SEA for Sustainable Cities: How the Strategic Environmental Assessment Has Driven the ESI Programme Towards Urban Sustainability

Gaia Galassi, François Levarlet and Elodie Lorgeoux

Abstract Under Cohesion Policy, sustainable development is implemented at the territorial level through the five European Structural and Investment funds (ESIF). Among the uses for these funds, during the 2014–2020 period the European Regional Development Fund (ERDF) key priority areas include issues such as energy, transport, climate change adaptation and green infrastructure, all of which relate to sustainable cities. In this framework, the Strategic Environmental Assessment (SEA) procedure, carried out in the programming phase, is an important tool in driving ERDF Operational Programmes (OPs) towards sustainability. In this work, we examine 20 ERDF Italian program 2014–2020 and some related SEA Environmental reports to understand how much the theme of sustainable cities has been considered and how far SEA procedures have contributed to urban sustainability planning in local development strategies. Illustrations are given of sustainable approaches adopted in the OPs and SEA reports. Moreover, the analysis identifies recommendations to improve integration of the theme into the current and following programming periods.

Keywords Strategic environmental assessment · ESIF-ERDF programmes
Urban sustainable development approaches · SEA environmental reports

1 Introduction

The Italian urban system is highly heterogeneous. Cities are decentralized, spread across the country and have very diverse dimensions and features. The Corine Land Cover database shows that artificial surfaces are concentrated in lower, flatter areas, such as coasts and river courses (Appendix 2, Fig. 4). Accordingly, as seen in

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Appendix 2, Fig. 5, the majority of the population is near the coast and in the Po valley. This helps delineate 14 official metropolitan areas, with seven in the north and three in Sicily (see Appendix 2, Fig. 3). Indicators reveal significant socioeconomic differences. For example, the rate of employment highlights a strong north-to-south gradient, from above 60% in the north to less than 40% in the south (Appendix 2, Fig. 6). There is a higher percentage of foreign-born residents in metropolitan areas, as in the rest of Europe, with a peak in Rome (Appendix 2, Fig. 7). Public services, such as public transport, show significant differences. The indicator 'seat kilometers per capita at province level', for example, shows large differences between neighboring provinces. Expenditure on local public transport is proportional to the service provided (as showed in Appendix 2, Fig. 8).

Given the territorial and socioeconomic diversity over regions, urban systems require various paths to achieve urban sustainability. The ERDF Regulation (Reg. No 1301/2013) and the Italian Partnership agreement (EC decision, C (2014) 8021 final, 29.10.2014) give each region the opportunity to develop, through OPs, a strategy for urban sustainability in accordance with their specific needs.

According to Article 7(1) of the ERDF regulation, sustainable urban development should be promoted through strategies covering integrated actions to tackle economic, environmental, climate, demographic and social challenges affecting urban areas, while taking into account urban-rural links. Point 2 of the same article states that sustainable urban development can be promoted through Integrated Territorial Investments (ITIs) or through a Priority Axis.

According to the Guidance for Member States on Integrated Sustainable Urban Development, key elements must be developed in the programming phase related to:

- **The selection of urban areas through specific procedures** based on a preliminary analysis of local needs;
- **A delegation** to urban authorities designated as intermediate bodies helping design and implement sustainable urban development on behalf of the managing authority and 'shall be responsible for tasks relating, at least, to the selection of operations' (Article 7 of the ERDF regulation);
- **The identification of a method of implementation**: the various methods for implementing sustainable urban development include defining ITIs in specific OPs or using ad hoc instruments;
- **Using integrated sustainable urban strategies** as planning approaches.

The Italian Partnership Agreement identifies three potential drivers for sustainable urban development:

- Restyling and modernizing urban service, including actions for sustainable mobility, energy saving and renewable energy, and reinforcement of existing services and their development;
- Actions for social inclusion that aim to sustain the existing social policies targeting vulnerable groups of people and run-down districts;

- Enhancing urban capacity by boosting local components of global production chains.

The Partnership Agreement selected four Thematic Objectives (TOs) in accordance with these drivers:

- TO2 'Enhancing access to, and use and quality of, information and communication TO2 technologies', enhancing digital services for citizens, digital inclusion and on-line participation;
- TO4 'Supporting the shift towards a low-carbon economy', for sustainable energy and quality of life, including sustainable mobility;
- TO3 'Enhancing the competitiveness of SMEs', enforcement of economic activities with social contents and new enterprises linked to the urban context;
- TO9 'Promoting social inclusion, combating poverty and any discrimination', concerning social inclusion, reduction of housing deprivation, and enhancement of legality.

In addition, the Partnership Agreement identifies two additional TOs that promote urban sustainability:

- TO5 'Promoting climate change adaptation, risk prevention and management', for flooding and coastal erosion, and fire and seismic risks;
- TO6 'Preserving and protecting the environment and promoting resource efficiency', concerning waste management, water management, improvement of cultural and natural heritage, as well as enhanced competitiveness for tourism.

In this context, the SEA is an important tool, including urban sustainability concerns in OPs co-financed with ESI funds.

The SEA procedure, defined by Directive 2001/42/EC, went hand-in-hand with drafting the program as described in ERDF regulation (see Appendix 1, Fig. 1).

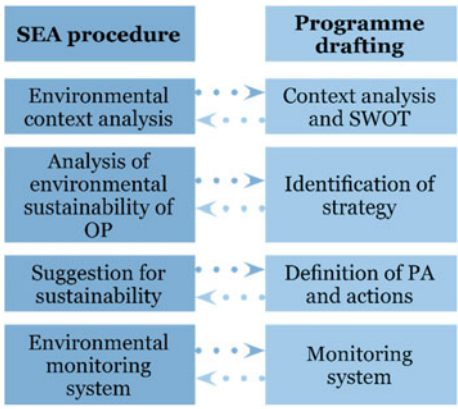

Fig. 1 Relationship between the SEA procedure (according to Directive 42/2001/EC) and programme drafting (ERDF regulation)

This scrutinizes program documentation, assessing environmental effects from program implementation, as well as consistency of the program with the strategic environmental context. The SEA helps drive the program toward sustainability, during both programming and implementation, through environmental monitoring.

Past studies have analyzed the contribution of SEA to urban sustainability, but they mainly focused on urban planning (see, e.g., Shepherd and Ortolano 1996; He et al. 2011) or on infrastructure sustainability (Arce and Gullón 2000). In this work, for the first time, we propose analyzing if and to what extent urban sustainability has been included, through SEA, in (ESIF) programming instruments, which differs from the standard urban planning. In this paper, we examine 20 ERDF Italian programs during 2014–2020 and three related SEA environmental reports to understand how much sustainable cities were considered and the contribution of SEA procedures to promoting urban sustainability planning in local-development strategies.

2 Data and Methods

The approach used in this study focuses on two activities (i.e., program reviewing through a desktop analysis):

- Analysis of Italian OPs;
- Analysis of SEA environmental reports.

The **analysis of OPs** aims to understand if and how sustainable cities are considered in the program strategy. The analysis followed three steps.

Step 1. Identification of strategic elements. Each OP is analyzed to find out if a strategic approach was used to implement urban sustainability. In particular, OPs were scrutinized to find one or more of the following:

– a priority axis explicitly devoted to urban sustainability;
– an integrated strategy for sustainable urban development;
– any ITI for urban sustainability.

Step 2. Identification of TOs for urban sustainability. Note that TOs that are consistent with (and can contribute to) urban sustainability, but do not explicitly refer to at least one of the three strategic elements (priority axis, integrated strategy or ITI), are not considered in the analysis.

Step 3. Identification of financial resources. The financial resources allocated to urban sustainability in each OP are calculated, per TO, considering:

– any resources allocated to the priority axis related to urban sustainability;
– definition at TO level based on the 'intervention field dimension' (Reg. EU 184/2014, Annex I, Table 1);
– any resources allocated to the integrated strategy. Note that the definition of financial resources is given for each priority axis within the description of the

'financial form' asterritorial delivery mechanism dimension', according to Regulation EU 184/2014, Annex I, Table 4); and finally;
– the allocation to ITI (here the definition for each TO is usually made explicit in the OP itself).

In addition to the previous steps, a specific analysis identified potential selection criteria linked to urban sustainability in the programs.

The **SEA contribution to the program** is analysed based on the Environmental Reports. We selected three OPs as case studies. The selection was based on geographical location (north-center-south), the amount of resource allocated, the presence of metropolitan areas/cities and the main issues concerning urban systems. The three cases represent various situations in Italy.

Each case study considered the following questions:

- **Was urban sustainability considered in drafting the OP?** Checking if and how urban sustainability was considered during preparation of the OP, including results from the consultation process and, in the section related to context analysis, analyzing the concept of 'urban sustainability' used.
- **Is the urban sustainability approach consistent with other urban sustainability strategies in the program area**? The external coherence in the environmental report verifies if the principles and objectives of the OP are consistent with plans, programs and strategies at national, European and international levels.
- **Has the SEA procedure actively contributed to increased urban sustainability in the OP?** Analyzing the extent to which SEA conclusions produced concrete recommendations on urban sustainability, especially for the selection of operations and the use of indicators or other monitoring measures.

3 Results

3.1 Analysis of the Operational Programmes

3.1.1 Strategies for Urban Sustainability (SUS)

Analysis of Italian ERDF OPs highlights very different strategies to implement urban sustainability between regions (see Appendix 1, Table 1). Specific priority axes are included in some 43%, or nine of 21 OPs, whereas integrated strategies for urban sustainability are in 66% of OPs (14 of 21). ITIs are activated in only a small fraction and only when an integrated strategy is not included. When both a priority axis and an integrated strategy for urban sustainability are defined in the OP, the integrated strategy is mainly (or exclusively) based on actions included in the priority axis.

Table 1 Urban sustainability strategies in Italian OPs for programming period 2014–2020 (see Sect. 2 for the method)

ERDF Operational Programme (OP) 2014–2020	Integrated strategy	PA devoted to Urban sustainability	ITI (integrated territorial investment)	Share of resources (%)
Abruzzo	X	X		10
Basilicata			X	4
Calabria	X		X	9
Campania	X	X		5
Emilia Romagna		X		6
Friuli Venezia Giulia	X	X		3
Lazio				0
Liguria	X	X		5
Lombardia	X			12
Marche	X			2
Molise	X		X	12
Piemonte	X	X		3
Apulia	X	X		3
Sardegna	X		X	3
Sicilia	X		X	7
Toscana	X	X		3
Umbria	X	X		5
Valle d'Aosta				0
Veneto	X	X		6
Trento				0
Bolzano				0

The right-hand column shows the share of OP resources allocated for integrated strategy and/or relevant priority axis

Some OPs have both integrated strategies and priority axes for urban sustainability. In these cases, integrated strategies are completely, or even exclusively, based on a priority axis (e.g., for Abruzzo and Liguria). Few integrated strategies include expenditures under an axis other than the priority axis directly dedicated to urban sustainability (e.g., Apulia, Campania). OPs that do not include any axis for urban sustainability base their integrated strategies mainly on a priority axis for sustainable mobility, energy saving and environmental protection. Four OPs chose not activate any specific measure for urban sustainability. For three of them (namely, Valle D'Aosta Region, and the Independent Provinces of Bolzano and Trento), this is because the characteristics and the socioeconomic conditions of the territory mean the 'urban system' is not a developmental priority. The fourth case is the Lazio region that hosts the most important city in Italy, Rome.

3.1.2 Thematic Objectives and Financial Resources

As shown in Appendix 1, Fig. 2, the amount of resources for urban sustainability, computed as described in Sect. 2, differs significantly from OP to OP, from 0 (Lazio

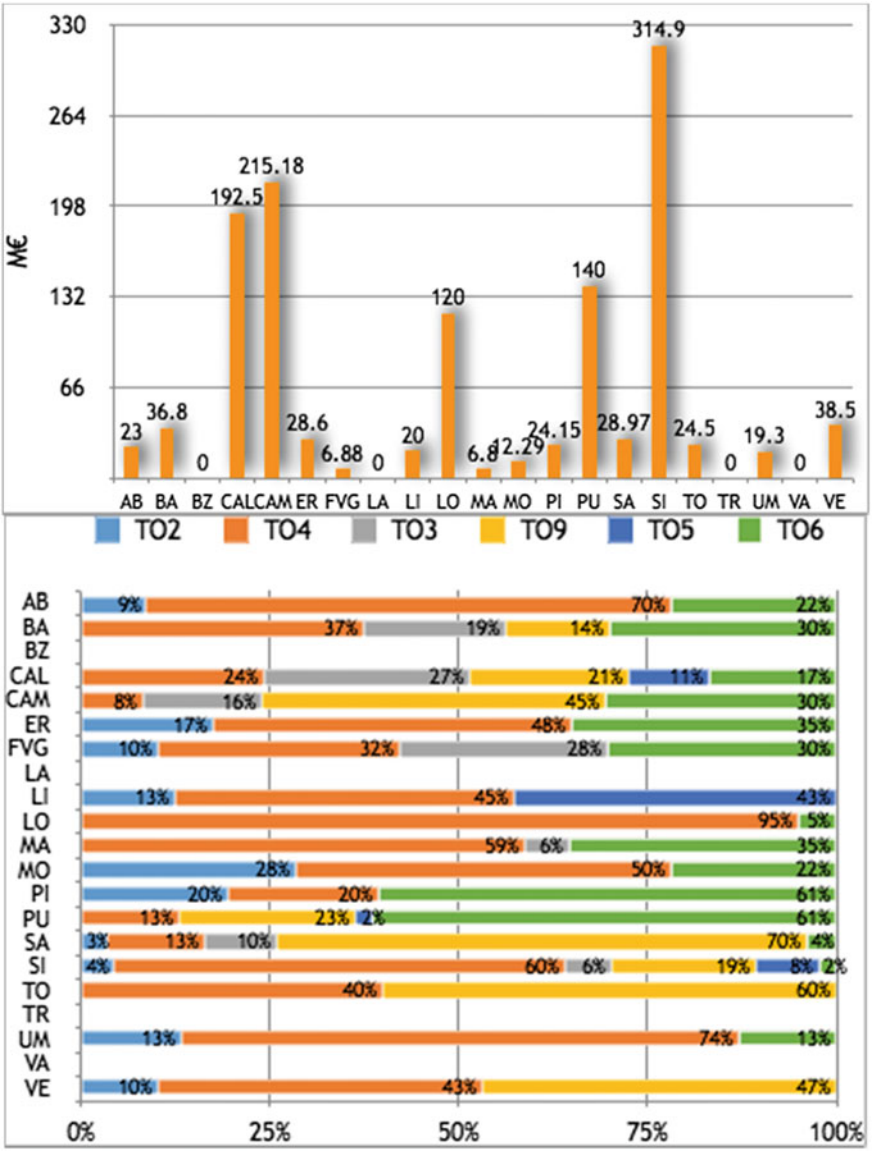

Fig. 2 Absolute amount of resources (in millions of euros) for Italian OPs in the programming period 2014–2020 (upper frame) and the share of resource budget for each TO as reported in the approved OPs (bottom frame)

and Valle d'Aosta) to more than €300 million (Sicilia). This depends both on the strategy (as described in the previous section, four administrations did not activate any specific strategy on urban sustainability), as well as on the resources allocated to each OP. According to the needs and the socioeconomic situation of the territory, resources range significantly from less than €100 million (Valle d'Aosta) to more than €4000 million (Campania, Sicilia, Apulia). The total amount of the program does not reflect the share dedicated to urban sustainability. Regions with the highest share are Lombardia, Molise and Abruzzo (see Appendix 1, Table 1), whose OPs are in the midrange of the total financial resources ranking.

Some TOs are implemented more than others (see Appendix 2, Fig. 2): TO4 (mobility and energy) is included in 17 of the 21 OPs; TO5 and TO3 are the less implemented (in four and seven OPs, respectively); TO6 (that was 'additional' in the partnership agreement) is activated for urban sustainability in 13 OPs, with actions mainly focused on tourism. TO4 attracted about 40% of the resources allocated to each TO, followed by TO9 (23%) and TO6 (19%).

3.2 Urban Sustainability and SEA: Three Case Studies

Three case studies, Apulia, Veneto and Campania, reflect very different situations.

The OP ERDF of Apulia Region has about €5.5 billion and is organized into 13 priority axes (including Technical Assistance), one of which is devoted to urban sustainability (Priority Axis 12). Total resources allocated for Priority Axis 12 are €65 million. This priority includes TO4 (Reduction in energy consumption and improvement of sustainable urban mobility in urban areas), TO5 (Reduction in hydrogeological risk and coastal erosion), TO6 (Maintenance and improvement of water quality and improvement of offer and fruition of cultural heritage) and TO9 (Reduction of families with social and economic fragilities and increase legality).

An integrated strategy for sustainable urban development is also included. This integrated strategy requires urban authorities to complete a Programme Document of Urban Regeneration including an overall strategy of sustainable development for urban areas (based on urban requalification, social inclusion, environmental sustainability). Total resources for the integrated strategy are €140 million (€65 million from Priority Axis 12 and €75 million from Priority Axis VI on environmental protection). ITI are not activated.

The OP ERDF of the Campania Region is organized with ten priority axes plus Technical Assistance, and financial resources of €4.1 billion. Priority Axis 10 focuses on urban development and includes TO3 (Promoting competitiveness of SMEs), TO4 (Reduction in energy consumption), TO6 (Improvement of cultural heritage and tourist destinations) and TO9 (three socio-educational services and Specific Objective 9.6, legality in urban areas). The resources for Priority Axis 10 are about €215 million.

The OP also includes an integrated strategy for urban development for 19 cities. In the 2007–2013 programming period, there were Urban Integrated Programmes (which needed updating). The integrated strategy is mainly based on Priority Axis 10, but further resources are allocated to an 'integrated mechanism for sustainable urban development' under different priority axes. These total €115 million (€21 million for TO3 in Priority Axis 3, €9.7 million for TO4 in Priority Axis 4, €38.3 million for TO6 in PA6 and €46.6 million for TO9 in PA8). ITI are not activated.

The OP ERDF of the Veneto Region has resources of about €600 million. The OP is organized in seven priority axes (including Technical Assistance), Priority Axis 6 is devoted to urban sustainability and includes: TO2 (Digitalization of administrative processes and diffusion of digital services); TO4 (Increased sustainable urban mobility); and TO9 (Reduction of families at risk, related to economic and housing conditions). The total resources for Priority Axis 6 is €38.5 million. An integrated strategy for sustainable urban development is based on Priority Axis 6 and preselects two types of areas: 'functional urban areas' and metropolitan cities (Venezia, Vicenza, Padova, Treviso, Verona and hinterland municipalities), as well as minor cities with relevant urban functions (Mirano, Montebelluna, Castelfranco Veneto, Camposampiero, Cittadella, Monselice, Este, Isola della Scala, Legnago, Schio, Thiene, Bassano del Grappa). Calls for integrated strategies will include environmental sustainability conditions. ITI are not activated.

3.2.1 Inclusion of Urban Sustainability in OP Drafting

For the Apulia and Campania OPs, the program was drafted in collaboration with economic, social and institutional stakeholders. In Apulia, five roundtable discussions activated partner consultation, one of which covered urban and territorial development. In Campania, even though both the municipality network and the regional office for urban policy participated in preliminary consultations, discussions do not seem to have focused on urban sustainability. In Veneto, while drafting the OP, no specific attention was given to urban sustainability. Nevertheless, authorities responsible for urban policies were involved in the consultation from the beginning of the OP drafting, as were urban authorities.

Only Campania described the 'urban environment' as an actual environmental issue. Cities are not only considered as a source of pressure on the natural environment, but also as a system whose sustainability could be improved through the OP. The context analysis included a section devoted to the urban environment, describing building stock, poor housing, illegal building, demography, commuting, noise, air and electromagnetic pollution, urban greenery and urban planning. In addition, potential problems were taken into account in the description of other environmental issues, including the conservation of urban parks in the description of nature and biodiversity, or risks to the urban population in the discussion of natural and technological risks. For Apulia and Veneto, the context analysis does

not include a separate section on urban sustainability. In the Apulia OP, the urban dimension was analyzed under various environmental issues, such as:

- Adaptation to climate change: the interaction between climate and the human system analysis also considered the urban dimension (especially urbanization);
- Air quality: there are air-quality indicators for urban settlements;
- Water quality: water treatment is also presented in relation to the main urban settlements;
- Soil and natural risk: urbanization is considered a threat;
- Natural system and ecological quality: urbanization is considered a threat;
- Quality of coastal water: waste water from urban settlements are considered a pressure.

For the Veneto OP, the preamble to the context analysis describes the territory of the Veneto Region, with a broad review of the structure and functionality of urban, peri-urban and non-urban areas. Cities and urban environment are taken into account in the 'air quality' description (as places where air pollution is a critical issue) and in the 'waste' section (related to the production of urban waste). Urbanization is discussed in relation to hydrogeological risks and to landscape and ecosystem conservation.

3.2.2 Coherence and Synergies Between the OPs and Other Urban Sustainability Strategies

An external coherence analysis in the Apulia Environmental Review highlights high coherence between Priority Axis 12, the 'Landscape territorial urban plan' and the 'Landscape Plan', as well as good coherence with existing Plans for Natura 2000 Network. In these cases, the coherence is probably linked with actions on 'ecological requalification of productive areas' (Investment Priorities 6c and 6e). Specific action on water quality and risk management are in line with 'Regional plan for aqueducts', 'Regional plan for water quality' (and in turn with 'Regional plan for coastal system'), as well as with other regional and district plans on hydrogeological management.

The coherence with 'Regional plan for Air quality' and 'Regional energy plan' is linked to action under TO4 (Investment Priorities 4c and 4e) related to sustainable urban mobility and energy consumption. Coherence between Priority Axis 12 on urban sustainability and the regional programs, assessed in the environmental review, is not completely clear. For example, coherence between Priority Axis 12 and the Regional Strategy for Transport 2009–2013 has not been considered.

For Campania, the environmental review assesses direct coherence between Priority Axis 10 and the regional territorial plan for improving services and quality in urban systems ('Smart Cities'). There is indirect coherence with the regional plan for air quality, concerning the reduction in emissions from supporting sustainable

mobility actions. The contribution description for Priority Axis 10 points out coherence with other regional plans for the improvement of the urban environment.

The Veneto Environmental Review shows coherence between Priority Axis 6 and the main regional plans. Coherence with the Regional Development Programme is linked to implementation of sustainable mobility and sustainable energy (TO4), to an improvement of sustainability of urban settlements and social inclusion (TO9), to the improvement of accessibility (TO2) and to enhancing the economy and SMEs (TO3). Similarly, actions for the restoration and valorization of existing public buildings inside the social inclusion strategy enhance coherence between Priority Axis 6 and the Regional Landscape Plan. Implementation for TO4 under Priority Axis 6 is also coherent with the 'Regional Air Quality Plan' (for actions on sustainable mobility) and with the 'Regional Energy Plan' (for interventions on energy saving and renewables). The only 'non-coherence' for Priority Axis 6 is with the 'Regional Waste Plan' and is connected with the possible increase in specific waste from industries following investment in SMEs.

The Campania OP has numerous synergies with other programs and strategies. The 'National Operational Programme for metropolitan cities' ('PON Città Metropolitane') 2014–2020 aims to coordinate the effort at national level between 18 cities, including Naples, to improve access to ICT (TO 2), to sustain the transition toward a low-carbon economy (TO4) and to promote social inclusion (TO2).

The Campania Region OP has direct coherence with 'PON Città' since Priority Axis 10 and its integrated strategy implement the TO mentioned in the National Programme.

Priority Axis 6 and the Integrated Strategy for Urban Sustainability of OP **Veneto** are in line with Strategy Europe 2020. Synergy with other ESI funds is ensured for all TOs covering urban sustainability. In particular, projects implemented in Interreg Europe, MED, Alpine Space, Central Europe and Italy-Slovenia can promote changes in knowledge and competence regarding energy efficiency in public buildings and sustainable mobility (TO4), also promoting new solutions and strategies for energy planning. The implementation of integrated strategy for urban sustainability in the city of Venice is synergetic with 'PON Città'.

For Apulia, synergies are described with macroregional strategies such as the EUSAIR Strategy.

3.2.3 Recommendation and Monitoring System in SEA

In the three case studies, the environmental reviews do not contain specific recommendations for urban sustainability. For Apulia, some of the suggestions covering other specific issues relate to cities and can improve the urban environment. These include the priority to complete, update and optimize drainage and cleaning systems in urban settlements with highly seasonal tourism; the priority for ecological networks in urban areas; as well as the priority for urban requalification in historic centers, suburbs and coastal settlements.

The Campania OP requires the Environmental Authority to maximise sustainability during OP implementation. Nevertheless, the environmental review recommended including environmental objectives into implementation tools, as is done with the integrated project for urban areas.

Monitoring systems proposed in the SEA Environmental Reports did not devote specific sections to urban sustainability. The environmental monitoring system of Apulia OP includes indicators that can monitor the change in pressure on (and from) urban systems. These refer to water quality (water treatment in terms of inhabitant coverage and compliance of water treatment systems with regulations), soil use (including soil consumption for new urbanization) and green urban areas.

The Campania Environmental Report does not include in-depth indicators for an environmental monitoring system, but refers to the 'PUMA' (Unique Plan for Environmental Monitoring) that will be implemented for all Campania OPs and co-financed with ESI funds. Nevertheless, the environmental review includes a list of context indicators, some of which are suitable for monitoring the implementation of urban sustainability. These include nature and biodiversity: density of historic parks in urban centers; landscape and cultural heritage; density of urban greenery in major cities; landscape and cultural heritage; and availability of urban greenery in major cities.

Similarly, the monitoring system proposed in the Veneto SEA Environmental Report does not contain specific indicators for urban sustainability, but includes some indicators useful to monitor the change in pressure on (and by) urban systems. In particular, the indicators referred to air quality and energy consumption (emission of CO_2 from traffic, PM10 concentration, etc.) and help for monitoring the efficacy of actions under TO4.

4 Discussion and Conclusion

Analysis of the OPs has shown how urban sustainability is relevant for all Italian regions. Nevertheless, with the exception of Regions with problems related to legality, social inclusion and public housing, urban sustainability is usually considered in terms of pressure generated by urban systems on the environment. This confirms studies (see, e.g., Wu 2010; While et al. 2004) that point out how urbanization—defined as the spatial expansion of the built-up environment, densely packed people and their socioeconomic activities—has often been held responsible for most environmental problems. As discussed in Wu (2008), urbanization should not be viewed merely as a cause for environmental problems, but also as an inevitable path to regional and global sustainability, enabling people to experiment with new solutions and technologies. For this, policies should actively take into account urban sustainability, involving people and stakeholders at various governance levels.

As Haughton (1999) pointed out, there are various categories of approaches to sustainable urban development, including market-based and social approaches. For EC cohesion funds, sustainable urban-development issues are addressed through the choice of specific priority axes and program objectives, as well as through specific financial allocations for dedicated actions.

In our analysis, social issues (TO9) are included in urban sustainability strategies only for a fraction of the OPs reviewed (eight out of 20) and only a few devoted to these considerable resources (see Fig. 2). Even less is devoted to competitiveness of enterprises (TO3) and to ICT (TO2). This, together with the greater resources for environmental TOs (4, 5 and 6, on low carbon, natural risks and environmental protection, respectively), confirm the tendency of Italian OPs to consider urban sustainability only in relationship to environmental pressure.

Strategic environmental assessments should be the tools through which environmental issues and the other elements for sustainability in urban system are integrated. Even if our study analyzed only three environmental reports, analysis of all the Italian OPs has led to some conclusions.

SEA conclusions and recommendations should be included more systematically in OP documents. Our analysis has shown that OPs have not always included SEA outputs, for example, in relation to more systematic involvement of stakeholders. Furthermore, it is worth noting that only a few OPs included selection criteria or other urban sustainability implementation tools.

4.1 How Was Urban Sustainability Considered in Drafting the OP?

SEA has helped programming authorities include urban sustainability issues, by involving stakeholders in urban aspects during OP preparation (Apulia), as well by including urban concerns in the context and the SWOT analysis (Campania). Nevertheless, the urban environment is often considered merely as a pressure on 'classical' environmental compartments (air quality, soil, water, etc.), instead of being considered as a separate issue with specific features, needs and developmental opportunities.

4.2 Coherence and Synergies Between OPs and Other Urban Sustainability Strategies

In the three case studies, the OPs are coherent with other plans, programs or strategies concerning urban sustainability in the region. In some cases, synergies with other strategies are actively pursued, as with the Veneto OP and in Campania with the 'PON Città' (the National Operational Programme on Cities).

4.3 Potential Contribution of SEAs to Urban Sustainability in OP Implementation

SEAs can help include urban sustainability in OPs through recommendations and environmental monitoring systems. In the three case studies, none included explicit recommendations for urban sustainability. Nevertheless, some recommendations for specific environmental issues affect urban areas as well, such as a priority for ecological networks to be implemented in urban areas, or the drainage and cleaning infrastructure in tourism cities suggested by the Apulia Environmental Report.

The Campania Environmental Review indicates that the Environmental Authority will be involved in the whole OP implementation to maximize overall sustainability. In the three cases, environmental monitoring systems will be refined during the program set-up phase. Nevertheless, the Apulia and Veneto Environmental Reviews included environmental indicators suitable for monitoring the expected effects of actions for urban sustainability.

Most OPs do not include specific criteria for selecting operations linked to urban sustainability. Nevertheless, in most cases this is because operation selection is detailed by the Monitoring Committee during program implementation in the OP drafting phase.

Appendix 1

See Figs. 1, 2 and Table 1.

Appendix 2

See Figs. 3, 4, 5, 6, 7 and 8.

Fig. 3 Financial allocation for urban sustainability in Italian ERDF Operational Programmes 2014–2010 (see Sect. 2 for the method)

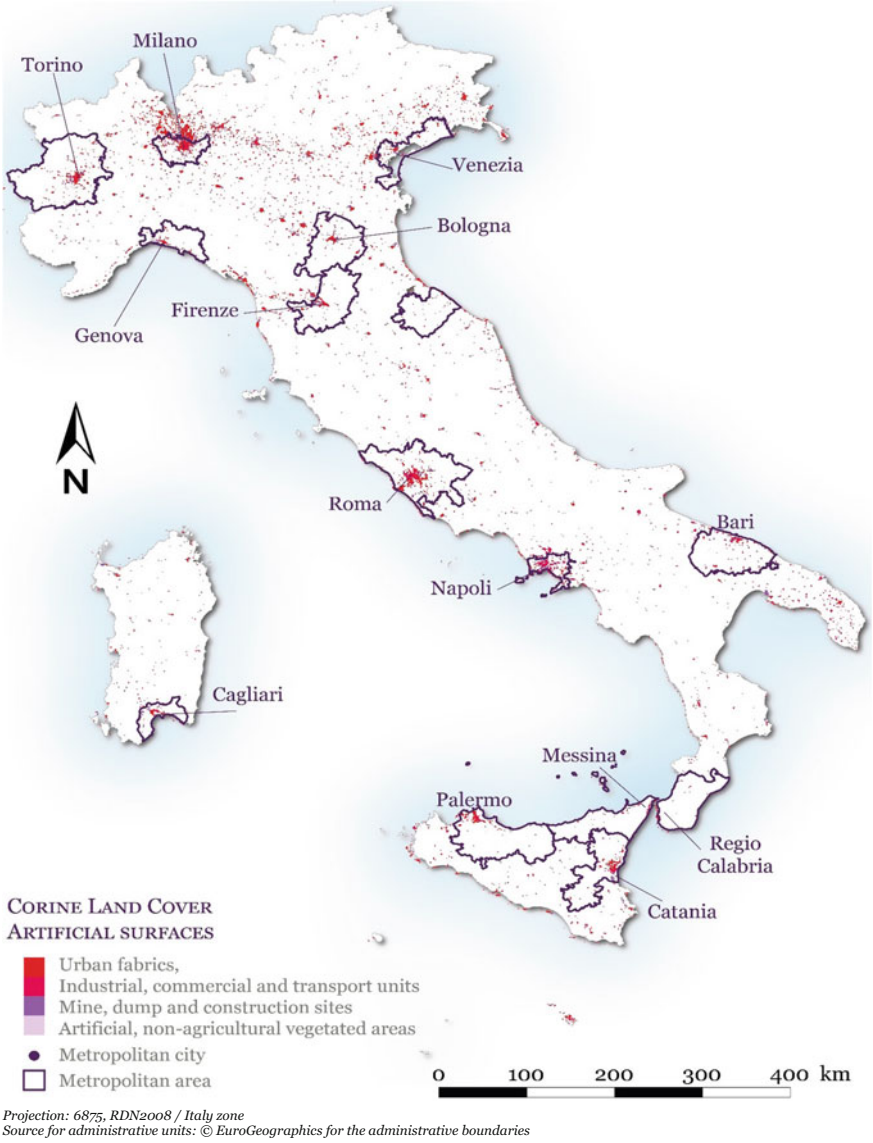

Fig. 4 Artificial surface according to the Corine Land Cover database (http://www.eea.europa.eu/data-and-maps/data/). The area pertain to CLC class 1—artificial surface. Metropolitan areas and metropolitan cities are also shown (the area of metropolitan cities is delineated by the province area)

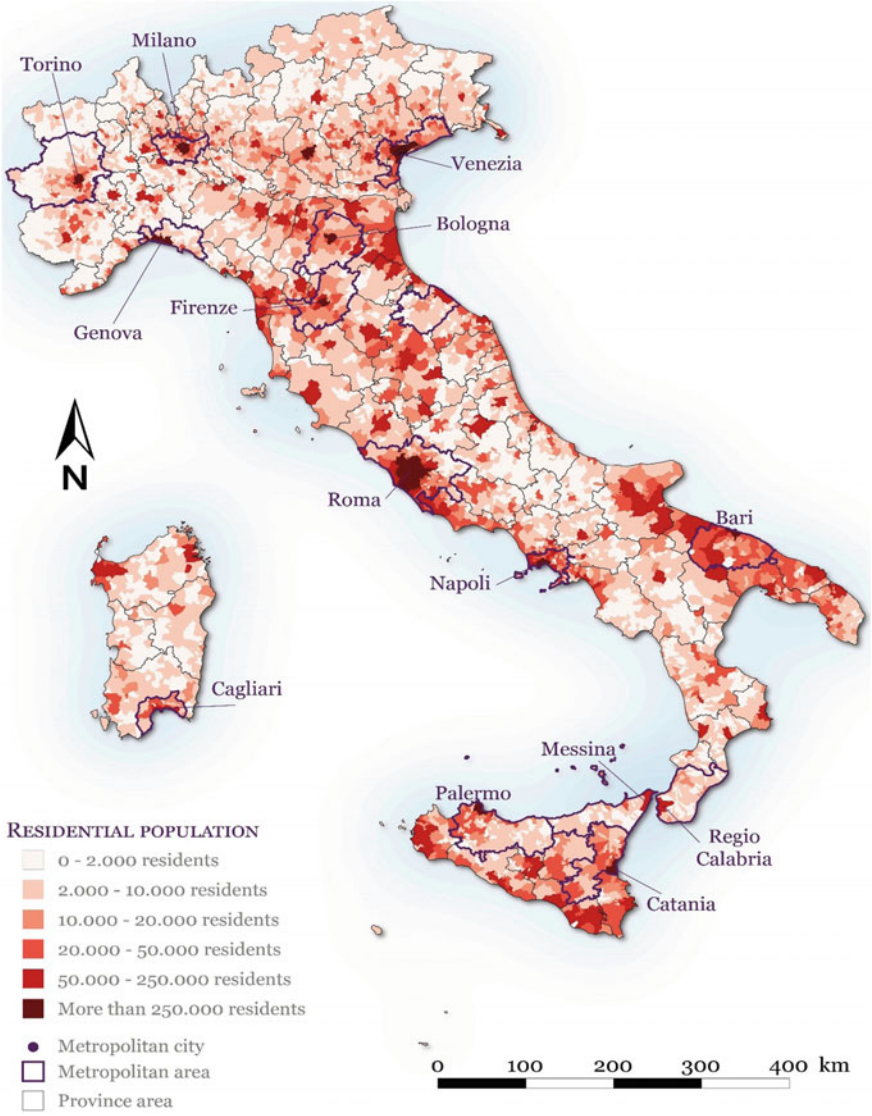

Fig. 5 Inhabitants at municipality level. *Source* Elaboration on ISTAT (National Institute of Statistic) data for the year 2016

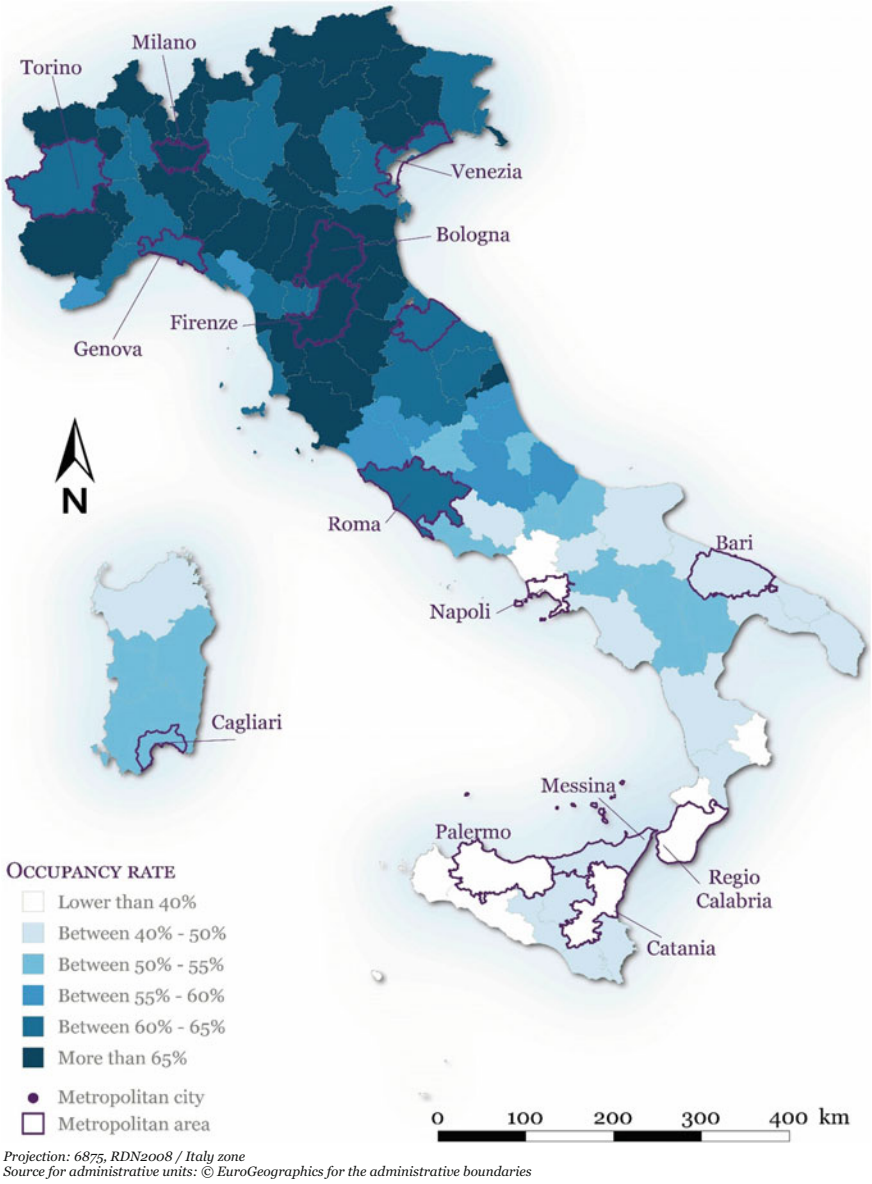

Fig. 6 Occupancy rate per province. *Source* Elaboration on ISTAT (National Institute of Statistic) data for the year 2016

Fig. 7 Foreign residents per municipality. *Source* Elaboration on ISTAT (National Institute of Statistic) data for the year 2016

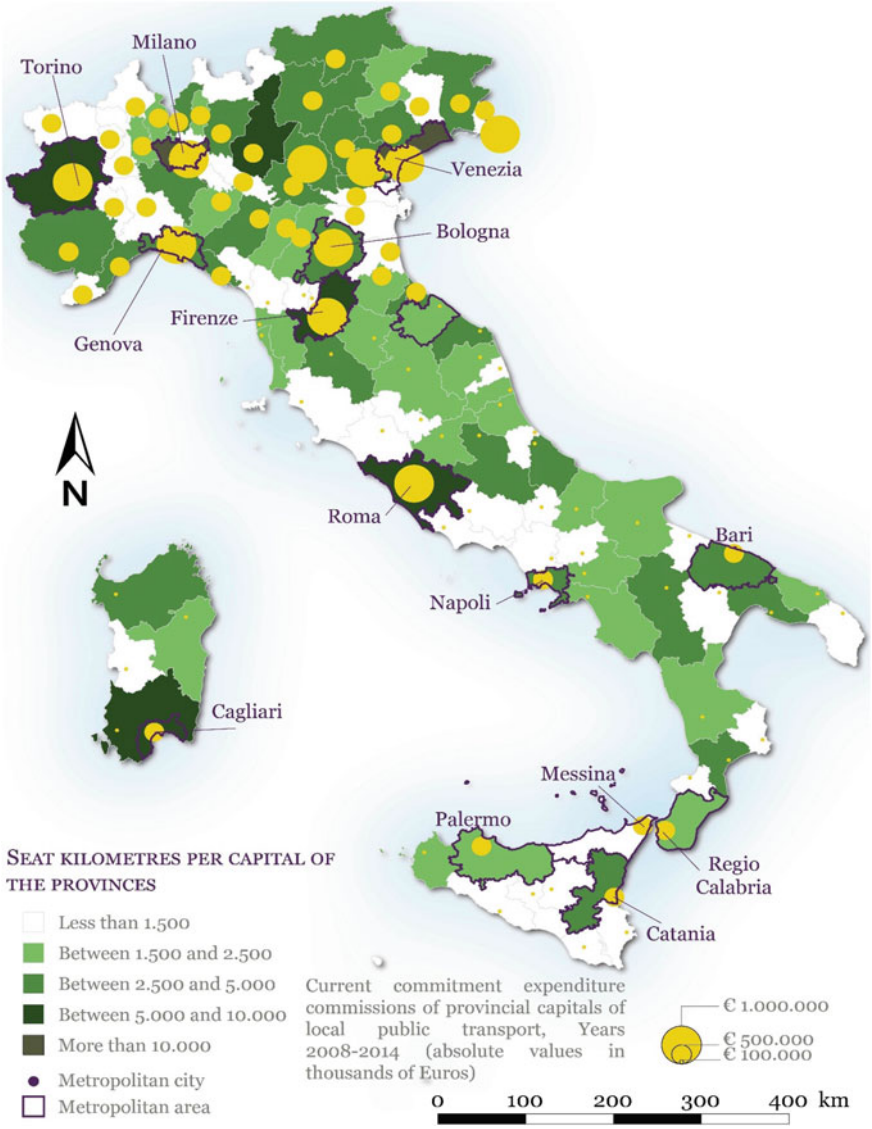

Fig. 8 Seat kilometers per capita and expenditure for local public transport at province level. *Source* Elaboration on ISTAT (National Institute of Statistic) data for the year 2014

References

Arce, R., & Gullón, N. (2000). The application of strategic environmental assessment to sustainability assessment of infrastructure development. *Environmental Impact Assessment Review, 20*(3), 393–402.

European Commission. (2014). Accordo di partenariato—CCI2014IT16M8PA001. Decision C (2014) 8021 final.

European Environment Agency. (2006). Corinne land Cover database.

European Union. (2013). Regulation No 1301/2013 of the European Parliament and of the Council of 17 December 2013, on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006.

European Union. (2014). Commission Implementing Regulation (EU) No 184/2014.

Haughton, G. (1999). Environmental justice and the sustainable city. *Journal of Planning Education and Research, 18*(3), 233–243.

He, J., Bao, C. K., Shu, T. F., Yun, X. X., Jiang, D., & Brown, L. (2011). Framework for integration of urban planning, strategic environmental assessment and ecological planning for urban sustainability within the context of China. *Environmental Impact Assessment Review, 31*(6), 549–560.

Shepherd, A., & Ortolano, L. (1996). Strategic environmental assessment for sustainable urban development. *Environmental Impact Assessment Review, 16*(4), 321–335.

While, A., Jonas, A. E. G., & Gibbs, D. (2004). The environment and the entrepreneurial city: Searching for the urban 'sustainability; fix' in Manchester and Leeds. *International Journal of Urban and Regional Research, 28*(3), 549–569.

Wu, J. J. (2008). Making the case for landscape ecology an effective approach to urban sustainability. *Landscape Journal, 27*(1), 41–50.

Wu, J. J. (2010). Urban sustainability: An inevitable goal of landscape research. *Landscape Ecology, 25,* 1–4.