European Commission

HANDBOOK OF

SUSTAINABLE URBAN DEVELOPMENT STRATEGIES

Joint Research Centre

EUR 29990 EN

HANDBOOK OF

SUSTAINABLE URBAN DEVELOPMENT STRATEGIES

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EU Science Hub

https://ec.europa.eu/jrc

JRC118841

EUR 29990 EN

PDF ISBN 978-92-76-13673-6 ISSN 1831-9424 doi:10.2760/32842

Print ISBN 978-92-76-16425-8 ISSN 1018-5593 doi:10.2760/020656

Luxembourg: Publications Office of the European Union, 2020
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How to cite this report: Fioretti, C., Pertoldi, M., Busti, M. and Van Heerden, S. (eds), *Handbook of Sustainable Urban Development Strategies*, EUR 29990 EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-13673-6, doi:10.2760/32842, JRC118841.

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MONITORING

Contributors

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Monitoring constitutes a fundamental pillar in the design and implementation of Sustainable Urban Development (SUD) strategies. This corresponds to the increased results-orientation of the European Structural and Investment Funds (ESIF), which advocates clear articulation of the specific objectives of programmes. A stronger focus on results should not be seen as a mere obligation, but rather as a main outcome of mounting evidence that results-oriented frameworks and proper monitoring have important advantages. More specifically, SUD strategy monitoring produces the following three benefits:

- **It provides managing authorities (MAs) and urban authorities with timely information on progress**, which allows for a quick identification of issues, and refocusing on strategic priorities when needed. In this sense, monitoring systems are crucial 'early warning systems'.
- **It supports the data needs of SUD strategy evaluation**. In order to carry out SUD strategy evaluation, policy-makers, stakeholders and beneficiaries need information about the effectiveness of the strategy. Monitoring supplies evidence for this purpose.
- **It strengthens transparency and legitimacy.** On the one hand, monitoring systems can clarify and communicate the rationale of SUD and its results to policy practitioners, stakeholders and citizens. On the other, broad engagement with different organisations, groups and citizens in the design and implementation of monitoring processes raises awareness and strengthens the commitment of local communities to SUDs.

The long history of EU regional and urban policies suggests that MAs are already familiar with the design and implementation of monitoring systems and processes. However, SUD strategies are relatively new instruments and there are specific issues related to the development of their monitoring frameworks. SUD strategies take an integrated approach to urban development, and many, if not all strategies entail that different components of the strategy interact

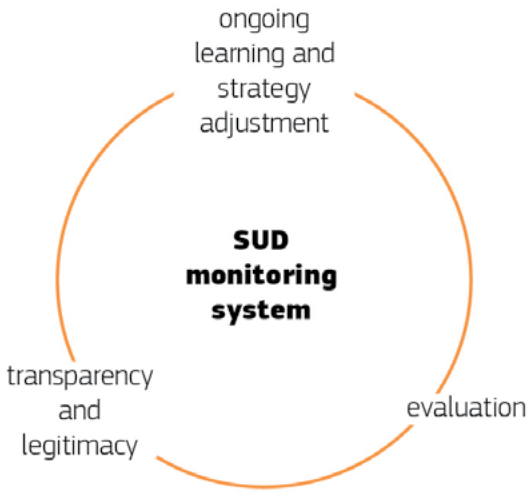

FIG. 1. SUD monitoring rationale
Source: Polverari, 2015.

and reinforce each other in their working. Thus, SUD strategy monitoring often requires multi-sector monitoring, while also taking into account the overall effect of the integrated approach. Furthermore, many strategies are intended to generate less tangible effects (e.g. increase social cohesion, strengthen community trust) that require special measurement methods. Moreover, SUD strategies are always part of a broader context, which may mean taking account of sustainability objectives that have been set at regional, national or supranational levels.

This chapter supports SUD strategy monitoring by reviewing its key concepts and methodologies, and by providing links to additional material and sources of support when relevant. It includes several practical examples that can serve as cases of good practice. The chapter is structured around three main sections that each focus on a specific component of SUD strategy monitoring and discuss one or two related challenges:

- **monitoring framework**; seeing how to put the key concepts of monitoring into practice, discussing ways to measure the effect of an integrated approach;
- **data collection and management;** discussing how to collect and manage data for interventions that are expected to have tangible effects, as well as for those that are expected to generate intangible effects;
- **parallel objectives;** discussing how monitoring of local objectives can be aligned to regional, national, or global sustainability agendas.

All sections conclude with recommendations regarding the design and operation of SUD strategy monitoring, based on lessons learned from the 2014-2020 programming period, and with a view to the 2021-2027 programming period.

MONITORING FRAMEWORK

In this section we address:
How to put the key concepts around monitoring into practice?
How to monitor and assess the effects of an integrated approach?

There is a substantial range of support available to authorities involved in monitoring sustainable development, either specifically focused on SUD strategies under cohesion policy, or sustainable urban development in general.

The Directorate-General for Regional and Urban Policy (DG REGIO) of the European Commission (EC) provides methodological guidance on integrated sustainable urban development, specifically referring to the implementation of SUD strategies. As regards monitoring, the guidance summarises the requirements for the composition of the Monitoring Committee (MC), as well as the requirements for setting up a monitoring system (EC, 2016).

In addition**, there is a specific EC guidance document available on monitoring and evaluation under the Cohesion Fund (CF) and European Regional and Development Fund (ERDF) for the 2014-2020 programming period**. This document explains the key concepts surrounding monitoring and evaluation, and offers some practical points for implementation (EC, 2014).

Building on these documents, the key concepts around monitoring will be discussed in the following paragraphs, providing links to additional material when relevant. A shared understanding of the main concepts should form the basis of their practical application.

How to put the key concepts around monitoring into practice?

In the 2014-2020 programming period, more explicit efforts have been made to design programmes according to a logical framework. The logical framework (or intervention logic) is a way to describe a 'results framework' and can be seen as a tool for monitoring the effectiveness of a programme, strategy or action plan. Programmers start with an assessment of the need to be addressed. Then, they identify the results to be achieved through interventions that will fulfil this need. For example, if the need is to decrease the number of road traffic incidents, possible interventions are creating better road signs, improving driver

behaviour, or changing behaviour towards public transport. Thus, the point of departure is a need, and the means to fulfil that need, rather than the resources available. Essentially this implies a reversal of the traditional input-driven logic that has dominated the programming approach until recently. Intervention logic should lead to a 'clearer articulation of the policy objectives [which] is key to implement a results-oriented policy and moving away from an excessive focus on the absorption of funding' (EC, 2014). Therefore, more emphasis is being placed on monitoring to examine whether the anticipated results are being achieved (or whether efforts should be re-targeted).

Within the logical framework**, specific objectives should define the change that a strategy intends to achieve in a measurable and realistic way**. In general, it takes significant time to define these specific objectives, since it not only requires careful wording, but also the inclusion of relevant stakeholders (who might all have different objectives). It might be wise to appoint a facilitator to guide the discussion in the most objective way. **To clearly define specific objectives, complex terminology should be avoided, consistently using the key terms, and formulating them in individual sentences.** In this respect, it might be helpful to phrase the objective by using a verb that expresses change, e.g. 'to reduce…', or 'to improve…' (URBACT, 2016). Once the specific objectives are defined, indicators should reflect on the intervention logic behind the objectives. Thus, a specific objective could be: to decrease the number of road traffic incidents on the city ring road.

Clearly defined indicators are essential for monitoring SUD performance. An indicator quantifies data so that it can be structurally measured and monitored in order to determine whether change is taking place. Indicators should be closely linked to investment activities and regularly measured. As regards SUD strategies, there are several main types of indicators that play a role. The main objective is to track progress towards the target values by means of so-called output and result indicators.

Result indicators are defined as indicators that describe a specific aspect of a result, being a feature that can be measured. **Result indicators require a baseline value, which is usually the value of a result indicator at the beginning of the programming period**. This baseline value can be derived from existing statistical or administrative data. However, especially for smaller interventions, it may be necessary to first collect this information, for example by conducting a survey. Next to a baseline value, **result indicators should have a target value, which refers to the actual result that is aimed for**. However, it should be noted that some results may not be immediately visible and therefore it might be necessary to take this delay into account. For example, a baseline value for a result indicator might be 148 accidents reported per year on the

city ring road. The target value for this result indicator could then be set at 100 accidents per year (a decrease of more than 30%).

To ensure their quality, indicators have to meet certain criteria. According to the Better Regulation guidelines of the Commission[60], these should be:

- **relevant**, i.e. closely linked to the objectives to be reached;
- **accepted** (e.g. by staff, stakeholders). The role and responsibilities of the indicator need to be well defined;
- **credible** for non-experts, unambiguous and easy to interpret. Indicators should be as simple and robust as possible;
- **easy** to monitor (e.g. data collection should be possible at low cost);
- **robust** against manipulation (e.g. administrative burden: if the target is to reduce administrative burdens to businesses, the burdens might not be reduced, but just shifted from businesses to public administration).

Be careful!

Finally, it is important to note that **when it is expected that indicators will observe change in people, they require a careful definition of the target population**. In this case, indicators should usually aim to measure change in the wider underlying population, rather than just in the group that is specifically targeted. For example, if the aim is to reduce unemployment among those aged between 14 and 16 years old, the result indicators should measure the change in overall youth unemployment in the relevant area. This way, the results of the specific policy will still be distilled, rather than picking up trends that are general to the overall youth population. Also, it can help detect undesired side effects; like reducing unemployment among 14-16 year olds, but increasing it among 16- 18 year olds (URBACT, 2016, p.21).

Output indicators typically describe the product of the resources spent (e.g. money, time, effort) based on the policy interventions. They measure the direct outputs of the programme. In principle, they should cover the investment priorities of a programme and be derived from its intervention logic and actions. Therefore, output indicators are based on agreed definitions and measurement units to be used in operational programmes (OPs), facilitating aggregation at the national and EU level.

EU regulation[61] provides a list of **common output indicators** according to several types of interventions. This list includes indicators which measure aspects of SUD in a general way, e.g.: solid waste (measuring waste recycling capacity in tonnes/year); water supply (measuring additional population served by improved water supply); open spaces created (measured

[60] https://ec.europa.eu/info/sites/info/files/file_import/better-regulation-toolbox-41_en_0.pdf

[61] (EU) No 1301/2013.

in square metres), or rehabilitation housing in urban areas (measured in housing units). It should be noted that these common output indicators normally apply to the ERDF **and that they may be complemented by programme-specific output indicators, although the Commission recommends the use of common indicators as much as possible.** Furthermore, SUD strategies that are implemented by means of integrated territorial investment may include investment priorities coming from other ESI funds, meaning that each SUD strategy should consolidate its own set of indicators.

Overall, it can be stated that is easier to measure output than results, as outputs are directly linked to project activities and financial inputs. For example, if the specific objective is to decrease the number of road traffic accidents on the city ring road, relevant interventions could be improving road signals, improving driving behaviour, or encouraging people to use public transport by building a new circle train. If the latter intervention is chosen, the output indicators could measure the kilometres of newly constructed railroad. However, the effect of this new railroad (output) on the number of traffic accidents (result) is less straightforward, given that many more factors may affect this outcome. **In short, outputs refer to what has been done, and results refer to what has been achieved** (URBACT, 2016)**.**

Figure 2 illustrates objectives, results and outputs within a simplified logical framework for the purposes of programming, monitoring and evaluation. In line with the integrated approach, it is expected that projects allocated to the interventions should tackle economic, environmental, climate, demographic and social challenges in urban areas, while taking into account the need to promote urban-rural linkages.

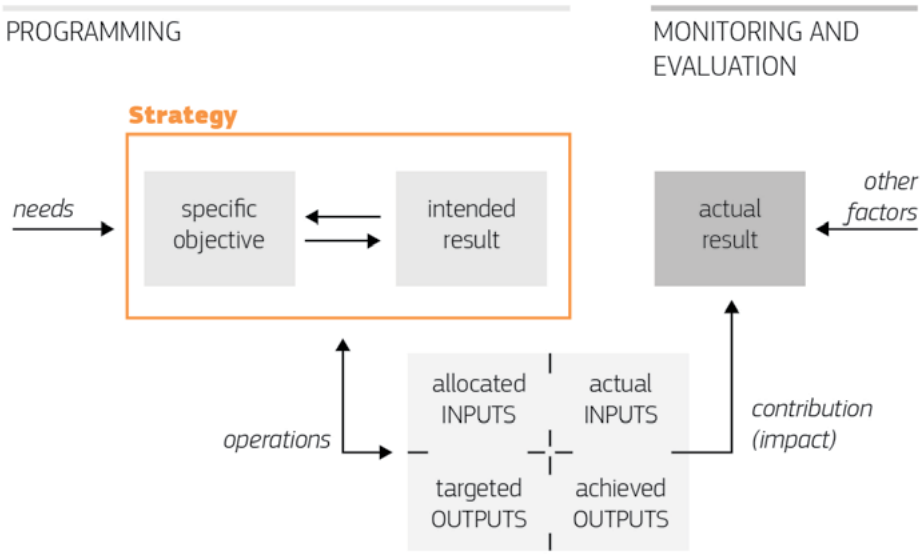

FIG. 2. Logical framework scheme for programming, monitoring and evaluation
Source: EC, 2014.

In 2016, URBACT published a guide on how to use the results framework (logical framework). This guide is considered particularly useful for those cities that are working with an SUD strategy. Please see the box below.

Additional resource

URBACT (2016) URBACT GUIDE: APPLYING THE RESULTS FRAMEWORK TO INTEGRATED ACTION PLANS

The main purpose of the guide is to provide guidelines on how to use the results framework within an URBACT network, and especially within the URBACT Local Groups. **It discusses key concepts (e.g. intervention logic, targets, baseline, result and output indicators, milestones, monitoring and evaluation)** in an accessible way, describing monitoring as 'the routine collection of information about progress of the activities, outputs and results of the projects within the action plan' (p.30).

The guide further discusses how to determine specific objectives (what is the desired change?), how to define result and output indicators to measure what will be achieved, how to collect data for result indicators, and how to perform monitoring and evaluation.

Along with suggestions and guidelines, the **guide offers multiple practical examples to illustrate and clarify key concepts.** For example, the difference between specific objectives, result indicators and output indicators is illustrated as follows:

Specific objective	Result indicator	Result indicator baseline	Result indicator target value	Output indicator
Increase the energy efficiency of office buildings in the metropolitan area	Average energy usage of office space (kWh/m2/year)	242 (2015) (kWh/m2/year)	220 (2019) (kWh/m2/year)	- m^2 office space refurbished - Number of office workers trained in e-efficiency

For more information

https://urbact.eu/files/applying-results-framework-integrated-action-plans
https://urbact.eu/sites/default/files/measuring_performance_implementation.pdf

How to monitor and assess the effects of an integrated strategy?

One of the key challenges facing SUD strategies is that SUD indicators combine measurement of a specific sector or policy theme

with assessment of integrated territorial effects. It can be challenging to ensure that integrated territorial effects are captured alongside particular sectoral contributions related to thematic objectives (TOs) or investment priorities (IPs) of OPs. Thus, consideration should be given to how to link integrated territorial investments with impact on development in the territory across sectors. There are different approaches to addressing this challenge.

One way is to first break down different dimensions (and sectors) involved in the strategy. This approach departs from the assumption that all components should be effective in order for the strategy to be effective as a whole. **When all components show the desired effects, it is likely that the entire strategy as a package has also been effective.** Once the analysis of all sectors/dimensions has been conducted, the authority can weigh up whether additional indicators are needed to monitor impact that is specific to the interaction of two or more dimensions.

For example, the Maribor (SI) SUD has several pre-defined sets of indicators in the strategy, organised under five different headings: Self Reliant Maribor (e.g. number and effectiveness of SMEs, startups etc., lower social transfers); Mobile Maribor (e.g. share of public transport, share of cyclists and pedestrians commuting etc.); Smart Maribor (e.g. level of satisfaction of citizens with the administration, transformation of neighbourhoods and communities etc.); Urban Maribor (e.g. indicators of tourist visits and attractiveness etc.); and Grounded Maribor (e.g. environmental indicators etc.). Each project is advised to define additional indicators at the project level[62].

Furthermore, **departing from (existing) theory, evaluation can be carried out as to how far the intervention logic of the different components fits with each other and whether they are likely to create synergies**. Put differently, building upon theoretical assumptions, the individual effect of 'integration' is assessed. This method examines the effect of integration more from a process point of view.

Moreover, **methodologies can be developed for assessing the effect of an integrated strategy. This option usually requires some advanced research skills**. For large programmes, such assessments are usually based on macroeconomic models. Another method is to perform a counterfactual impact evaluation, whereby the situation of the territory that has received investment is compared to the situation of an unsupported territory (EC, 2016). However, this method is mostly used to examine larger territories, since it is easier to find counterfactuals for these.

Acknowledging that guidance on how to measure impacts of integrated investment is not yet very explicit, the EC currently examines how far a wider

[62] Also see the presentation given at a UDN event in Ghent 1-2 December 2016: https://ec.europa.eu/regional_policy/sources/conferences/udn_ghent_2016/Maribor.pdf

harmonisation across ESIF indicators is feasible[63]. In this context, assessments are specifically carried out to determine whether common indicators can be used for several sectors simultaneously to capture the territorial dimension. **Work is also ongoing on identifying territorial indicators and measurement methods that can link different policy sectors to sustainable development and territorial cohesion.** In this respect, the European Observation Network for Territorial Development and Cohesion (ESPON) has developed a set of indicators to support policy development for territorial cohesion. Please see the box below.

Additional resource

ESPON: INDICATORS FOR INTEGRATED TERRITORIAL AND URBAN DEVELOPMENT

ESPON's working paper uses two fundamental questions as jumping-off points:

- How far is it possible to measure the move towards integrated territorial and urban development?
- What kind of indicators and data types are needed to capture the impact of integrated investments on territorial and urban development across sectors?

Looking at different themes and application contexts, ESPON suggests a set of indicators that can be used to measure the impact of integrated investments on an aggregate level. Most of these indicators should not be used as direct result indicators (measuring the exact achievements of the strategy); rather, they are suitable for assessing policy by monitoring, evaluation, or benchmarking.

For example, the indicators 'long-term unemployed as a proportion of total unemployed' is likely to provide information on economic development and possible structural problems. If large groups of people are long-term unemployed, social exclusion could be an underlying factor. When the number of long-term unemployed decreases, this could point to an overall positive effect of integrated investments that were targeted to fight social exclusion.

ESPON further offers suggestions for the use of composite indicators, and provides several policy recommendations for the EU, national and regional level, such as the following.

[63] It is suggested that for this purpose three levels of indicators can be identified: output indicators (deliverables of the interventions, direct result indicators (immediate achievements specifically linked to the interventions), and policy result indicators (the intended outcome in terms of economic and societal challenges addressed by the policy interventions).

- While it would be useful to have a Europe-wide methodology and indicators list, cities/metropolitan areas are encouraged to take responsibility for formulating specific and sound visions, with tailored indicators for the main objectives/priorities, and to translate 'integrated territorial development' into their specific contexts.
- Data availability might be an issue in many cases, so the indicators presented in the working paper are not an off-the-shelf solution, but need to be adjusted depending on the national/regional context.
- Registered statistics may often prove to be a better source of data than official statistics. In many instances, information included in national registers is overlooked because of possible non-compliance with statistical standards; however, careful examination of data can remedy this problem.
- If integrated territorial development strategies cover several administrative territories, it is worth examining the spatial distribution of indicators such as dispersion and clustering.

For more information

https://www.espon.eu/integrated-indicators

Finally, **some authorities have also started to experiment with composite indices that integrate different dimensions together in order to measure and monitor the evolution of territories.** The advantage of an index (or composite indicator) is that it provides a single value for all indicators combined. As such, complex information can be presented in an easily understandable way. For example, ESPON (2016) has developed a fairly easy-to-understand 'polycentricity index' that consists of three equally weighted indicators (urban structure, accessibility, and territorial cooperation). Assuming that integrated territorial investments intend to make territories more polycentric, this indicator can be used to measure the impact of integrated investment in a single quantitative value.

Be careful!

However, there are important caveats to bear in mind when using composite indicators. **Even if data can be combined and weighted, it remains an analytical challenge to aggregate social, environmental, economic and institutional metrics into a composite indicator that can be compared on both spatial and temporal levels.** It is difficult

to produce a meaningful aggregation of diverse metrics, and this requires advanced methodological knowledge, especially as the weights of the selected indicators can have a substantial influence on the final value of the composite indicator and are sometimes only a general representation of the impact of policies or investments in question (Colantonio & Dixon, 2009).

The EC Joint Research Centre's (JRC) Competence Centre on Composite Indicators and Scoreboards has experience in building composite indicators and can be consulted on the technicalities around finding the best methods and approaches. Also, the EC has developed some concrete proposals on regional composite indicators which can serve as inspiration for developing composite indicators that could be adapted to local circumstances: the European Regional Competitiveness Index (NUTS 2 level); the European Regional Inclusive Society Index (NUTS 2 level); and the European Social Progress Index (NUTS 2 level)(ESPON, 2018).

Additional resource

EUROPEAN POLICIES RESEARCH CENTRE (EPRC) MEASURING INTEGRATED TERRITORIAL AND URBAN STRATEGIES: CHALLENGES, EMERGING APPROACHES AND OPTIONS FOR THE FUTURE

This report discusses methodologies for measuring the effectiveness of sustainable urban development strategies and integrated territorial investment. It specifically elaborates the development of indicators for territorial provisions, highlighting the key considerations involved in assessing the achievements of strategies. The report identifies several frequently used indicators to assess achievements (results) of integrated strategies, such as:

- vacancy rate within cities
- levels of satisfaction of residents living in relevant areas
- reduced air pollution
- public transport use as a share of total passenger transport

For more information

https://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/integrated_strategies/measuring_integrated_strategies_en.pdf

Finally, it is worth noting that other EU-funded instruments implemented in Member States can provide support in the design and implementation of SUD monitoring. For example, Smart Specialisation Strategies are place-based national or regional innovation strategies

that are monitored by tracking the developments related to policy interventions within the strategy's specific priority areas. The monitoring mechanism should be able to capture and track the relevant expected changes that are foreseen in each priority by means of an appropriate choice of result indicators; it should also capture and follow the policy output that ought to make expected changes happen. For those territories that have limited experience in this field, it is suggested to begin developing internal capacities and experience starting with a simple indicator system. The Joint Research Centre offers several sources of support, including a Massive Open Online Course (MOOC) on strategy monitoring.

RECOMMENDATIONS

- Make sure the monitoring system follows the logical framework, moving from needs (what has to be addressed?), to specific objectives, (what is the desired change?), to indicators (how can this change be measured?).
- Make sure that specific objectives define the change a strategy intends to achieve in a measurable and realistic way:
  - be careful about wording, and keep terminology simple and consistent;
  - try to formulate the specific objectives in a single sentence;
  - if needed, use a neutral facilitator to guide the discussion about the specific objectives among all relevant stakeholders;
  - to formulate the specific objective, use verbs that imply change, such as 'to reduce…, to improve…, to widen and access…'
- For many administrations, a lack of human capacity and/or methodological skills can be an issue. Consider the use of EC technical assistance to increase staff capacity and/or other sources of support to provide training on data and methodologies for staff working on monitoring (e.g. collaboration with local universities).
- Explore the options for bringing in external expertise and stakeholders to support with the design of the monitoring framework.
- If possible, design the monitoring framework from a long-term perspective. Longitudinal data (repeated measurements over time) is key to high-quality monitoring:
  - Ideally, the monitoring framework can also be used to monitor future sustainable urban development initiatives.
- Explore several ways to examine the effects of an integrated approach.
  - The 'easiest' way to monitor (and evaluate) an integrated approach, is to first assess the effectiveness of all components separately, assuming that if all components have been effective, the strategy as a whole has also been effective.
  - Also, based on theory, an assessment can be carried out as to how far the intervention logic for the different components fit with each other

and whether they are likely to create synergies. Such examination of the 'integrated' process can support ex-ante evaluation, or monitoring during the programme.

- Finally, depending on available capacity, macroeconomic models can serve to assess the effect of an integrated programme as a whole. Another method is to perform a counterfactual impact evaluation, whereby the situation of the territory that has received investment is compared to the situation of an unsupported territory.

DATA ON TANGIBLE AND INTANGIBLE EFFECTS

In this section we address:
What kind of data is needed to capture the tangible and intangible effects of urban development across sectors?

What kind of data is needed to capture the tangible and intangible effects of urban development across sectors?

SUD strategies can produce tangible and intangible effects. Examples of tangible effects are an increase in households that live within 500 metres of a public transport stop, or a decrease in air pollution. A less tangible result of SUD is increased social cohesion in the neighbourhood, or an improvement in (perceived) quality of life. In that respect, intangible effects often refer to people's perceptions and beliefs, and require more subjective measurements. In particular, strategic urban planning with an emphasis on the social dimension (e.g. education and skills, housing, participation and empowerment, social mixing, employment, or demographic change) is expected to cause intangible results. However, intangible effects are not restricted to this dimension. **In order to cover all aspects of the SUD strategy and to obtain an overall idea of the situation, the monitoring of both tangible and intangible effects should be considered.**

Data collection for the measurement of intangible effects often relies on surveys, interviews, observational methods, and focus groups. Survey design entails a trade-off between obtaining enough information and the time respondents need to spend to complete the survey. Clearly, the longer it takes to conduct the survey, the less likely people are to participate and concentrate. A choice also has to be made between open and closed questions, or a mix of both. Open questions probably provide

more detailed information, while data from closed questions are easier to process and compare.

A common way to construct a closed question is using the Likert scale. The Likert scale is a rating scale whereby respondents are asked to agree or disagree with a statement or belief using a five- or seven-point answer scale. Often this scale includes a neutral midpoint. An example of such a question is: *Please indicate the extent to which you agree or disagree with the following statement: 'I feel part of this neighbourhood'. Please select one of the following options: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.* Interviews and focus groups also require careful consideration of questioning. Questions should not be leading, respondents should feel 'safe' to express their opinions, and a focus group should provide all participants with an equal chance to speak up.

In general, all these methods of data collection are prone to (self-) selection bias, whereby the people who are most active in the neighbourhood are also the most likely to participate to a survey, interview and/or focus group, It is also important to reach people who are less actively involved in the community. Furthermore, to increase the chance that all types of people living in a specific territory are included, it is advisable to reach out to people at different times of the day and on different days of the week (reaching those that work during the day/evening etc.). **Combining two or more methods to collect the data (e.g. focus groups and a survey) enhances the credibility of a study.**

Learning from practice

MEASURING SOCIAL COHESION AND QUALITY OF LIFE IN ROTTERDAM (NL)

Rotterdam has developed several indicator systems to assess and monitor social developments in its neighbourhoods. One of these is the **Social index** that specifically analyses neighbourhoods' social qualities, collecting and aggregating data along four dimensions:

1) Personal abilities (language skills, health, income, and education)
2) Living environment (level of discrimination, housing, pollution, public facilities, etc.)
3) Participation (going to school/work, social contact, social and cultural activities, etc.)
4) Bonding (mobility, 'feeling connected' etc.)

The index produces a score between 0 and 10, serving the purpose of:

- measuring the social qualities of a place at a given time.

- showing and comparing the differences between 64 out of the 80 Rotterdam districts,
- providing a baseline for assessing policies.
- analysing the strengths and weaknesses of each neighbourhood in terms of the four dimensions.

Rotterdam also uses a **Safety Index** that combines objective data on the number of crimes committed and reported with subjective data such as perceptions of safety. This index also produces a score between 0 and 10 which indicates the safety level of a neighbourhood. Both the Social and Safety indices are based on both statistical and survey data.

These indices have become essential tools for assessing urban development, and specifically regeneration projects in the city. However, the process of data collection carries significant cost implications. For this reason, the Social Index is now run on two-yearly basis, instead of annually. The city is looking into ways to develop alternative cost-effective methodologies for conducting local surveys, such as involving local communities, or using proxy indicators to measure softer impacts. Another issue is the mobility of residents (e.g. moving out of a neighbourhood after their situation improves), which makes it difficult to trace the effectiveness of local projects. In these situations, authorities must decide whether people-based indicators or area-based indicators are most useful.

For more information

https://wijkprofiel.rotterdam.nl/

Whereas intangible effects are often measured using qualitative data (measuring approximations, descriptions and concepts), tangible effects are generally measured using quantitative data. Quantitative data concern measures of values or counts, expressed in numbers. It describes quantities, and can answer questions such as 'How many?', 'How much?', and 'How often?'. For example, quantitative data measure the number of people that use public transport during rush hour, or the micrograms of air-polluting particles per cubic meter (µg/m^3). Because quantitative data consist of counts and numbers it is well suited for (advanced) statistical analysis. In contrast, qualitative data are often analysed by means of a narrative, describing patterns, connections, relationships, and/or themes. **However, it is also possible to amend**

more qualitative information, such as attitudes or beliefs, to quantitative data, for instance by using a Likert-scale.

The type of data collected depends not only on what kind of information is desired, but also on human capacity and data availability. In some Member States, the introduction of integrated urban approaches represents a continuation of domestic practices, albeit with some changes. **The benefits of having SUD embedded in a broader domestic strategy are apparent in the availability of a set of dedicated indicators and datasets**. Moreover, there is often strong capacity and experience for monitoring territorially integrated initiatives.

Moreover, where city-wide monitoring systems have been developed, they often fulfil an important role in the selection of SUD priority areas for intervention, and in progress assessment at the project and programme levels. For example, Antwerp (BE) uses urban scans based on geodata and statistical information to monitor and measure data on priorities such as housing, green space availability, air and noise pollution levels, walkability and access to public transit. This allows policymakers to develop integrated strategic projects, and make informed spatial decisions. Two online platforms allow these data and maps to be shared with city employees, citizens, companies, project developers and other cities. **The project is named as an URBACT good practice**.

In other territories, integrated, strategic urban development initiatives represent a relatively new approach. SUD involves new ways of working, with multiple goals relating to behaviour and outcomes, raising issues concerning limited capacity and experience for monitoring these new approaches. Beyond this, there are challenges concerning the availability and quality of data. Nevertheless**, in several Member States initiatives are underway at national and sub-national levels to develop capacities to provide a stronger base for SUD monitoring**, such as in Poland and Hungary.

In Hungary, work is ongoing to increase the use of data in urban authorities. This involves developing a Smart Cities Index with a range of themes, indicators and data sources (statistical data, surveys, map-based analytics). One key to the process is the development of an electronic interface to support local governments, a focus on international good practice, and a unified web platform for urban planning.

In Poland, monitoring of urban policy implementation is part of a general development policy monitoring system that uses the STRATEG data base (including sets of indicators on the national

and European level). To implement its National Urban Policy, the Ministry of Investment and Economic Development cooperates with the Central Statistical Office in updating and developing appropriate indicators and methodologies. The Urban Policy Observatory is also involved, conducting monitoring and research in the field of urban policy. As a result, a range of support for SUD is being developed: monitoring studies, data integration and sharing (including databases, geo-portals), dissemination of knowledge, education and contribution to the debate on urban policy in Poland (including congresses of urban policy, revitalisation congresses, and workshops) (Ministry of Investment and Economic Development, 2019).

Furthermore, **technological advances in information generation and communication provide increasing possibilities to collect data for SUD monitoring.** There is growing interest in the potential of processing and networking capabilities to open up new methods of working within and across administrations. New sources of knowledge relating to urban domains can be accessed through so-called 'big data', including censuses, household, transport, environment and mapping surveys, social media and commissioned interviews and focus groups. New ways for policymakers to connect with stakeholders to improve urban development interventions are being explored. **Citizens are encouraged to play an active role in defining indicators for their city, and to participate in the collection and consideration of data**.

For example, **the European Network of Sustainable Urban Mobility Plans (SUMP) points to cycling apps that gather data for local transport planners**. The raw data coming out of these apps are not always easily interpreted for monitoring, but guidance and tool-kits are being developed for this. As a case in point, the NISTO project, supported by the INTERREG IVB North-West Europe programme has developed a toolkit to monitor smart mobility and guidelines to convert sensor data from smartphones (e.g. GPS) into indicators that can be used in monitoring.

Moreover, the JRC has gathered a range of data and tools to support SUD implementation. For example, with the support of DG REGIO they have developed **the Urban Data Platform plus (UDP+). This platform contains information on 807 cities, 673 functional urban areas and 271 metropolitan regions.** It includes longitudinal data (repeated measures over time) on a wide variety of indicators, covering population dynamics, the economy, the labour market, education, research and innovation, social issues, transport and accessibility, environment and climate, governance, and security and safety. All data are publicly accessible and downloadable, and can serve to provide baseline information or as source of inspiration. Note that if the desired indicator is not publicly available, a proxy indicator may be considered. **A proxy indicator is an indirect**

measure of the desired information, offering a fair approximation of it. For example, the incidence of childhood asthma might serve as a proxy measurement of air quality.

Finally, **given that technological advancements are making more and more data available, authorities may also benefit from partnerships with private actors or research institutes**. Public and Private Partnerships (PPPs) may greatly contribute to the implementation of a cross-disciplinary and cross-sectoral assessment and monitoring system. PPPs can be based on exchange of data, knowledge and skills (Colantonio & Dixon, 2009).

Once data (quantitative or qualitative) have been collected, it is essential that the data are structured in a clear way. It is advisable to keep the data in one central file or program, with back-ups. Indicators should have a clear descriptive name, as well as clear descriptive values. Furthermore, it is suggested that authorities use a dashboard to support sharing and monitoring of data. **A dashboard is an easy-to-read overview of the key monitoring data, showing current status and progress towards targets for the various indicators in a visual way** (URBACT, 2016). The database should be continuously maintained by performing updates and corrections when necessary. It is also necessary to check that the **data comply with the General Data Protection Regulation (GDPR).**

RECOMMENDATIONS

- Collect a combination of quantitative and qualitative information to cover all components/dimensions of the strategy.
  - Ideally, indicators that measure tangible effects are complemented by indicators that measure intangible effects.
  - A quantitative framework (based on counts and numbers) can be complemented by a qualitative assessment of interventions (perceptions and attitudes) to obtain the bigger picture.
  - Participatory approaches, including citizen engagement, are crucial in setting relevant goals and indicators and guaranteeing commitment. For example, use surveys or questionnaires to measure residents' levels of satisfaction.
- Take timing into account. Some indicators used for measuring the territorial impact of integrated investments require time to capture effects, particularly for intangible results.
- Make sure to select a representative sample of respondents in order to consult beyond the 'usual suspects'.

- Invest in cost-effective data-gathering procedures and methodologies. See how far data already collected by the city, regional, national or EU statistical sources can be used.
- Make sure to document the framework, methodology and indicators. Provide enough detail so that others not directly involved (or those that will be involved in the future) can replicate independently.
- Consider using a dashboard to support sharing and monitoring of data. A dashboard is an easy-to-read overview of key monitoring data, which shows current status and progress towards targets for the various indicators in a visual way.

DIFFERENT LEVELS OF OBJECTIVES

In this section we address:
How can local objectives be aligned with regional, national or global sustainability agendas?

How can local objectives be aligned with regional, national, or global sustainability agendas?

Another broader challenge when monitoring SUD strategies is to align their results framework to objectives and goals that have been set at different administrative levels. Many, if not all, SUD strategies are designed and implemented within a context of local, regional, national, and/or supranational agendas.

At the urban level, SUD implementation should be coordinated as much as possible with other initiatives and systems which are being implemented in the urban areas. This may include the alignment or coordination of monitoring systems. However, the extent of alignment varies, depending on the size and scope of urban-level initiatives. In some cases, there are interesting examples of alignment, such as in Vienna (see the box below).

Learning from practice

SUD AND CITY MONITORING – SMART. MONITOR, VIENNA (AT)

In Vienna, SUD implementation is monitored within the ERDF OP monitoring system. However, SUD monitoring is also supported

through monitoring of the Smart City Vienna Framework Strategy. Led by the city's Department of Urban Development and Planning, the strategy was designed independently from cohesion policy programming.

As a framework strategy, it provides reference points for many existing sectoral strategies, covering areas such as planning, energy environment, mobility, innovation, health and the digital agenda. The three key areas the strategy focuses on are quality of life; resources; and innovation.

As part of this initiative, an exploratory project, called SMART.MONITOR developed a monitoring concept for the framework strategy. The results of the project are practical recommendations for monitoring the progress of the framework strategy, and this has supported SUD monitoring. Initial reviews of SMART.MONITOR have highlighted some important points:

Choice of indicators. Although the chosen indicators generally provided a good framework, some indicators require more precise definitions, while additional indicators have also been proposed to deliver a more comprehensive overall picture.

Data management. The first cycle of monitoring showed the high added value of and need for an exchange of data beyond municipal institutions to increase awareness and avoid duplication. A clear overview of all data and centralised access is considered very valuable.

Dialogue and cooperation. Despite the involvement of many departments and associated organisations, it was felt some actors could still be more strongly involved. Also, emphasis was put on the continuity of staff involved in the monitoring process**.**

Monitoring interval. To ensure that the monitoring process evolves into an effective support tool for the strategy, monitoring intervals should be kept as short as possible. This keeps momentum high and avoids (re)training of staff. The exact interval should be based on a cost-benefit analysis.

For more information

https://smartcity.wien.gv.at/site/en/the-initiative/monitoring/

At OP level, there are challenges in setting indicators based on local needs alongside those determined in the priorities and measures of ESIF OPs. The multi-dimensional character of SUD makes

it possible to integrate a wide range of interventions in several sustainability-oriented domains. For this reason, a limited number of ESIF programme indicators may not be sensitive enough to capture the specific focus and impact areas of SUD strategies. In such cases, it may be necessary to use more specific indicators. For instance, specific SUD-related 'strategic' indicators, linked to programme priorities and measures can be used to strengthen alignment. Several examples of such indicators have been identified, many of which can be linked to the common indicators used for ESIF programmes (Van der Zwet et al., 2017)

At EU level, **the upcoming review of the Urban Agenda for the EU will highlight the role of urban areas in overarching issues such as climate adaptation, air quality, inclusion of migrants and refugees, housing, digital transition, and the circular economy.** This includes the contribution of SUDs. One of the pillars of the Urban Agenda for the EU is to contribute to and enhance the knowledge base on urban issues and exchange best practices. Following this, many of the action plans that followed from partnerships on specific issues have formulated concrete actions to improve databases and data collection. Ideally this should result in better data availability, as well as standardisation, facilitating comparison between EU territories.

In terms of monitoring the effect on sustainability, the framework developed by **the global Agenda for Sustainable Development includes 17 Sustainable Development Goals (SDGs) to be monitored using more than 232 indicators and 169 targets**[64]. SDG number 11 concerns 'Sustainable Cities and Communities' and specifically addresses the monitoring framework related to urban settlements, including aspects related to housing, mobility, governance, water, and rural-urban synergies. In addition, other SDGs include urban-based targets, e.g. city product per capita (8.1.1), women in local government (5.1.1) and local expenditure efficiency (16.6.1). **The alignment of SDGs at local level can be achieved through a scale-down process known as 'localisation'**[65]. This process takes account of sub-national contexts in achieving the 2030 Agenda, from the setting of goals and targets to determining the means of implementation and using indicators to measure and monitor progress.

Localisation brings city networks and stakeholders together to represent the views of local actors, and encourages the bottom-up monitoring process which is essential to delivering all committed objectives goals. However**, the alignment process demands close coordination efforts, also taking into account any other potential agendas, such as EU, national, and regional ones**.

64 https://www.un.org/sustainabledevelopment/development-agenda/

65 https://www.local2030.org/

Additional resource

ROADMAP FOR LOCALIZING THE SDGS: IMPLEMENTATION AND MONITORING AT SUB-NATIONAL LEVEL

This roadmap was published by the Global Taskforce of Local and Regional governments, the United Nations Development Programme (UNDP), and UN Habitat, to help local and regional governments implement and monitor the SDGs. Support with delivering the 2030 agenda is structured in five parts:

- **Awareness-raising**, getting to know the SDGs at the sub-national level.
- **Advocacy**, including a sub-national perspective in national SDG strategies.
- **Implementation**, localising the SDGs.
- **Monitoring**, evaluating and leaning from experiences.
- **Going forward**, where to go from here?

Links to additional material are provided in the section on monitoring, along with recommendations for establishing monitoring frameworks for localised SDGs.

It is emphasised that local indicators should be linked to those of the 2030 agenda and adapted to each territory's needs and context. Furthermore, local and regional authorities should participate in monitoring and evaluating the SDGs at national level, and the information gathered at local level should be used in national SDG monitoring and reporting. If possible, local governments should set up joint initiatives to create strong sub-national mechanisms. When resources are insufficient, national authorities should collect data from all the different territories in a comprehensive matter.

For more information

https://www.uclg.org/sites/default/files/roadmap_for_localizing_the_sdgs_0.pdf

Furthermore, **the Joint Research Centre, in cooperation with DG REGIO and UN-HABITAT, is working on monitoring the urban dimension of the 2030 Agenda for Sustainable Development.** Some cities and regions have taken the lead and have started producing SDG Voluntary Local Reviews (VLRs), even though no method and indicator framework has currently been agreed upon. To this end, a *European Handbook for SDG Voluntary Local Reviews* (VLRs) is being finalised (Siragusa et al., 2020*).* It provides key examples of official and experimental indicators, which are useful in setting up an effective SDG local monitoring system

specifically targeted at European cities. For each SDG, the Handbook highlights examples of harmonised and locally collected indicators. **Indeed, VLRs are a great opportunity to foster the localisation of the SDGs and to boost their implementation.**

It is also worth noting that the EU-wide network Council of European Municipalities and Regions (CEMR) has developed a **Reference Framework for Sustainable Cities (RFSC)**[66], which is an online toolkit that offers a self-assessment of local strategies or projects. One of the components of this self-assessment is monitoring progress. In this respect, **the RFSC offers a choice between several European and global sustainability frameworks, of which the SDGs form one**. The RFSC states that all SDGs have targets directly related to the local and regional level, and therefore the ability to integrate the SDGS in the design, implementation, and monitoring of local strategies is crucial for achieving these targets. Progress can be monitored by means of sound, relevant indicators coming from city, European, and global databases. The RFSC enables you to choose the indicators that fit your broader framework and allows you to enter values so that you can monitor them (see Cross-Sectoral Integration chapter for a more general description of the tool).

Also, the Organisation for Economic Co-operation and Development (OECD) has initiated a programme to help cities and regions develop, implement and monitor strategies to achieve the SDGs[67]. The programme supports interested cities and regions in fostering a territorial approach to the SDGs by:

- **measuring** where they stand vis-à-vis the national average and their peers.
- **engaging in a multi-level dialogue** with their lower and upper levels of government to build consensus on who can do what, at what scale and how.
- **sharing best practice** and lessons from international experience.

As regards measurement, the OECD foresees a tailored, consensual and localised indicator framework, as well as harmonised and comparable OECD territorial statistics for SDGs. Among other things, learning can take place by pilot testing the indicator frameworks in different contexts. Current pilot cases within EU countries are the city of Bonn (DE), the region of Flanders (BE), and the region of Southern Denmark. The final report *A Territorial Approach to the SDGs: A role for cities and regions to leave no one behind* will be launched at the 2020 World Urban Forum.

66 http://rfsc.eu/#choose-your-framework

67 http://www.oecd.org/cfe/territorial-approach-sdgs.htm

ALIGNING SUD INDICATORS AND 'GLOBAL' OBJECTIVES IN A CORUÑA (ES)

The SUD indicator system in A Coruña is an innovative and coherent instrument that takes into account indicators from several policy levels: (i) Global: UN Agenda 2030, UN Habitat, (ii) European: Indicators of Sustainable Development of Eurostat, (iii) National: the Spanish Urban Agenda, Indicators for SDGs of National Institute of Statistics and Spanish Network of Sustainable Development Indicators.

The integration of inputs from other related policy frameworks is being carried out through a pilot exercise that aims to monitor the SUD territorial specificities in A Coruña on the one hand, and to allow benchmarking exercises between urban areas and cities on the other. For this purpose, three different levels of indicators have been identified:

(1) descriptive indicators, applicable at the general level on the domains of the Urban Agenda,

(2) indicators of Urban Sustainability, also framed at the Urban Agenda level but with a targeted focus on measurement of sustainable actions, and

(3) Monitoring and Evaluation indicators, applicable at the level of the Strategic action plan and aimed at measuring combined actions in terms of overall progress.

Besides alignment with other policy frameworks and the proposed integrated approach, the monitoring system is also designed with a number of basic criteria in mind. According to the monitoring and evaluation committee, indicators should be:

- strongly based on a bottom-up approach;
- standardised, i.e. urban audit type;
- able to measure both local action and Sustainable Development Goals;
- able to measure aspects which are useful within the framework of the Spanish Urban Agenda;
- able to measure the behaviour of the city in relation to its own objectives and strategies;
- able to contemplate different territorial scenarios, (metropolitan areas, districts, neighbourhoods);
- able to integrate gender aspects, i.e. equality and diversity;

- integrated with the city management dashboards, i.e. mobility, assets management, licenses;
- aligned with the model of Spanish Smart Cities.

For more information

www.coruna.gal/agendaurbana

Finally, **no matter what type of monitoring system is established and what framework it sits within, the indicators should be able to reflect desired development on the critical issues as defined in the strategic plan**. The final stage of monitoring should connect measurements back to the diagnostic phase of the strategy. If results after or during implementation do not match the strategy's objectives, the cause of the deviations must be investigated. Based on this analysis, corrective action can be taken, reformulating the strategic plan in the best way possible. After the final review of the strategy, the complete cycle of strategic planning is closed, serving at the same time as a starting point for a new cycle of strategic development.

RECOMMENDATIONS

- Consider how SUD strategy indicators can be aligned with those that apply to city, regional, national, and global level sustainability agendas:
  - ▸ Explore the process of scaling-down, also known as 'localisation' to align with objectives initially set at higher levels.
  - ▸ Explore the available guidance on localising SDGs (e.g. the Global Taskforce of Local and Regional governments, JRC, OECD, RFSC, and UN Habitat).
- Try to establish cooperation between different local authorities to create strong sub-national mechanisms for monitoring higher level agendas.
  - ▸ When resources are insufficient, try to ensure that higher-level authorities collect data from all the different territories in a comprehensive matter.
- Try to ensure that the information gathered at local level(s) is used in national SDG monitoring and reporting. Ideally, local and regional authorities should participate in monitoring and evaluating the SDGs at national level.
- Finally, always keep in mind the distinction between measuring SUD strategy achievements in specific territories and populations, and measuring the performance of EU-funded programmes and priorities or agendas at different levels.

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KJ-NA-29990-EN-N

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doi:10.2760/32842

ISBN 978-92-76-13673-6