GASAP)	94	2021	No multiannual data	
Number of markets location in Brussel	59	2017	+156,52 %	50
Number of weekly markets in Brussel	92	2017	No multiannual data	

Source: Atrium Brussels (Hub.Brussels)

5.7 S7 – Food security

Food security in the Brussels-Capital Region is challenged by the cost of food, unequal access to food retailers and widespread food insecurity. The region also depends heavily on food supplies from outside its territory, reflecting its limited capacity for local food production.

5.7.1 S7.1 - Affordability of food and food price inflation

Food affordability has come under pressure from rising prices. Across Belgium, prices of unprocessed food products increased by 21.24% over the three-year period covered by the indicator. In 2024, grocery prices in Brussels were estimated to be 8.7% higher than in Ghent and 5.9% higher than in Namur (Table 23). These figures suggest that food costs may represent an additional challenge for Brussels households, particularly those with lower incomes.

Table 23: Values and trends of socio-economic indicator S7.1

Indicator	Value	Date of most recent data	Evolution	Timeframe (years)
Food price inflation for unprocessed food products, in Belgium	2,50%	2024	+21,24 %	3
Grocery price comparison Brussels vs Flanders and Wallonia	8,7% higher than Ghent; 5,9% higher than Namur	2024	No multiannual data	

Source: National Bank of Belgium (NBB); Numbeo, consulted in october 2025

5.7.2 S7.2 - Geographic accessibility to diverse food retailers and "food deserts"

Most Brussels residents have access to a supermarket within walking distance (82%), while 71% have access to neighbourhood shops (Table 24). Access is lower for other types of food outlets: 55% for hard-discount stores, 51% for night shops, 37% for markets and 36% for ethnic shops. Only 44% have access to an organic or sustainable food shop within walking distance.

These figures show that access to food retailers varies according to shop type. In particular, access to sustainable food outlets is more limited and geographically uneven, as also illustrated by the municipal differences presented under indicator S5.2.

Table 24: Values and trends for socio-economic indicator S7.2

Indicator	Value	Date of most recent data
Proximity of food retailers within walking distance (share of resident having access to each type of shop)		
- Supermarkets	82%	2023
- Neighbourhood shops	71%	
- Hard discount stores	55%	
- Night shops	51%	
- Markets	37%	
- Ethnic shops	36%	
- Organic/sustainable shops	44%	

Source: AQ-rate

Note: No multiannual data

5.7.3 S7.3 - Food insecurity and reliance on food aid

Food insecurity affects a substantial share of the Brussels population. In 2024, 20.2% of residents aged 10 and over reported being unable to afford a healthy diet, while 16% said that the food they had bought did not last and that they lacked the money to buy more. An estimated 90,000 people, or around 7% of the regional population, relied on food aid. This represents an increase of 63.6% over eight years (Table 25).

The available figures point to significant needs, but regular monitoring of food insecurity remains lacking. Sciensano's estimates are based on survey data rather than a recurring regional monitoring system. Food aid organisations, including the Fédération des Services Sociaux (FdSS), therefore call for both improved emergency food assistance and more structural measures to guarantee access to good-quality food. Their proposals include strengthening the supply and logistics of food aid organisations, developing free canteens with quality food in educational settings, and supporting initiatives that help realise the right to food.

Table 25: *Values and trends for socio-economic indicator S7.3*

Indicator	Value	Most recent data	Evolution	Timeframe (years)
Proportion of adolescents and adults aged 10 years and older that indicate food insecurity (share (%) of Brussels residents who cannot afford a healthy diet)	20,2%	2024	No multiannual data	
Proportion of adolescents and adults aged 10 years and older that indicate food insecurity (share (%) of Brussels residents who report that the food they bought did not last and they did not have money to buy more)	16,0%	2024	No multiannual data	
Food aid dependence: number of people relying on food aid in Brussel	90 000	2024	+63,64 %	8

Source: Sciensano[15], Fédération des Services Sociaux asbl

Note: The Sciensano results on food security have been extracted from Bel et al. (2022). The analysis of food insecurity requires specific survey and is not led on a regular basis. This lack of regular data collection is considered as problematic by the association of the sector (Brusano, 2025).

5.7.4 S7.4 - Brussels' food self-sufficiency rate

The BCR is an “eating territory”, heavily dependent on other territories for its food supply. In terms of food sovereignty of the region, the rate is low (estimated at 0,3% ; Table 26), and this rate is not expected to change, even with extremely supporting policies, as land available for production is limited. However, in terms of food security, beyond the production, monitoring the commercial relationships and flows of volume of goods with the two other regions would provide a valuable indicator. Unfortunately, those flows are not documented by NBB nor by another administration.

Table 26: *Values and trend for socio-economic indicator S7.4*

Indicator	Value	Date of most recent data
Self-sufficiency ratio (for fruits, vegetables, potatoes, milk and dairy products)	0,30%	2020

Source: (Riera et al., 2020)

Note: Result from a preliminary study on the Brussels food self-sufficiency, with a limited scope on a certain number of food products. No Multiannual data.

[15] Sciensano. Déterminants des choix alimentaires : Sécurité alimentaire, Enquête de Consommation alimentaire 2022-2023, juin 2024, Bruxelles, Belgique, https://www.sciensano.be/fr/resultats-de-lenquete-nationale-de-consommation-alimentaire-2022-2023/determinants-des-choix-alimentaires/securite-alimentaire

6 Discussion

The Q2 sustainability assessment provides an initial overview of the environmental and socio-economic sustainability of the Brussels food system. It highlights a substantial environmental footprint associated with the food consumption of Brussels residents. Much of the associated agricultural land use and greenhouse-gas emissions occurs beyond the regional borders, reflecting Brussels' strong dependence on food produced elsewhere. This is consistent with research showing that the largest contribution of food systems' greenhouse-gas emissions comes from agriculture and land-use activities (Crippa et al., 2021; Poore & Nemecek, 2018).

The model results suggest that animal products account for approximately 80% of the agricultural land requirement associated with Brussels' food demand. This is in line with research showing that animal-based foods generally have higher environmental impacts than plant-based alternatives (Poore & Nemecek, 2018). The composition of the diet is therefore an important driver of the environmental footprint. The assessment also points to a mismatch between current consumption patterns in Brussels and the Belgian dietary recommendations (Superior Health Council (of Belgium), 2025), particularly regarding meat consumption. This underlines the potential importance of dietary change, including a shift towards more plant-based diets, in reducing the environmental impact of Brussels' food demand. The EAT-Lancet Commission similarly advocates healthy and sustainable diets that are predominantly plant-based, while allowing for moderate consumption of animal-based products (Willett et al., 2019).

At the same time, the socio-economic indicators point to important vulnerabilities, especially in relation to food insecurity and unequal access to affordable, healthy and sustainable food. High levels of poverty and social-exclusion, reliance on food aid and reported barriers to accessing sustainable food options suggest that affordability and access are central challenges for the Brussels food system. These challenges cannot be understood solely in terms of individual consumer choices. They are also shaped by broader structural conditions, including household income, food prices and the physical and economic accessibility of healthy and sustainable food options (Drewnowski et al., 2020; HLPE, 2017). The findings therefore point to the importance of considering the social conditions that shape people's ability to access adequate and sustainable food.

To bring these findings together, the indicators were translated into a color-coded assessment (Figure 4). This offers an accessible overview of areas where the Brussels food system performs relatively well and where challenges remain. However, translating a diverse set of indicators into a common color scale is not straightforward. Indicators differ in their nature, geographical scope, data availability and reference points. The resulting colours should therefore be understood as a tool for synthesis and reflection, rather than as a definitive or comprehensive rating of the food system.

Interpreting the results is also challenging because there are few directly comparable cities against which to assess Brussels, particularly cities with similar demographic, socio-economic and territorial characteristics. The assessment consequently does not establish how Brussels performs relative to an equivalent urban context. Instead, it identifies key issues and provides a structured overview of the available evidence.

Furthermore, the descriptive approach in this report makes it difficult to determine the absolute sustainability status of the Brussels food system. The use of sustainability objectives and

targets helps to contextualise the results and indicate the changes required, but such reference points are not available for all indicators. Comparisons with the other Belgian regions or with other cities could provide additional insights into Brussels' relative performance. Another limitation is that the supply-side dimension is less extensively covered in the present assessment. Indicators such as the share of organic farming in agricultural production, the share of organic products in retail and the relative presence of sustainable and unsustainable food-chain actors and services could provide relevant complementary information. Some of these aspects were already explored in the Q1 report and can be further considered in the subsequent BRUFO2050 research questions.

This report should therefore be seen as a baseline for further analysis of the Brussels food system. It helps identify areas that require attention, highlights gaps in the available data and provides a starting point for monitoring how the food system evolves over time. Future assessments could strengthen this baseline by improving data collection, refining the indicators and exploring meaningful comparisons with other urban contexts. Together, these insights can inform the subsequent BRUFO2050 research questions by helping to identify the barriers to a more sustainable food system and by providing a basis for exploring possible future pathways.

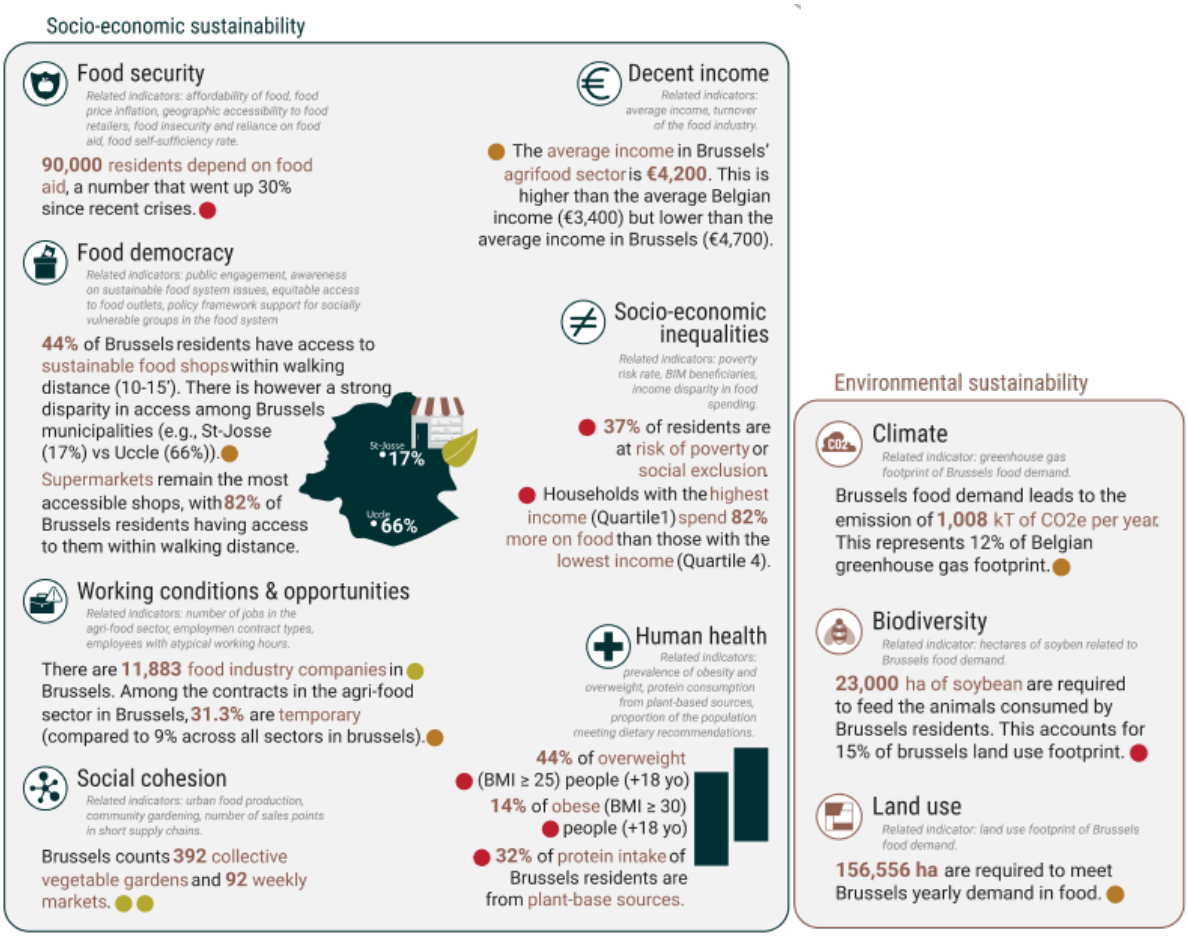


Figure 4: *Summary visual of key socio-economic and environmental sustainability indicators.*

Conclusion

This report assessed the sustainability of the Brussels food system by developing and applying an indicator framework based on the Sustainability Compass. Drawing on seven existing sustainability frameworks, the assessment brought together environmental and socio-economic indicators to establish a baseline of selected sustainability dimensions. The results provide an overview of important pressures, vulnerabilities and developments, while also highlighting gaps in the available evidence.

The environmental assessment shows that the food demand of Brussels residents is associated with substantial environmental pressures beyond the regional boundaries. The results underline the importance of considering the impacts embedded in food consumption and highlight the influence of dietary patterns, particularly the consumption of animal products, on the environmental footprint of the food system. Food waste represents an additional challenge. However, the assessment covers only selected environmental pressures, and some impacts, such as biodiversity loss, are represented indirectly rather than measured directly.

The socio-economic assessment reveals a mixed picture. Brussels has an active food sector and a range of initiatives supporting urban agriculture and short supply chains. There is also evidence of changing dietary practices. At the same time, important challenges remain regarding public health, employment-related vulnerabilities and socio-economic inequalities. Poverty, food insecurity and reliance on food aid highlight that access to healthy and sustainable food cannot be understood solely in terms of individual consumer choices. It is also shaped by structural conditions, including household income, food prices and the accessibility and affordability of food options.

Taken together, the results show that the sustainability of the Brussels food system involves interconnected environmental, social and economic challenges. Addressing these requires more than changes in consumer behavior AS attention must also be given to food production, supply chains, employment conditions, the wider food environment and public policy.

The assessment has several limitations. Environmental and supply-side data remain relatively limited, while the availability, geographical scope and reference years of indicators vary. Some themes lack suitable data, including animal welfare, which could not be assessed due to the absence of a Brussels-specific indicator or dataset. Moreover, the descriptive approach and limited availability of comparable urban assessments make it difficult to determine the system's absolute sustainability or compare it with similar cities. The color-coded synthesis should therefore be seen as an overview to support reflection, rather than a definitive sustainability rating.

Despite these limitations, the report provides an important baseline for the next stages of BRUFO2050. Its findings will inform the analysis of barriers and lock-ins in Q3 and support Q4, where selected environmental indicators will be used to explore the potential effects of alternative food-system scenarios. Together, these stages contribute to identifying possible pathways towards a more sustainable and resilient Brussels food system by 2050.

7 References

ACR+. (2022). *Actions de prévention du gaspillage alimentaire des ménages à Bruxelles*. https://goodfood.brussels/sites/default/files/inline-files/Rapport_GA_RBC_VF.pdf

AQrate. (2020). *Baromètre des comportements en termes d'alimentation durable dans le cadre de la stratégie GoodFood*.

AQrate. (2023). *Baseline Stratégie GoodFood 2*.

Bel, S., Moyersoen, I., Lebacq, T., Vasquez, M. S., Grimm, E., Vermeiren, S., Van Campenhout, E., le Dien, E., Boulbayem, L., De Ridder, K., & Berger, N. (2022). *Enquête de consommation alimentaire 2022-2023 : Rapport de synthèse sur la consommation alimentaire et le respect des recommandations alimentaires dans la population belge* [Text]. Sciensano. https://www.sciensano.be/fr/biblio/enquete-de-consommation-alimentaire-2022-2023-rapport-de-synthese-sur-la-consommation-alimentaire-et

Bourlakis, M. A., & Weightman, P. W. H. (2003). Preface. In *Food Supply Chain Management* (Blackwell edition, p. i-xix). John Wiley & Sons, Ltd. https://doi.org/10.1002/9780470995556.fmatter

Brusano. (2025). *L'insécurité alimentaire en lien avec le social-santé*. https://www.brusano.brussels/layout/uploads/2025/09/202509_insecurite-alimentaire.pdf

Bruxelles Environnement. (2021). *Stratégie Good Food 2022-2030*. https://goodfood.brussels/sites/default/files/inline-files/GF_A4_strat_FR_def_11.pdf

cerac. (2025). *BCRA Technical paper. Risk to food production due to pollinator decline*. https://www.cerac.be/sites/default/files/media/files/2025-11/Voeding/NL/TP/food-risk_to_food_production_due_to_pollinator_decline.pdf

Courtois, A.-M., Chevalier, C., Borniotto, Diana, Antier, C., & Baret, P. (2024). *Guidebook to mapping lock-ins*.

Crippa, M., Solazzo, E., Guizzardi, D., Monforti-Ferrario, F., Tubiello, F. N., & Leip, A. (2021). Food systems are responsible for a third of global anthropogenic GHG emissions. *Nature Food*, *2*(3), 198-209. https://doi.org/10.1038/s43016-021-00225-9

De Bauw, M., reybrouck, K., Mathijs, E., & Vandevijvere, S. (2025). *From fragmentation to transformation : Multi-level policy mixes for sustainable healhty food environments in Belgium*.

De Vreese, G. (2025). *La gestion des pertes et gaspillages alimentaires, un facteur de durabilité sociale ou économique : Cas d'étude : La filière de la viande en Région Bruxelles-Capitale*. https://hdl.handle.net/2078.2/43217

Drewnowski, A., Monterrosa, E. C., De Pee, S., Frongillo, E. A., & Vandevijvere, S. (2020). Shaping Physical, Economic, and Policy Components of the Food Environment to Create Sustainable Healthy Diets. *Food and Nutrition Bulletin*, *41*(2_suppl). https://doi.org/10.1177/0379572120945904

Drieskens, S., Charafeddine, R., & Boone, C. (2025). *Health Survey 2023-24*. Sciensano. https://www.sciensano.be/sites/default/files/ns_report_fr_his2023.pdf

FAO. (2014). *Sustainable food systems : Concept and framework*.

Fremault, C. (2015). *STRATEGIE GOOD FOOD « VERS UN SYSTÈME ALIMENTAIRE DURABLE EN RÉGION DE BRUXELLES-CAPITALE »*.

HLPE. (2017). *Nutrition and food systems*.

HLPE. (2020). *Food security and nutrition : Building a global narrative towards 2030*.

Hubeau, M., Marchand, F., Coteur, I., Mondelaers, K., Debruyne, L., & Van Huylenbroeck, G. (2017). A new agri-food systems sustainability approach to identify shared transformation pathways towards sustainability. *Ecological Economics*, *131*, 52-63. https://doi.org/10.1016/j.ecolecon.2016.08.019

IGEAT. (2019). *Projet Cosyfood, Rapport d'évaluation de la durabilité de trois systèmes alimentaires alternatifs Bruxellois Outil d'évaluation Principes, Critères, Indicateurs (PCI)*.

LeBASIC. (2021). *Diagnostic du système alimentaire des Hauts-de-France et de sa durabilité et de sa résilience*.

Moragues-Faus, A., Clark, J. K., Battersby, J., & Davies, A. R. (2024). The potential of urban food governance to transform lives, cities, and the planet. *Global Food Security*, *40*, 100751. https://doi.org/10.1016/j.gfs.2024.100751

Perspective Brussels, & Citydev. (2024). *Les espaces de production alimentaire à Bruxelles, Etat des lieux. Observatoir des activités productives*.

Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, *360*(6392), 987-992. https://doi.org/10.1126/science.aaq0216

Raworth, K. (2017). A Doughnut for the Anthropocene : Humanity's compass in the 21st century. *The Lancet Planetary Health*, *1*(2), e48-e49. https://doi.org/10.1016/S2542-5196(17)30028-1

Riera, A., Antier, C., & Baret, P. (2020). *Vers un approvisionnement alimentaire durable de la ville de Bruxelles : Possibilités dans et autour du contexte urbain*. Sytra - Earth and Life Institute - UCLouvain. https://sytra.be/fr/publication/nourrir-bruxelles/

Riera, A., Vandevoorde, N., Squilbin, A., Vandersteen, Q., & Baret, P. V. (2026). Narratives, trade-offs and scenarios to explore the livestock transition in Belgium. *npj Sustainable Agriculture*. https://doi.org/10.1038/s44264-025-00122-9

Superior Health Council (of Belgium). (2025). *Dietary recommendations for the Belgian population—2025*.

Vandersteen, Q., Amrom, C., & Baret, P. (2025). *Mise en contexte de simulations PARCEL-Wallonie : Perspectives, points de tension et cas d'étude*. Sytra - Earth and Life Institute - UCLouvain. https://sytra.be/wp-content/uploads/2025/04/mise-en-contexte-de-simulations-parcel-final.pdf

Vermeiren, S., Moyersoen, I., Bel, S., Lebacq, T., Versele, V., Vasquez, M. S., Grimm, E., Van Campenhout, E., le dieu, E., Boulbayem, L., De Ridder, K., & Nicolas, B. (2025). *Enquête de consommation alimentaire 2022-2023 : Consommation alimentaire et adhésion aux recommandations alimentaire en Région Bruxelles-Capitale* [Text]. Sciensano. https://www.sciensano.be/fr/biblio/enquete-de-consommation-alimentaire-2022-2023-consommation-alimentaire-et-adhesion-aux

Vervoort, Joost, Helfgott, A., & Lord, S. (2016). *Transition pathways* (p. 31). Transmango. https://transmango.wordpress.com/wp-content/uploads/2017/09/d3-3-transition-pathways-training-guide.pdf

Walker, B., Holling, C. S., Carpenter, S. R., & Kinzig, A. P. (2004). Resilience, Adaptability and Transformability in Social-ecological Systems. *Ecology and Society*, *9*(2), art5. https://doi.org/10.5751/ES-00650-090205

Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., Tilman, D., DeClerck, F., Wood, A., Jonell, M., Clark, M., Gordon, L. J., Fanzo, J., Hawkes, C., Zurayk, R., Rivera, J. A., De Vries, W., Majele Sibanda, L., … Murray, C. J. L. (2019). Food in the Anthropocene : The EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, *393*(10170), 447-492. https://doi.org/https://doi.org/10.1016/S0140-6736(18)31788-4

Appendix A – Review and selection of sustainability frameworks

Seven existing frameworks were reviewed, as summarised in Table A1. The comparison informed the selection of the Sustainability Compass (Le BASIC, 2021), which was adapted because it combines environmental and socio-economic dimensions in a structure that can be applied to a city-region. The review is comparative rather than a formal validation of the selected framework.

Table A1: *Comparison of seven sustainability frameworks.*

Scale	Approach	Indicator used	Practical	Comments
1) City Region Food System Toolkit, by FAO				
City region	7 areas of sustainability	Impact & state indicator	Low	Long with many indicators and dimensions. The evaluation requires specific interview or on field-survey
2) Agri-Food Systems Sustainability Approach (AFSSA), by KU Leuven				
Regional (Flanders)	7 forms of capital	Impact & state indicator	Low	The use of the seven capital requires specific introduction to it
3) Barometer of sustainable food system in Wallonia, by ICEDD and SYTRA				
Regional (Wallonia)	Specific	State indicator	Average	The tool is not yet finalized. Specific approach organized around 3 dimensions (Motor and impact, agency and activities) influencing the food system
4) Sustainability Doughnut applied to Brussels-Capital Region, by Confluence				
Regional (Brussels)	Doughnut approach	State indicator	high	Not specific to food system
5) Good Food Strategy, by Brussels-Environment				
Regional (Brussels)	-	Impact indicator	low	Strategy with some indicators not a proper evaluation framework
6) Sustainability referential, by Cosyfood project				
Value chain	14 sustainability principles	State indicator	low	Specific to food democracy evaluation. The evaluation requires specific interview or survey
7) Sustainability Compass, by Le BASIC				
Multiple scale	Doughnut approach	State indicator	high	Approach is known from the team and accessible. Limited number of themes. Existing practice on different territories.

Framework 1: The "City Region Food System Toolkit" (CFRS)

In 2017, FAO developed the City Region Food System Toolkit (CRFS) which includes a tool for sustainability evaluation and another for resilience evaluation. The sustainability assessment tool is quite extensive as it consolidates 210 indicators organized in six areas, namely i) social sustainability & equity, ii) economic sustainability, iii) environmental sustainability, iv) urban-

rural integration, v) food governance, and vi) reduce vulnerability & increase resilience. Given this extensivity and the focus on city regions, we considered it as a key reference.

However, the diversity of data to be collected seemed extremely demanding and more adequate to follow trends with the use of indicators of change: "change in/decrease/increase in" (See **Table**). The direct use of that tool was therefore dismissed.

Table A2: *Example of the construction of the CFRS sustainability area, impact area and indicators.*

Sustainability area: Social sustainability and equity
Overarching objectives: Improve health and well-being and increase access to food and nutrition
IMPACT Area: Accessibility: Degree of ease with which vulnerable/low-income groups in the city region can buy and prepare fresh nutritionally balanced food
1. [Change in] Number of food retail outlets located in or near to low-income neighborhoods that sell fresh fruit & vegetables
2. [Decrease in] Distance from household location to healthy food retail outlets for different income groups (or degree of access to healthy food outlets within 1 km also referred to as "food deserts")
3. [Change in] Number of public transport options/routes connecting low-income neighborhoods to food retail locations
4. [Reduction in] Number and % of households without access to adequate food storage and cooking facilities (for different income groups)
5. [Increase in] Number of households (urban and rural; both farmers and gardeners) growing a proportion of their own food needs
6. [Increase in] Percentage of household food self-reliance in food consumption by weight or economic value
7. [Change in] Food prices for different food products or commodities and for local versus non local foods)
8. [Change in] Proportional consumer expenditure by income group on key food items (fruit and veg, meat, dairy, grains, pulses)
9. [Decrease in] Cost of a healthy food basket in the nearby market - (this can also be compared with average income levels for specific groups)
10. [Change in] customer preference/willingness to pay for city region/local food products
11. [Change in] Number of hours of paid employment at the average wage required to support the minimum costs of a household healthy food basket
12. [Decrease in] Annual number and type of people supported by food assistance and aid programs
13. [Decrease in] Number and type of people requiring emergency food aid
14. [Change in] Proportion of population using social protection programs that address food access

Source: CRFS, 2017

Framework 2: Agri-Food Systems Sustainability Approach (AFSSA)

In Flanders, a research team designed a method in 2016 for measuring the sustainability of agri-food systems, called the **Agri-Food Systems Sustainability Approach (AFSSA)** (Hubeau et al., 2017). This method was used to conduct a baseline measurement of the sustainability of the Flemish agri-food system. The approach investigates the interaction between the agri-food system, the social system, and their integration within the ecosystem. A comprehensive description of seven forms of capital—natural, human, physical, financial, produced, social well-being, and cultural—was carried out to examine how efficiently these forms of capital are

currently performing. Subsequently, the obstacles to greater sustainability and opportunities were investigated.

This study had the aim to be a starting point and a platform for discussion for the transformation of the agri-food chain towards further sustainability, enabling the formulation of sustainability objectives that form the basis for strategic and operational plans. All the indicators were consolidated and studied, but their formulation and the use of the seven capitals proved to be difficult. This framework was not chosen for the present study.

Framework 3: Referential of sustainable food in Wallonia

Studies have been conducted in Wallonia as well. The ***Referential of sustainable food in Wallonia***[2], developed in a participatory way in 2017-2018 was used to develop a barometer of sustainability of the food system in Wallonia over 2023 and 2024. This barometer was developed by the Sytra team and ICEDD - a consulting office- in direct communication with the Direction du Développement Durable, part of the Walloon administration. The barometer took as a starting point a systemic approach to the food system composed of "motor and impacts", "agency", "activities", all influencing the food system (See Figure 5).

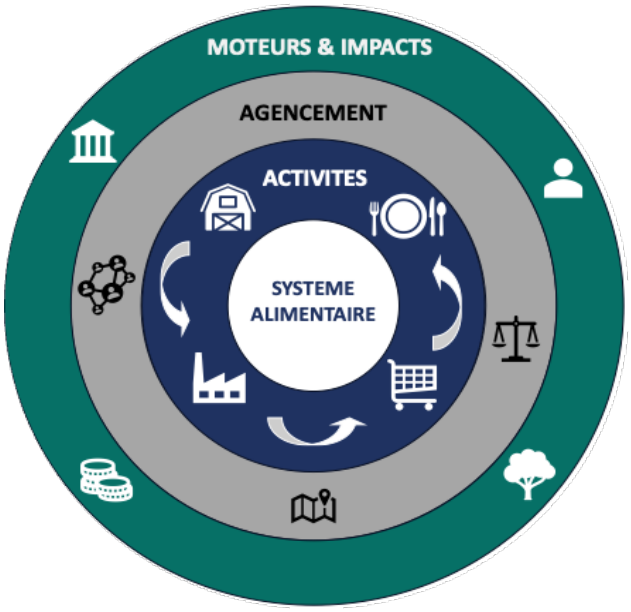


Figure 5: *Systemic approach to food system (Barometer of sustainable food in Wallonia)*

Framework 4: Sustainability Doughnut

We consequently identified the 'Brussels Donut' as a proper on-the-field tool and practice. This tool mobilizes the doughnut economic approach developed by Kate Rayworth. Because the doughnut approach reconciles a social and an environmental evaluation, and because it has been developed and used at the Brussels region's scale before, it seemed adequate and relevant to make use of it. In the Brussels Donut report, however, only five indicators were identified for the food sector as a component of the general system of Brussels (Table A3). Those indicators give a succinct overview of some food-related challenges and are therefore not considered sufficiently complete or relevant for the present study.

Table A3: *Indicators for food system sustainability in the general doughnut overview of Brussels*

Sector	Indicator
Food	Area of collective gardens per habitant
Food	Part of the above 6years old population that consume more water than the recommended volume
Food	Part of the above 6years old population that consume the daily recommended volume of fruits and vegetables
Food	Part of the adult population (18 years +) with obesity (BMI>=30)
Food	Part of the 2-17 years old with avec obesity

Source: Simplified Doughnut portrait, 2021

Framework 5: The Good Food Strategy 2

Moreover, the Brussels food system has already been analysed in preparation of the Brussels Good Food strategy (Bruxelles Environnement, 2021) and evaluated between the first and second strategy. In the strategy document, few data and qualitative information are shared as well as some targets and objectives, but no proper framework is mentioned or mobilized. After a round of research, it seems that the development of such a framework is ongoing at the BCR level as well.

Framework 6: Référentiel de durabilité

Another framework was developed in 2019, by the Cosyfood project, to evaluate alternative food networks in Brussels. Called "*Référentiel de durabilité*" (IGEAT, 2019), the evaluation is based on fourteen sustainability principles (equity, economic viability, territorial development, decent work, autonomy, heritage, animal welfare, environment and biodiversity, solidarity, transparency, health, awareness, energy, and circularity), under which 55 criteria and 105 indicators were designed. This extensive approach led us to choose another framework.

Framework 7: The Sustainability Compass

This tool is built on the doughnut concept developed by Kate Rayworth and is composed of seven environmental themes and eight socio-economic themes.

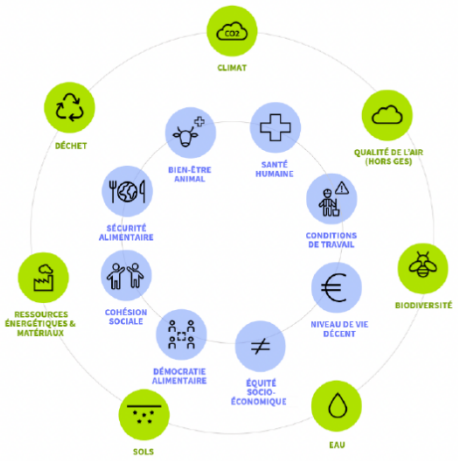


Figure 6: *Sustainability compass of the food system, developed by LeBasic (2021).*

Appendix B – Socio-economic indicators: data sources and definitions

Table B1: Overview of data sources and definitions used to document the socio-economic BRUFO2050 indicators.

Indicator	Data	Date	Timeframe (years)	Data source Brussels	Data link
S1.1 Prevalence of overweight and obesity	Overweight prevalence (BMI ≥ 25, Brussels population +18)	2023	22	Sciensano	https://www.sciensano.be/sites/default/files/ns_report_fr_his2023.pdf
S1.1 Prevalence of overweight and obesity	Overweight prevalence among young people (BMI ≥ 25, Brussels population 2-17)	2023	22	Sciensano	https://www.sciensano.be/sites/default/files/ns_report_fr_his2023.pdf (summary table p.32)
S1.1 Prevalence of overweight and obesity	Obesity prevalence (BMI ≥ 30, Brussels population +18)	2023	22	Sciensano	https://www.sciensano.be/sites/default/files/ns_report_fr_his2023.pdf (summary table p.32)
S1.1 Prevalence of overweight and obesity	Obesity prevalence among young people (BMI ≥ 30, Brussels population +18)	2023	22	Sciensano	https://www.sciensano.be/sites/default/files/ns_report_fr_his2023.pdf (summary table p.32)
S1.1 Prevalence of overweight and obesity	Average BMI in Brussels	2023	22	Sciensano	https://www.sciensano.be/sites/default/files/ns_report_fr_his2023.pdf (summary table p.32)
S1.2 Protein consumption from plant-based sources	Percentage of the population who identify as omnivores	2023	3	Sciensano	https://www.sciensano.be/sites/default/files/nh_report_fr_his2023.pdf (summary table p.57)
S1.2 Protein consumption from plant-based sources	Non-meat eaters (vegetarian or vegan) share in Brussels resident	2023	3	Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S1.2 Protein consumption from plant-based sources	Brussels residents eating legumes or plant-based protein alternatives at least once a week	2023	3	Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S1.2 Protein consumption from plant-based sources	Brussels residents reducing their meat consumed over the past 5 years	2023	3	Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S1.2 Protein consumption from plant-based sources	Main reasons for the decrease in meat consumption	2023		Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S1.3 Proportion of the population meeting dietary recommendations (by food group)	Percentage of the population (aged 6+) who consume the recommended 2 daily portions of fruits	2023	5	Sciensano	https://www.sciensano.be/sites/default/files/nh_report_fr_his2023.pdf (summary table p.57)
S1.3 Proportion of the population meeting dietary recommendations (by food group)	Percentage of the population (aged 6+) who consume the recommended 2 daily portions of vegetables	2023	5	Sciensano	https://www.sciensano.be/sites/default/files/nh_report_fr_his2023.pdf (summary table p.57)
S1.3 Proportion of the population meeting dietary recommendations (by food group)	Percentage of the population consuming fruit daily	2023	10	Sciensano	https://www.sciensano.be/sites/default/files/nh_report_fr_his2023.pdf (summary table p.57)

S1.3 Proportion of the population meeting dietary recommendations (by food group)	Percentage of the population consuming vegetables daily	2023	10	Sciensano	https://www.sciensano.be/sites/default/files/nh_report_fr_his2023.pdf (summary table p.57)
S1.3 Proportion of the population meeting dietary recommendations (by food group)	Brussels residents consuming meat or fish daily	2023	3	Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S1.3 Proportion of the population meeting dietary recommendations (by food group)	Brussels residents consuming meat or fish less than daily	2023	3	Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S2.1 Number of jobs in the Brussels agri-food sector	Number of companies engaged in food industry (per type of companies)	2023		Statbel	https://uclouvain.sharepoint.com/:w:/r/sites/O365G-SyTra/_layouts/15/Doc.aspx?sourcedoc=%7B52272B76-5724-4DBA-97DA-095FDFC51918%7D&file=Q1.5-%20Representative%20Actors%20Mapping.docx&action=default&mobileredirect=true
S2.1 Number of jobs in the Brussels agri-food sector	Number of companies in Brussels agri-food sector (production and processing)	2023	4	Hub.Brussels	https://hub.brussels/fr/le-secteur-alimentaire-a-bruxelles-toujours-solide-et-en-croissance/
S2.1 Number of jobs in the Brussels agri-food sector	Number of employees in Brussels agri-food sector	2023	4	Hub.Brussels	https://hub.brussels/fr/le-secteur-alimentaire-a-bruxelles-toujours-solide-et-en-croissance/
S2.2 Employment contract types in the agri-food and agricultural sectors in BCR	Employment contract types in the agri-food industry sector in BCR	2023 (average 2021 - 2023)		Actiris	https://panorama.actiris.brussels/fr/recherche/industrie-agro-alimentaire/conditions-de-travail#type-de-contrat
S2.2 Employment contract types in the agri-food and agricultural sectors in BCR	Employment contract types in the agricultural sector in BCR	2023 (average 2021 - 2023)		Actiris	https://panorama.actiris.brussels/fr/recherche/agriculture/conditions-de-travail#type-de-contrat
S2.2 Employment contract types in the agri-food and agricultural sectors in BCR	Employment contract types in all sectors in BCR (for comparison)	2023 (average 2021 - 2023)		Actiris	https://panorama.actiris.brussels/fr/recherche/industrie-agro-alimentaire/conditions-de-travail#type-de-contrat
S2.3 Employees with atypical working hours in agri-food sector in BCR	Employees with atypical working hours in agri-food sector in BCR	2023 (average 2021 - 2023)		Actiris	https://panorama.actiris.brussels/fr/recherche/industrie-agro-alimentaire/conditions-de-travail#horaires-particuliers-soir-nuit-week-end
S2.3Employees with atypical working hours in agri-food sector in BCR	Employees with atypical working hours in all sectors in BCR (for comparison)	2023 (average 2021 - 2023)		Actiris	https://panorama.actiris.brussels/fr/recherche/industrie-agro-alimentaire/conditions-de-travail#horaires-particuliers-soir-nuit-week-end
S3.1 Average income in agrifood industry in BCR	Average income in agrifood industry in BCR vs agrifood industry in Belgium - less 5 years experience	2022 (average 2020 - 2022)		Actiris	https://panorama.actiris.brussels/fr/recherche/industrie-agro-alimentaire/conditions-de-travail#salaires
S3.1 Average income in agrifood industry in BCR	Average income in agrifood industry in BCR vs agrifood industry in Belgium - more 10 years experience	2022 (average 2020 - 2022)		Actiris	https://panorama.actiris.brussels/fr/recherche/industrie-agro-alimentaire/conditions-de-travail#salaires
S3.2 Turnover of the food industry (excluding drink industry)	Turnover of the food industry (excluding drink industry) in million €	2022	5	Fevia/Statbel	https://hub.brussels/fr/le-secteur-alimentaire-a-bruxelles-toujours-solide-et-en-croissance/

S4.1 Poverty risk rate in Brussels	Share of Brussels residents at risk of poverty or social exclusion (AROPE EU20230)	2024	5	Statbel	https://statbel.fgov.be/en/themes/households/poverty-and-living-conditions/risk-poverty-or-social-exclusion#figures
S4.2 BIM beneficiaries	Number of BIM benificiaries in Brussels	2023	13	IBSA	https://ibsa.brussels/themes/precarite-et-aide-sociale/autres-formes-d-aide-sociale
S4.3 Income disparity in food spending	Food expenditure gap between highest vs lowest income quartiles (Q4/Q1)	2022		Statbel	https://statbel.fgov.be/en/themes/households/household-budget-survey-hbs#figures
S5.1 Public Engagement and Awareness on Sustainable Food System Issues	Consumer awareness on food waste, claim to pay special attention to food waste reduction (% of Brussels residents who already take at least one measure to combat food waste)	2023	3	Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S5.1 Public Engagement and Awareness on Sustainable Food System Issues	Share of residents adopting sustainable eating behavior, per type of behavior (systematically + frequently)	2023		Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S5.1 Public Engagement and Awareness on Sustainable Food System Issues	Main barriers to sustainable food	2020		Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S5.1 Public Engagement and Awareness on Sustainable Food System Issues	People awareness of food impact on climate: share of Brussels residents aware that food choices have an impact in the fight against climate change)	2023	3	Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S5.1 Public Engagement and Awareness on Sustainable Food System Issues	% of Brussels resident considering it is important that the food products they buy are locally sourced	2024		SPF Economie	https://economie.fgov.be/fr/publications/manger-local-et-alors-durable
S5.2 Equitable Access to Diverse and Sustainable Food Outlets	Availability of sustainable products in Brussels (Brussels residents having access to organic or sustainable food stores within a 10–15 minute walk from their home)	2023	3	Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S5.2 Equitable Access to Diverse and Sustainable Food Outlets	Availability of sustainable products in Brussels (Brussels residents having access to organic or sustainable food stores within a 10–15 minute walk from their home) by municipality	2023		Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S5.3 Policy Framework and Support for Socially Vulnerable Groups in the Food System	Legislation on unsold food donations	2024		Gondola.be	https://www.gondola.be/fr/news/les-supermarches-bruxellois-bientot-tenus-de-ceder-leurs-invendus-laide-alimentaire
S5.3 Policy Framework and Support for Socially Vulnerable Groups in the Food System	Number of policy instruments on food environment	2025		De Bauw et al.	https://www.sciensano.be/sites/default/files/sciensano-ku_leuven-food_environment_policies_in_belgium.pdf
S5.3 Policy Framework and Support for Socially Vulnerable Groups in the Food System	Number of policy strategies on food environment	2025		De Bauw et al.	https://www.sciensano.be/sites/default/files/sciensano-ku_leuven-food_environment_policies_in_belgium.pdf

S5.3 Policy Framework and Support for Socially Vulnerable Groups in the Food System	Key recommanded action on policy strategies on food environment	2025		De Bauw et al.	https://www.sciensano.be/sites/default/files/sciensano-ku_leuven-food_environment_policies_in_belgium.pdf
S6.1 Urban Food Production and Community Gardening	Share of population growing herbs	2023	3	Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S6.1 Urban Food Production and Community Gardening	Share of population growing vegetables and fruits	2023	3	Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S6.1 Urban Food Production and Community Gardening	Area of professional urban agriculture projects (ha)	2022	4	FEDEAU	https://www.fedeau.be/oeuvrer-pour-lau-professionnelle-analyse-des-impacts-et-besoins-de-lau-pro-a-bruxelles/
S6.1 Urban Food Production and Community Gardening	Estimated production volume in urban agriculture projects (T)	2022	4	FEDEAU	https://www.fedeau.be/oeuvrer-pour-lau-professionnelle-analyse-des-impacts-et-besoins-de-lau-pro-a-bruxelles/
S6.1 Urban Food Production and Community Gardening	Number of urban agriculture projects	2022	4	FEDEAU	https://www.fedeau.be/oeuvrer-pour-lau-professionnelle-analyse-des-impacts-et-besoins-de-lau-pro-a-bruxelles/
S6.1 Urban Food Production and Community Gardening	Number of collectives vegetable gardens in Brussels	2018	5	Leefmilieu Brussel	https://environnement.brussels/citoyen/outils-et-donnees/etat-des-lieux-de-lenvironnement/agriculture-urbaine-et-alimentation-durable
S6.1 Urban Food Production and Community Gardening	Area of collectives vegetable gardens in Brussels (ha)	2018	5	Leefmilieu Brussel	https://environnement.brussels/citoyen/outils-et-donnees/etat-des-lieux-de-lenvironnement/agriculture-urbaine-et-alimentation-durable
S6.2 Number of sales points in short supply chains (SSC)	Number of solidarity purchase groups (GASAP)	2021		GASAP	https://gasap.be/wp-content/uploads/2022/02/6_RAPAC_GASAP_2021_DEF.pdf
S6.2 Number of sales points in short supply chains (SSC)	Number of markets location in Brussel	2017	50	Atrium Brussels (Hub.Brussels)	https://hub.brussels/app/uploads/2019/07/pourquoi-comment-marches.pdf
S6.2 Number of sales points in short supply chains (SSC)	Number of weekly markets in Brussel	2017		Atrium Brussels (Hub.Brussels)	https://hub.brussels/app/uploads/2019/07/pourquoi-comment-marches.pdf
S6.2 Number of sales points in short supply chains (SSC)	Share of total fresh food purchases through various short supply chain channels combined in Wallonia + Brussels-Capital Region (cf. APAQ-W, 2023). - from the "Manger local, et alors...	2023		APAQ-W through Economie FGOV	https://economie.fgov.be/fr/publications/manger-local-et-alors-durable
S7.1 Affordability of Food and Food Price Inflation	Food price inflation for unprocessed food products (ICPH) - BELGIUM	2024	3	NBB	https://stat.nbb.be/Index.aspx?DataSetCode=HICP&lang=fr&utm
S7.1 Affordability of Food and Food Price Inflation	Grocery price comparison Brussels vs Flanders and Wallonia	2024		Numbeo	https://www.numbeo.com/cost-of-living/comparison.jsp
S7.2 Geographic Accessibility to Diverse Food Retailers and "Food Deserts"	Proximity of food retailers within walking distance (share of resident having access to each type of shop)	2023		Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf

S7.2 Geographic Accessibility to Diverse Food Retailers and "Food Deserts"	Geographic disparities in alternative food access (Share of residents per municipality having access to organic or sustainable food stores within a 10–15 minute walk from their home)	2023		Aqrate	https://goodfood.brussels/sites/default/files/inline-files/Sondage_GoodFood_Result_AQR-IBGE_2023.pdf
S7.3 Food Insecurity and Reliance on Food Aid	Proportion of adolescents and adults aged 10 years and older that indicate food insecurity: share Brussels residents who cannot afford a healthy diet	2024		Sciensano	https://www.sciensano.be/fr/resultats-de-lenquete-nationale-de-consommation-alimentaire-2022-2023/determinants-des-choix-alimentaires/securite-alimentaire
S7.3 Food Insecurity and Reliance on Food Aid	Proportion of adolescents and adults aged 10 years and older that indicate food insecurity: share Brussels residents who report that the food they bought did not last and they did not have money to buy more	2024		Sciensano	https://www.sciensano.be/fr/resultats-de-lenquete-nationale-de-consommation-alimentaire-2022-2023/determinants-des-choix-alimentaires/securite-alimentaire
S7.3 Food Insecurity and Reliance on Food Aid	Food aid dependence: number of people relying on food aid in Brussel	2024	8	Fédération des Services Sociaux asbl	https://www.fdss.be/fr/memorandum-2024-de-la-concertation-aide-alimentaire/
S7.4 Brussels' Food Self-Sufficiency Rate	Self-sufficiency rate (calculated for fruits, vegetables, potatoes, milk and dairy products)	2020		Riera et al.	https://sytra.be/wp-content/uploads/2020/10/approv_bxl_201103.pdf

Appendix C – Environmental indicators: data sources and definitions

Table C1: Overview of data sources and definitions used to document the environmental BRUFO2050 indicators.

Theme	Indicator	Data source
E1 Air pollution	E 1.1 Acidifying emission	Raw data from the inventory if GHG of BCR (1990-2022, submitted in 2024) https://environnement.brussels/citoyen/outils-et-donnees/etat-des-lieux-de-lenvironnement/emissions-de-gaz-effet-de-serre
E2 Biodiversity erosion	E2.1 Part of organic agriculture in total Surface UAA	Environnement.brussels https://environnement.brussels/citoyen/outils-et-donnees/etat-des-lieux-de-lenvironnement/agriculture-urbaine-et-alimentation-durable#good-food-agriculture-professionnelle-en-region-bruxelloise
E3 Climate disruption	E3.1 Greenhouse gas emissions by activity sector	Raw data from the inventory if GHG of BCR (1990-2022, submitted in 2024) https://environnement.brussels/citoyen/outils-et-donnees/etat-des-lieux-de-lenvironnement/emissions-de-gaz-effet-de-serre
	E3.2 Temperature rise for the region up to 2100	Environnement.brussels https://environnement.brussels/citoyen/outils-et-donnees/etat-des-lieux-de-lenvironnement/evolution-du-climat-vulnerabilites-et-adaptations
E4 Depletion of non-renewable resources	E4.1 Energy consumption by activity sector	Raw data from energy balance sheet (1990 to 2022 – submitted in 2024) https://environnement.brussels/citoyen/outils-et-donnees/etat-des-lieux-de-lenvironnement/consommation-denergie
	E4.2 Share of renewable energy in total energy consumption	
E5 Exceeding ecosystems' capacity	E5.1 Total volume, economic value and percentage of food lost & wasted along the food chain in the city region (trend)	https://environnement.brussels/citoyen/outils-et-donnees/etat-des-lieux-de-lenvironnement/production-des-dechets-totaux
	E5.2 Waste recovery at different levels of the food chain	https://etatdeslieux.environnement.brussels/fr/
E6 Water resources degradation	E6.1 Ecological state of surface waters and chemical state of underground waters	https://environnement.brussels/citoyen/outils-et-donnees/etat-des-lieux-de-lenvironnement/eaux-de-surface-qualite-biologie-et-emissions-de-polluants
	E6.2 Pesticide content in groundwater bodies	https://environnement.brussels/citoyen/outils-et-donnees/etat-des-lieux-de-lenvironnement/eaux-souterraines-qualite-quantite-et-modelisation
	Water use (number of withdrawals)	https://environnement.brussels/citoyen/outils-et-donnees/etat-des-lieux-de-lenvironnement/eaux-souterraines-qualite-quantite-et-modelisation