SDG Indicators for Municipalities

Indicators for Mapping Sustainable Development Goals of the United Nations in German Municipalities (Summary)

SDG-INDICATORS for Municipalities

A joint project by:
Bertelsmann Stiftung · Federal Institute for Research on Building, Urban Affairs and Spatial Development · German County Association · Association of German Cities · German Association of Towns and Municipalities · German Institute of Urban Affairs · ICLEI European Secretariat · Council of European Municipalities and Regions / German section

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German Institute of Urban Affairs *(Deutsches Institut für Urbanistik)*
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Person responsible: Henrik Riedel, Bertelsmann Stiftung

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Authors: Henrik Riedel / Oliver Haubner / Marc Wolinda, Bertelsmann Stiftung (chapters 1 and 2)

Sabine Drees, German Association of Cities (chapter 2.1 – excursus)

Alexander Kramer, German Association of Towns and Municipalities (chapter 2.2 – excursus; author of the 2nd edition: Deliana Bungard)

Antonia Milbert / Dr. André Müller, Federal Institute for Research on Building, Urban Affairs and Spatial Development (chapter 2.3 – excursus)

Stefan Kuhn, ICLEI European Secretariat (chapter 2.4 – excursus)

Miriam Elsaeßer, German County Association (chapter 2.5 – excursus; authors of the 2nd edition: Miriam Elsaeßer, German County Association / Lucas Milbert, German Association of Cities)

Oliver Peters, German Institute of Urban Affairs – in cooperation with Henrik Riedel, Bertelsmann Stiftung (sections 3 and 4; authors of the 2nd edition: Dr. Jasmin Jossin / Oliver Peters / Philipp Holz / Dr. Busso Grabow)

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Foreword by the German municipal umbrella organisations

Sustainability is not just a buzzword or empty catchphrase. It is something that can be put into practice and shaped on the basis of measurable criteria. What is needed is constant forward thinking and, above all, action. Global and national sustainability goals have always been the yardstick for municipalities. The resilient post-corona municipality that is now being called for makes the extent of sustainability required crystal clear. Municipalities need to be resilient and robust in the face of economic, environmental or social challenges and crises. When it comes to achieving the Sustainable Development Goals (SDGs) of the United Nations Agenda 2030, municipalities play a central role as a place where people live.

The SDG Indicators for Municipalities working group has taken on the task of developing an Indicator Catalogue for municipalities that will enable them to regularly examine the status of all 17 Sustainable Development Goals at a local level. It will play a significant part in developing a sustainability-oriented approach in the municipalities.

The Catalogue presented in this brochure, revised for the second time, contains a manageable number of indicators that have been developed and trialled together with municipal practitioners. This Indicator Catalogue represents a toolbox. Each municipality decides for itself which and how many indicators it will use as a basis for its work with the Sustainable Development Goals. The “control relevance” is thus decided locally in each case.

The SDG Portal (www.sdg-portal.de) provides data on numerous indicators for all Sustainable Development Goals, which are available from central sources for independent cities, districts and, to some extent, also for cities and municipalities belonging to districts. In addition, this brochure contains suggestions for indicators that are qualitatively well suited but not yet available from central sources.

The Portal offers a clear overview of the available data for all cities and municipalities with at least 5,000 inhabitants as well as all districts in Germany, while providing information on short and medium-term developments of the municipalities. The figures are supplemented by good practical examples, reporting tools and further information on the sustainability initiatives taken by the municipalities. The German SDG Portal for Municipalities has also received a lot of attention internationally. After it was awarded the UN SDG Action Award of the United Nations in 2019 (ranking in the top three), Italian municipalities have now adopted the method tried and tested in Germany. In addition, there are other countries also interested in setting up a municipal SDG Portal.

We would like to express our sincere thanks to everyone who was involved in the development of the SDG Indicators and their trialling and revision. Our thanks go to the pilot municipalities, the members of the working group and, above all, to the German Institute of Urban Affairs (Difu), which has worked tirelessly and reliably on behalf of the Bertelsmann Stiftung in developing the Indicator Catalogue.

We hope that the SDG Indicators will continue to be thoroughly utilised at local level. This will allow a clearer picture of the municipalities' input for reporting on the United Nations' Sustainable Development Goals (SDGs) at national, European and international level. We gladly welcome any suggestions and feedback at any time!

Cologne and Berlin, June 2022

Helmut Dedy	**Dr. Kay Ruge**	**Dr. Gerd Landsberg**
CEO	Assistant CEO	CEO
Association of German Cities	German County Association	German Association of Towns and Municipalities

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The SDG Indicators and the SDG Portal for Municipalities

Henrik Riedel / Oliver Haubner / Marc Wolinda, Bertelsmann Stiftung

1.1 Brief synopsis of key points

Even if sustainability is not always on our minds, in Germany, there has never been a better starting position to tackle it than now. We have a German Sustainability Strategy (DNS) at the federal level, sustainability strategies at the state level, and more and more municipalities are beginning to play their part in sustainable development and implementing the 2030 Agenda with the Sustainable Development Goals (SDGs) of the United Nations. The corona crisis has not changed anything, even if it did cause the topic of sustainability to be temporarily ousted from public debates. On the contrary, it presents a great opportunity to relaunch the sustainability debate in the context of the pandemic. Many municipalities are already doing this – new education, mobility or health concepts are just a few examples among many.

Sustainability starts in municipalities – they are the very basis for putting the 17 SDGs and their 169 sub-goals into action. Local communities – where people live and work – are the most sensitised to sustainability, and show greater awareness. Whether sustainable development can ultimately be implemented or not will also be decided in the cities, districts and municipalities. Hence, the way in which municipalities approach the issue of sustainability and the implementation of the SDGs plays a crucial role. In fact, the United Nations High-level Political Forum on Sustainable Development (HLPF) has stated: 'It's cities where the battle for sustainable development will be won or lost.'

Hardly any municipality currently dealing with the issue of sustainability is doing so without taking a closer look at the SDGs and examining how they can be influenced locally. Each municipality is free to do this under its own steam for its own benefit. Each municipal could, for example, develop its own indicators to help measure and monitor status and development in terms of achieving the SDGs. Saying that, it seems that jointly examining and documenting which indicators are well suited for SDG monitoring by German municipalities would be a more efficient and effective approach.

This is precisely the path taken by the working group "SDG Indicators for Municipalities", which was formed by representatives of the Bertelsmann Stiftung, the Federal Institute for Research on Building, Urban Affairs and Spatial Development, the German County Association, the Association of German Cities, the German Association of Cities and Municipalities, the German Institute of Urban Affairs, the ICLEI European Secretariat and the German section of the Council of European Municipalities and Regions.

This publication is the result of five years of joint project work. In spring 2017, shortly after the German Sustainability Strategy was published with its systematic orientation towards the SDGs, work began on developing the SDG Indicators for Municipalities. One year on, in spring 2018, the first Indicator Catalogue was published and the first series of data were posted on the Bertelsmann Stiftung's Wegweiser Kommune (Community Roadmap) portal. The SDG Portal for Municipalities went live at the end of 2018. Immediately after the initial publication of the SDG Indicators, they were trialled in selected municipalities. The first experiences of using the indicators were then evaluated at the beginning of 2019. The results of this evaluation provided the basis for defining priority topics and drawing on practice to refine the SDG Indicators in 2019 and 2020. The second edition of the SDG Indicators was published at the end of 2020. This publication presents the amended version of the Indicator Catalogue, which was partially revised in 2021 and 2022.

During the collection, evaluation and selection of the SDG Indicators, existing Indicator Catalogues and definitions have been consulted to a large extent. Primarily, indicators are proposed that are qualitatively well suited and readily available for use with data. Good availability means that the data can be obtained from central sources at the district and independent city level and, where possible, also at the level of the cities and municipalities belonging to the districts. However, qualitatively (very) well-suited indicators are also recommended, which are not available centrally, but may have already been collected or can still be collected in individual municipalities.

The reason for doing this is that the individual SDGs or the sub-goals and intermediate goals that are generally relevant for German municipalities should be mapped with indicators that are as informative as possible.

If individual SDGs or relevant municipal task areas are not yet comprehensively mapped by readily available data, then we will accept this as our mission for further room for improvement.

In any case, it is important to emphasise that this SDG Indicator Catalogue constitutes a proposal or a recommendation only. Each municipal can, should and must decide for itself, based on the specific framework conditions and priorities at the local level, which indicators are relevant to management and best suited to reflecting its respective contribution to the SDGs. Our modular system allows indicators to be omitted, changed or added at any time.

Compared to the second edition, this publication contains a partially updated set of indicators for depicting the SDGs in German municipalities. The current version of the SDG Indicators requires constant updating and adaptation to new findings from the sphere of theory and practice – in particular, by means of improved provision of relevant data from central statistical, scientific or other reliable sources.

We would like to thank all municipalities and experts who have contributed to this publication and hope that the Indicator Catalogue, as a practical tool, will continue to play a pivotal role in implementing the SDGs in German municipalities and thus to sustainable development as a whole.

1.2 SDG Indicators at a glance

The SDG Indicators can be divided into two groups. On the one hand, indicators have been defined that are qualitatively well suited and readily available across the board (Type I indicators). On the other hand, SDG Indicators have been selected that are qualitatively (very) well suited but not yet readily available (Type II indicators). A complete overview of Type I and Type II indicators can be found in sub-chapter 4.1.

Further characteristics of the SDG Type I and II indicators have been compiled in an MS Access-based database. The database is available for download on Bertelsmann Stiftung's project page (https://www.bertelsmann-stiftung.de/de/unsere-projekte/agenda-2030-nachhaltige-entwicklung-vor-ort/projektnachrichten/sdg-indikatoren-fuer-kommunen-dritte-auflage) The database can be used to compile individually designed indicators.

1.3 The SDG Portal at a glance

The SDG Portal (www.sdg-portal.de) offers a concise overview of Type I SDG Indicators and available data to all cities and municipalities with more than 5,000 inhabitants and to all districts in Germany. In addition to current data, short and medium-term time comparisons are also presented on the Portal. Furthermore, it also enables comparisons with other municipalities and average values. The various comparisons offer municipal sustainability officers, decision-makers in administration and politics as well as other local key players the opportunity to take stock of the SDGs, identify areas where action is needed and take appropriate measures.

Beyond the data provided, the Portal also offers ideas and suggestions for possible SDG measures – the aim is not only to show local players where there is a need for action, but also to help them introduce the most effective measures possible to implement the global sustainability goals.

Moreover, the SDG Portal provides tools for standardised and customisable reports.

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Key points of the “SDG Indicators for Municipalities” project

Henrik Riedel / Oliver Haubner / Marc Wolinda, Bertelsmann Stiftung

2.1 Starting position

In 2015, the United Nations adopted Sustainable Development Goals (SDGs) as part of the 2030 Agenda. Accordingly, the Federal Government systematically aligned itself with the SDGs in 2017 in its ongoing development of the German Sustainability Strategy (previously called the “National Sustainability Strategy”). In addition, sustainability strategies have also been developed or refined at federal state level, which are at least partially aligned with the SDGs. Ultimately, a growing number of German municipalities are working on sustainability concepts with the aim of playing their part in implementing the global sustainability goals.

The United Nations have published proposals for indicators to help map the status of sustainable development in terms of the SDGs. In addition, an SDG Indicator Catalogue has also been developed for the European Union. The Indicator Catalogues of the United Nations and the European Union are to be used as a basis for monitoring SDG implementation at national, regional and local level. When using the international Indicator Catalogues, however, it must be taken into account that not all 17 SDGs and 169 sub-goals and intermediate goals are of equal relevance in all countries and at all levels, and that reliable and comparable data from central sources are not available for all indicators.

In spring 2017, the project to develop suitable SDG Indicators for Municipalities in Germany was discussed in the joint ministerial working group “Sustainable Urban Development from a National and International Perspective” (IMA Stadt). In response, the working group “SDG Indicators for Municipalities” was founded. The founding members of this working group currently include the Bertelsmann Stiftung, the Federal Institute for Research on Building, Urban Affairs and Spatial Development, the German County Association, the Association of German Cities, the German Association of Cities and Municipalities, the German Institute of Urban Affairs, the ICLEI European Secretariat, the German section of the Council of European Municipalities and Regions. Following the publication of the first Indicator Catalogue in spring 2018, the SDG Indicators were tested, evaluated and refined. At the end of 2020, a completely revised version of the Indicator Catalogue was finally published. This publication contains a further revision of the SDG Indicators for Municipalities.

Excursus: “United Nations’ 2030 Agenda”

Sabine Drees, Association of German Cities

United Nations’ 2030 Agenda

The United Nations (UN) Sustainable Development Goals (SDGs) and the monitoring of developments by means of indicators provide a framework for action for German municipalities. In its 2018 resolution, the Executive Committee of the Association of German Cities (DST) also reaffirmed its support for the international Sustainable Development Goals (SDGs) recommending that member cities implement indicator-based monitoring.

The Executive Committee also noted that the “SDG Indicators for Municipalities” project provides a good basis for this. In 2020, the Association of German Cities Executive Committee also recommended the 2030 Agenda as a suitable reference for comprehensive sustainability management, including priority setting, controlling and reporting.

The 2030 Agenda as a reference framework for municipal action strategies

There are many different instruments for sustainability management, adapted to the needs of the respective individual municipality. They may include action strategies, indicator or sustainability reports, sustainability audits, energy and environmental management, sustainable procurement and, in larger municipalities, the introduction of integrated sustainability management. Citizen participation processes also play an important role. Cities, municipalities and districts are already implementing the goals of the 2030 Agenda at the municipal level. The model resolution “2030 – Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level” of the Association of German Cities and the Council of European Municipalities and Regions (CEMR) has now been signed by around 200 member municipalities. This demonstrates how the municipalities are willing to pursue municipal strategies for sustainability management, deepen global partnerships, participate in measures to combat the negative impacts of climate change or to create better access to affordable sustainable energy – to name just a few examples.

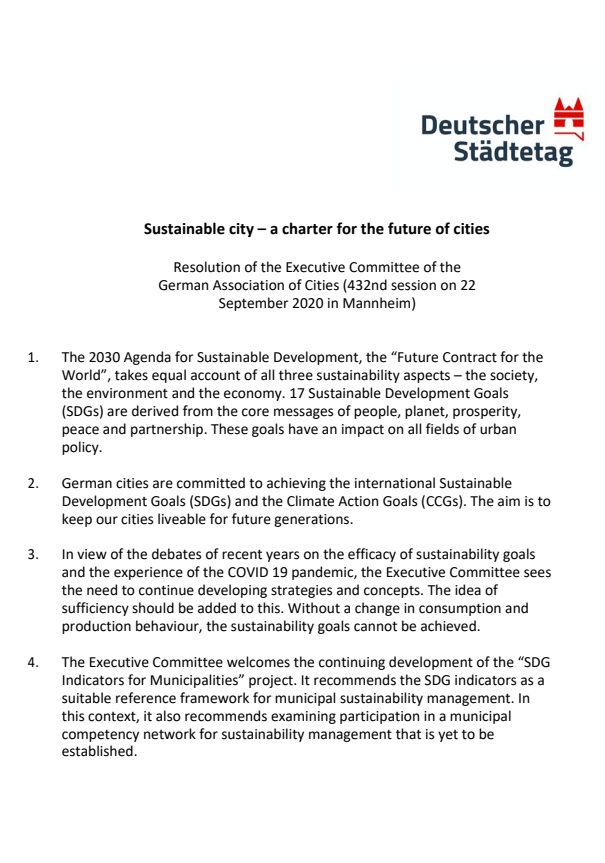
The SDGs as a reference framework for municipal sustainability reporting

The “The Club of the 2030 Agenda municipalities”, the model municipalities of the project “Globally Sustainable Municipalities” of the Service Agency Communities in One World (SKEW) of Engagement Global and the municipalities participating in Bertelsmann Stiftung’s “Monitor Sustainable Municipality” project and in the follow-up project “Agenda 2030 – Sustainable Local Development” as well as experts from the “Environment” and “Building and Transport” DST expert committees have contributed to the “SDG Indicators for Municipalities” project.

Beyond the indicators, municipalities have the opportunity to establish a sustainability management system that is qualitatively aligned with the SDGs and may comprise the following modules: sustainability strategies, measures, corresponding structural and financial resources as well as monitoring and reporting. Cross-level monitoring enables coordinated action by the federal government, the federal states and the municipalities and serves as a common guide. Indicators can help to shed light on developments on the ground. Through the systematic collection of quantitative and qualitative data based on pre-agreed indicators, actual conditions and changes can be identified, which form the basis for ensuring coherent interaction between all levels. If it is determined that child poverty has increased in a city, these findings are the starting point for research into causes and measures to improve the situation of children. This is beneficial for both municipalities and the state, which are jointly responsible for setting up and implementing funding programmes. From the municipal perspective, it is important that no standardised reporting format is specified with priorities being set centrally rather than by the municipalities.

International cooperation

The easy handling and appealing visualisation of the SDG Portal (www.sdg-portal.de) were also crucial for the SDG Action Award, which the United Nations presented for exemplary implementation of the global Sustainable Development Goals (SDGs). The SDG Portal was nominated in the “Best Visualisation” category and was one of three finalists at the award ceremony in Bonn on 2 May 2019.



Deutscher Städtetag

Sustainable city – a charter for the future of cities

Resolution of the Executive Committee of the German Association of Cities (432nd session on 22 September 2020 in Mannheim)

1. The 2030 Agenda for Sustainable Development, the “Future Contract for the World”, takes equal account of all three sustainability aspects – the society, the environment and the economy. 17 Sustainable Development Goals (SDGs) are derived from the core messages of people, planet, prosperity, peace and partnership. These goals have an impact on all fields of urban policy.

2. German cities are committed to achieving the international Sustainable Development Goals (SDGs) and the Climate Action Goals (CCGs). The aim is to keep our cities liveable for future generations.

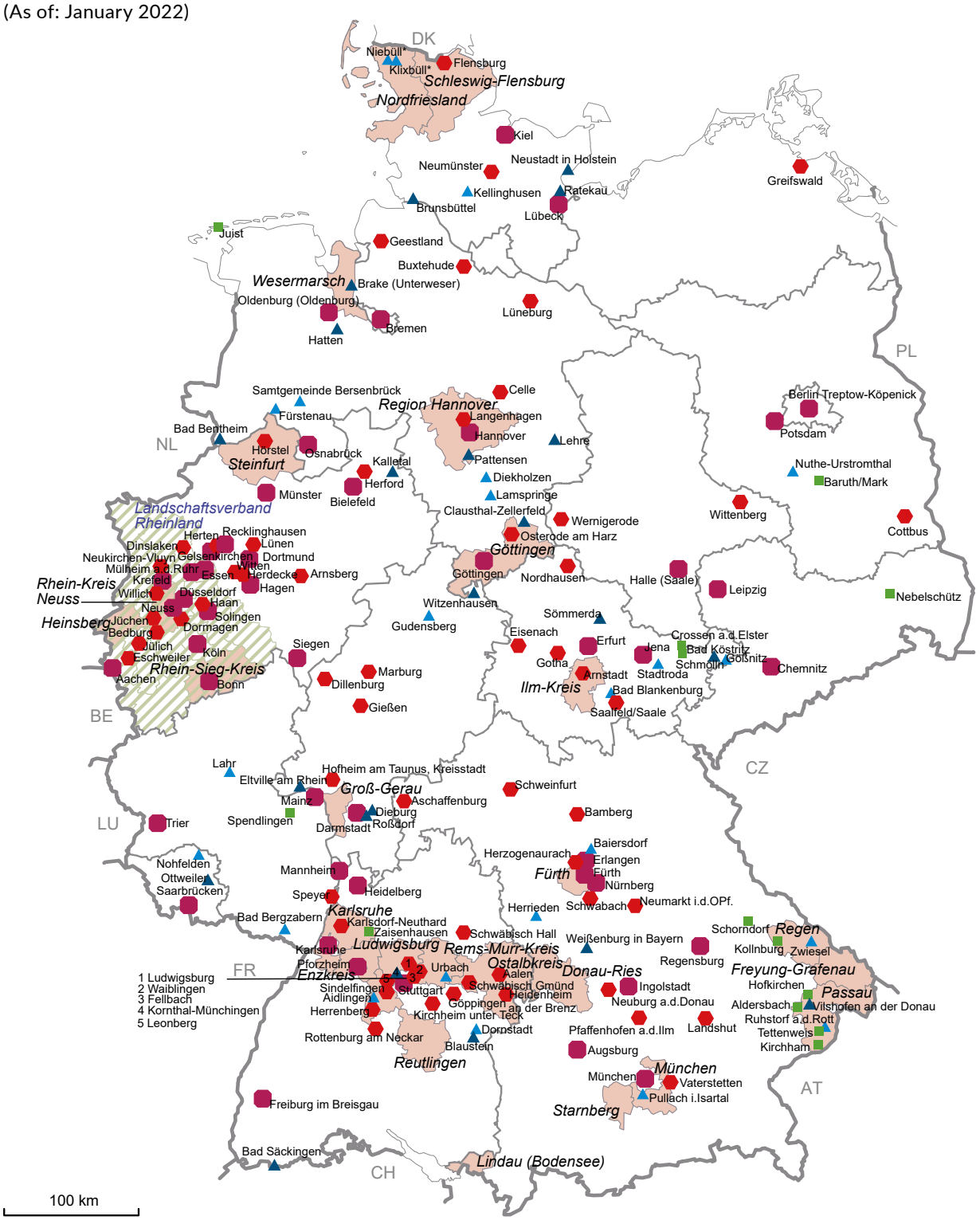
3. In view of the debates of recent years on the efficacy of sustainability goals and the experience of the COVID 19 pandemic, the Executive Committee sees the need to continue developing strategies and concepts. The idea of sufficiency should be added to this. Without a change in consumption and production behaviour, the sustainability goals cannot be achieved.

4. The Executive Committee welcomes the continuing development of the “SDG Indicators for Municipalities” project. It recommends the SDG indicators as a suitable reference framework for municipal sustainability management. In this context, it also recommends examining participation in a municipal competency network for sustainability management that is yet to be established.

Fig. Resolution of the Executive Committee of the German Association of Cities (translated from the German)

Signatory municipalities of the model resolution “2030 Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level” of the Association of German Cities and the Council of European Municipalities and Regions / German Section

(As of: January 2022)



Classification by BBSR city and municipality type	Anzahl
Large city (100,000 plus inhabitants)	47
Medium-sized town (20,000 to under 100,000 inhabitants)	62
Major small town (10,000 to under 20,000 inhabitants)	22
Minor small town (5,000 to under 10,000 inhabitants)	23
Rural municipality	13
County	27
Municipal Association	1

*Niebüll and Klixbüll are municipalities of Amt Südtondern, which is classified as a small town.

Database: Engagement Global gGmbH – Service Agency Communities in One World (SKEW), Ongoing spatial monitoring of the BBSR
Geometric basis:
Municipalities and districts (generalised), 31 December 2019 © GeoBasis-DE/BKG
editing: A. Milbert

2.2 Objectives

The aim of the “SDG Indicators for Municipalities” project is to identify suitable indicators for mapping SDG implementation at the municipal level in Germany and to provide corresponding data.

The identification of suitable indicators includes the collection, evaluation and selection of indicators for the sub-goals and partial goals of the SDGs that are generally relevant at the municipal level in Germany. Ultimately, the aim is to provide a set of indicators for mapping the SDGs at the municipal level in Germany that is as relevant for control and guided action as it is clear and manageable. In principle, the project will draw on indicators from existing catalogues; only in exceptional cases will new indicators be developed if no suitable indicators are available for relevant sub-goals and partial goals in the researched sources.

The data are provided – as far as possible – for all cities and municipalities with more than 5,000 inhabitants and for all districts, although the indicators can generally also be applied to smaller cities and municipalities. Wherever possible, official statistics are used to obtain the data; however, data from other central sources may also be used. The Bertelsmann Stiftung’s Wegweiser Kommune platform (www.wegweiser-kommune.de) is used to provide the data. In addition, the Bertelsmann Stiftung has set up the SDG Portal (www.sdg-portal.de) for municipalities in coordination with the partner organisations.

In addition, the SDG Indicators have been incorporated into the INKAR data portal of the Federal Institute for Research on Building, Urban Affairs and Spatial Development (www.inkar.de).

The SDG Indicator Catalogue should primarily contain indicators that are qualitatively well suited and readily available for data (Type I indicators). However, it is also possible that qualitatively (very) well-suited indicators will be included in an extended catalogue for which no data are currently available from central sources (Type II indicators). Consequently, the corresponding data cannot be provided at present and would have to be collected by the municipalities themselves. Designating Type II indicators is also intended to identify needs for the further development of official statistics or other statistics, e.g. from research institutes.

In any case, the SDG Indicator Catalogue has a proposal character about it: each municipal decides for itself which indicators it would like to use to map local SDG implementation against the background of local framework conditions and on the basis of strategic priorities. It is therefore conceivable and possible that the proposed SDG Indicators are changed, deleted or supplemented locally. Overall, the SDG Indicator Catalogue for the individual cities, districts and municipalities assumes the role of a modular toolkit. In general, the use of the indicators should contribute to making sustainability management in the individual municipality as impact-oriented as possible in terms of implementing the SDGs.

Excursus: “Overview of other international processes in sustainable development”

Alexander Kramer, German Association of Towns and Municipalities

The 2030 Agenda with its United Nations Sustainable Development Goals (SDGs) and the review of SDG implementation by means of indicators provide a framework for action for German cities, districts and municipalities (see excursus: “The United Nations’ 2030 Agenda”). Cities, counties and municipalities play a central role in implementing the 2030 Agenda. All three dimensions of sustainability and all 17 of the United Nations’ Sustainable Development Goals have a municipal relevance – from reducing poverty through integrated urban and regional development to municipal partnerships at national and international level. The goal of a sustainable society can only be achieved through a society-wide approach. Being the political and administrative level closest to the citizens, cities, districts and municipalities are already demonstrating in many ways how sustainable development can be shaped in close cooperation with civil society.

The New Urban Agenda from Quito

IIn October 2016, the international community came one step closer to the vision of a more sustainable global world. The third UN World Conference on Housing and Sustainable Urban Development (HABITAT III) ended in Quito, Ecuador, with the adoption of the New Urban Agenda. This New Urban Agenda, endorsed by the UN General Assembly, is intended to reaffirm the global commitment to sustainable urban development with the participation of all relevant key players. In particular, it takes into account the attainment of Urban Goal 11 to make cities and people’s neighbourhoods inclusive, safe, resilient and sustainable, also in view of an ever-increasing urban population. Since then, the first National Progress Report on the implementation of the New Urban Agenda has been prepared (www.bbsr.bund.de). It contributes to the Global Progress Report from the perspective of Germany. Among other things, the topics of climate protection, mobility in an urban-rural context and digitalisation are examined on the basis of indicators.

UN Climate Conference/Conference of the Parties (COP)

Progressive global warming requires, above all, a sustainable climate protection policy. In the Paris Climate Agreement of 2015, all 196 parties to the UN Framework Convention on Climate Change (195 states and the European Union) committed to limiting global warming to well

below 2 degrees, if possible, to 1.5 degrees, compared to the level before the start of industrialisation. At the 26th World Climate Conference, which took place in Glasgow at the end of 2021, the states pledged more clearly than ever before to limit global warming to a maximum of 1.5 degrees compared to the pre-industrial age. In the Glasgow Climate Pact, the states are also called upon to improve their climate targets by the year 2030. Furthermore, the national climate targets are to be reviewed as early as by the end of 2022 – and not only in 2025. According to the Glasgow resolutions, greenhouse gas emissions are to be reduced by 45 per cent by 2030 compared to 2010. Against the backdrop of the increasingly frequent and obvious consequences of climate change in the form of heat waves, storms and floods, the question remains as to whether the agreements reached will be effective and timely enough to combat climate change.

Leipzig Charter on Sustainable European Cities

In 2007, the ministers responsible for urban development in all EU member states adopted the Leipzig Charter on Sustainable European Cities. The Leipzig Charter is the central document on integrated urban development in Europe and its key points are still relevant today. Among other aspects, the Charter calls for the promotion of integrated approaches to urban development and more political focus on deprived urban neighbourhoods, and has already yielded significant results. The framework conditions for European cities and municipalities have changed since 2007. Young people around the world are campaigning for more climate protection and calling on politicians to act. Focusing on socially acceptable housing and land policies in large cities and new demands in the field of mobility have prompted the need to adapt the

Charter to current developments. In this context, the Leipzig Charter was updated in the second half of 2020 as part of a dialogue process at German and European level. The “New Leipzig Charter” is a guiding document for public welfare-oriented urban development in Europe. It is geared towards the three key dimensions of action for a just, green and productive city, as well as digital transformation as a cross-cutting factor. In addition to addressing the common good, an integrated approach, participation and co-production, multi-level cooperation and a place-based approach are identified as key principles of sustainable and future-oriented urban development. The continuation of the Leipzig Charter extends to the spatial levels of the neighbourhood, the city as a whole and the urban area.

Sendai Framework for Disaster Risk Reduction 2015–2030

At the World Conference on Disaster Risk Reduction held in Sendai, Japan, in March 2015, United Nations’ member states agreed on a new framework for mitigating natural disasters: the Sendai Framework for Disaster Risk Reduction 2015–2030. Given the increasing impact of disasters and their complexity in many parts of the world, the UN member states expressed their determination to scale up efforts to bolster disaster risk reduction in order to minimise the loss of life and assets due to disasters around the world. Furthermore, they aim to improve the protection of the world against the risk of disasters in the coming decades for the benefit of present and future generations. The Federal Republic of Germany has committed itself to implementing the Framework. The Federal Office of Civil Protection and Disaster Assistance (BBK) accordingly established the National Focal Point for the Federal Republic of Germany in April 2017 on behalf of the Federal Ministry of the Interior (BMI), the Federal Foreign Office (AA) and the Federal Ministry for Economic Cooperation and Development (BMZ) to steer the implementation processes of the Sendai Framework for Disaster Risk Reduction in Germany.

2.3 Methodology

The previous methodological approach for developing and providing SDG Indicators for Municipalities can be roughly divided into three phases. A detailed description of these phases can be found in chapter 3.

Phase I: Relevance check of the SDGs (chapter 3.2)

The relevance check is based on the consideration that German municipalities (also) play an important role in implementing the SDGs – not only in the case of SDG 11, which refers specifically to the role of cities, but in principle for all SDGs. However, the aim of the “SDG Indicators for Municipalities” project is to develop a clear and practicable set of indicators. For this reason, focus was placed on those sub-goals and individual statements within them (partial goals) that address significant problems or challenges at the municipal level in Germany.

More specifically, the relevance check is divided into three steps. In the first step, the sub-goals were subdivided into individual statements (partial goals), if necessary, to facilitate a relevance check for German municipalities that is as careful and comprehensible as possible. In the second step, consideration was given to whether the respective sub- or partial goal addresses a major problem for German municipalities (problem check). In the third step, it was examined whether a contribution can be made to achieving the sub- or partial goal in question with the help of municipal tasks (task check). A supplementary relevance check was then carried out for the area of municipal development policy. Only the sub- or partial goals that can be assessed as relevant to the problem and task were investigated further in the following phases.

Phase II: Evaluation and description of the SDG Indicators (chapter 3.3)

The indicators were also identified in three steps. In the first step, selected sustainability Indicator Catalogues were used to assign the indicators they contain to the sub- or partial goals classified as relevant. In addition to existing indicators, indicators that are not included in any of the sustainability Indicator Catalogues were also taken into account and assigned to the sub-goals and intermediate goals classified as relevant. For this purpose, detailed research into available indicators and raw data were carried out in various databases (e.g. Regional Database Germany, INKAR database of the BBSR and Bertelsmann Stiftung’s Wegweiser Kommune). In order to assess the quality of the collected indicators better, all indicators were evaluated according to four criteria (validity, data availability, data quality and function) in a second step. These criteria were later updated and supplemented by the “comprehensibility” factor. Based on the evaluations, Type I and II indicators were identified that are particularly suitable for municipal SDG monitoring (see above). In the third step, (core) indicators of Type I or II were selected for the SDG Indicator Catalogue. The selection was based on content-related questions, e.g. to determine if the indicator can be used to map the entire SDG and, if applicable, other SDGs as well. The development and refinement of the Indicator Catalogue was also guided by overarching principles, which are presented in detail in chapter 3.

For the selected Type I and II indicators, detailed descriptions were then created based on various characteristics. All indicator-specific information has now been compiled in a database using Microsoft® Access®.

Phase III: Collection and analysis of the indicator values (chapter 3.4)

For the selected Type I indicators, data were collected and analysed in the following. The data collection covered, as far as possible, all cities and municipalities with more than 5,000 inhabitants and all districts. In some cases, however, the data could only be collected for the districts and the independent cities, but not for the cities and municipalities belonging to the districts. Where possible, the data were gathered from 2006 onwards.

In order to gain a better understanding of the interrelations of the Type I indicators, correlation analyses were carried out.

The findings of the “SDG Indicators for Municipalities” project are provided in this publication and online. This publication describes the key points of the project, the methodological approach and the profiles of the selected SDG Indicators. Bertelsmann Stiftung’s “Agenda 2030 – Sustainable Local Development” project website (www.agenda2030vorort.de) provides this publication as a PDF and a database with all the information on the SDG Indicators on the basis of MS Access. The data on the Type I indicators can be downloaded from Bertelsmann Stiftung’s Wegweiser Kommune portal (www.wegweiser-kommune.de) and the SDG Portal (www.sdg-portal.de). In addition, data concerning the Type I indicators can be accessed via the INKAR Portal (www.inkar.de) of the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR).

Excursus: “Municipal SDG indicators in the INKAR portal of the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR)”

Antonia Milbert / Dr. André Müller, Federal Institute for Research on Building, Urban Affairs and Spatial Development

As of the reporting year 2017, Type I SDG Indicators have also been made available in the BBSR INKAR Portal (indicators and maps for spatial and urban development; www.inkar.de). In the Wegweiser Kommune, the individual municipality is the central reporting unit. Various municipalities can be added here for comparison at the user’s discretion. The INKAR Portal, on the other hand, is designed primarily to provide nationwide tables, thus ensuring an overview of all municipalities. This allows data to be output in tables and visualised as a map using an embedded cartographic tool. A nationwide view is offered, but the focus can also be placed on one or more federal states or regions.

The publication of the SDG Indicators in INKAR is therefore somewhat different than in the Wegweiser Kommune because of the INKAR-specific standards:

- INKAR offers the most comprehensive and detailed regional statistical information base in Germany, which draws on a wide range of topics. All information is available in a comprehensive format for the whole of Germany. SDG Indicators are only published in INKAR if data are also available for the whole country. There is no reference to Type II SDG Indicators.

- The indicators not only refer to administrative spatial references such as municipalities, districts and federal states, but also to relevant comparative categories (e.g. urban-rural, west-east, settlement types, city and municipality types) and other widespread regional categories, such as districts of the chambers of industry and commerce (IHK) or labour market regions.

- For reasons of nationwide comparability, the smallest observation unit is therefore not the municipality, but the municipal association. In comparison to the Wegweiser Kommune, data-related information is also provided for unitary municipalities and associations of municipalities in the size category below 5,000 inhabitants.

- The statistical parameters are largely calculated for time periods, i.e. municipalities and districts are mapped by their current boundaries; reporting does not exclude reformed municipalities and districts. As with all other subject areas, the timelines start with the earliest possible observation year, in some cases as early as 1995.

- Its flexible access allows any thematic, spatial and temporal compilation of the information and its export in common output formats. The SDG Indicators can thus be combined and reprocessed with further background information, depending on the level of interest and intended use.

- The entire INKAR database is available free of charge for and can be used for any purpose.

INKAR is intuitive to use. Users can call up regional data in a few steps and generate topical maps to determine how their own living environment compares regionally. The array of topics complementing the SDGs is broad, ranging from population structure, economic strength, public finances and social services to work, education, housing, transport, accessibility and land use. There are also animated maps that show developments in fast motion.

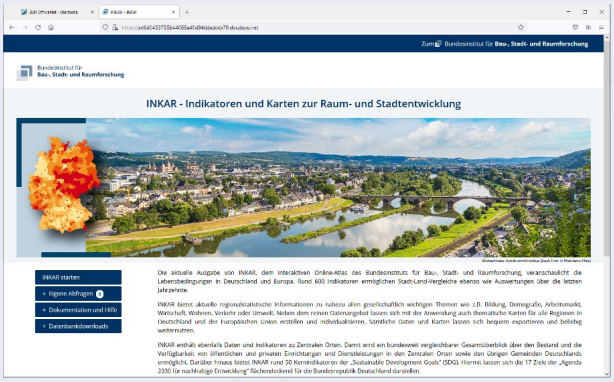


Fig. INKAR online

2.4 Organisation

A working group and discussion events were set up to organise the “SDG Indicators for Municipalities” project. In addition, the interim results were discussed in the Advisory Committee of Bertelsmann Stiftung’s “Monitor Nachhaltige Kommune” (Monitor Sustainable Municipality) project and the follow-up project “Agenda 2030 – Sustainable Local Development”.

The addressees and tasks of the individual committees and formats are briefly outlined below:

Working group

The working group “SDG Indicators for Municipalities” was founded in spring 2017 by the Association of German Cities. The working group meetings, chaired by the Association of German Cities, are attended by representatives of the partner organisations involved in the project.

The Association of German Cities, the German County Association and the German Association of Towns and Municipalities supervise the project work, involve experts from the member municipalities in the discussion processes and advocate for the application of the SDG Indicators in their respective member municipalities. The Council of European Municipalities and Regions / German Section and the ICLEI European Secretariat also support the use of the indicators at the municipal level. On behalf of the Bertelsmann Stiftung, the German Institute of Urban Affairs develops the SDG Indicators, conducts scientific analyses and provides coaching for municipalities. Bertelsmann Stiftung is responsible for the overall organisation of the project, the publication of the project results, the provision of data via the portals www.wegweiser-kommune.de and www.sdg-portal.de as well as accompanying handouts for municipal sustainability management. The Federal Institute for Research on Building, Urban Affairs and Spatial Development is involved in the development and ongoing optimisation of the indicators and provides data via the portal at www.inkar.de.

Until spring 2021, Engagement Global with its Service Agency Communities in One World also gave content-related support to the project work and provided financial support with funds from the Federal Ministry for Economic Cooperation and Development (BMZ). Representatives of the Service Agency Communities in One World, the German Council for Sustainable Development, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the Ministry for the Environment, Agriculture, Nature Conservation and Consumer Protection of the State of North Rhine-Westphalia are regularly invited as guests to the working group’s meetings and informed about the progress of the project.

Organised discussion events

These discussion events are aimed at municipalities that have signed the model resolution of the German Association of Cities and the Council of European Municipalities and Regions / German Section on the 2030 Agenda for Sustainable Development; the model municipalities of the country-specific “Globally Sustainable Municipalities” projects of Engagement Global; the cities and districts participating in Bertelsmann Stiftung’s “Monitor Sustainable Municipality” project and the follow-up project “Agenda 2030 – Sustainable Local Development”. In addition, representatives of the members of the “SDG Indicators for Municipalities” working group and other experts take part in the organised discussions.

The discussion events are prepared, organised and followed up by the Bertelsmann Stiftung. The interim results of the working group are presented for discussion at these events. The feedback from the participants is taken on board during the subsequent revision of the project results by the German Institute of Urban Affairs and the working group. The revised documents are then submitted to the Project Advisory Board.

Project Advisory Board

The Project Advisory Board includes representatives of the cities and districts involved in the Bertelsmann Stiftung project (currently: the City of Arnsberg, the City of Freiburg im Breisgau, the City of Eltville am Rhein, the City of Geestland, the City of Münster, the state capital Stuttgart, and the districts of Cochem-Zell and Lippe), representatives of the municipal associations, the German Institute of Urban Affairs, the Federal Institute for Research on Building, Urban Affairs and Spatial Development, the Service Agency Communities in One World of Engagement Global, the German Council for Sustainable Development, the Landesarbeitsgemeinschaft Agenda 21 NRW e.V. (North Rhine-Westphalia’s sustainability working group LAG Agenda 21 NRW), the ICLEI European Secretariat, and other experts.

The Project Advisory Board provides feedback on the findings of the discussion meetings. The feedback is taken into account by the German Institute of Urban Affairs and the “SDG Indicators for Municipalities” working group when finalising the results of their work.

Excursus: "The European Green Deal and its Implementation at Municipal Level"

Stefan Kuhn, ICLEI European Secretariat

The EU's Green Deal

The European Green Deal presented by the European Commission at the end of 2019, is Europe's response to the challenges posed by the implementation of the United Nations' Sustainable Development Goals (SDGs) and the Paris Climate Agreement. The goal is to make Europe the first climate-neutral continent on earth by 2050. In order to implement this vision as an integrated, interconnected concept, a whole framework of laws, strategies and packages of measures is being developed step by step, with the aim of enabling the systemic transformation of Europe. This includes a wide range of different domains, such as energy supply, transport, agriculture, buildings, nature and biodiversity or production and consumption. At the same time, however, it is to be ensured that this transformation process does not create social imbalances.

For the municipal level, and especially for those municipalities that have embarked on the local implementation of the SDGs and the Paris climate goals in recent years, such an integrated and complex approach to transformation is familiar terrain. Locally-led sustainability processes and integrated sustainability strategies tend to cover roughly the same range of issues and dovetailing challenges that characterise the European Green Deal. Accordingly, the municipal response to the EU's new overall strategy, already formulated in autumn 2020, was a logical conclusion.

Local Green Deals: the Mannheim Message

In the Mannheim Message, adopted at the European Conference of Sustainable Cities and Towns in Mannheim in October 2020, municipalities offer the EU and Member States their support in implementing the European Green Deal through Local Green Deals. These are to be built on the following five fundamental systemic changes:

- Transformation of our current local infrastructure and systems
- Local development beyond growth and competition
- Cooperation, solidarity and integration
- A lifestyle and culture of austerity and optimisation
- Reorientation towards the common good

The Mannheim Message, initiated by ICLEI together with the City of Mannheim and supported by the German EU Presidency, the European Committee of the

Regions, the European Investment Bank, the European Economic and Social Committee and other organisations, now has over 240 supporters and is also campaigning for the following policy changes:

- Secured public income
- Shifting taxes away from the labour force
- Local and regional value chains
- Integrated land use
- New use of urban space
- Demand-driven research and innovation
- Replacing products with services
- Guaranteed living wage

Climate City Contracts: EU Mission: "100 Climate-Neutral and Smart Cities by 2030"

With its Mission: 100 climate-neutral and smart cities by 2030, the European Commission has created a tool for implementing the European Green Deal that is aimed exclusively at municipalities. With the help of so-called City Climate Contracts, local governments, together with local stakeholders and regional and national institutions, are to implement measures agreed in writing that are designed to massively accelerate a local transformation towards climate neutrality and sustainability. They are supported by technical and financial advice, monitoring, exchange and training opportunities, the provision of tools and the financing of pilot projects.

SDG Indicators as a monitoring tool

Regardless of which path a municipality takes to move towards climate neutrality and sustainability – be it a municipal sustainability strategy, a local SDG balance sheet, a Local Green Deal or a Climate City Contract – all approaches have one thing in common: they all require a smart and comprehensive use of indicators and data in order to verify which successes and failures manifest on this challenging path.

The SDG Indicators are helpful for any form of local sustainability strategy, as they can be flexibly used, selected and supplemented according to the modular principle. Initial experience in advising individual municipalities on the development of a locally suitable strategy and an associated monitoring system has shown that the prioritised goals and key measures in each case require different indicators and metrics, which can usually be covered with a mix of data provided by the SDG Portal and supplemented locally.

2.5 Time schedule

Development

Das Vorhaben „SDG-Indikatoren für Kommunen“ begann im Frühjahr 2017. Ein Jahr später wurden der erste Indikatorenkatalog veröffentlicht und erste Daten im Portal „Wegweiser Kommune“ eingestellt. Ende 2018 wurden die Daten zudem im SDG-Portal für Kommunen zur Verfügung gestellt.

Trial

The SDG Indicators were trialled both with and without external support. External support for testing was provided in Baden-Württemberg’s state capital Stuttgart, in the Saarpfalz county (model municipality in the “Global Sustainable Municipalities in Saarland” (GNK)” project) and in individual model municipalities in Bertelsmann Stiftung’s “Monitor Sustainable Municipality” project and the follow-up project “Agenda 2030 – Sustainable Local Development”.

The aim of the trial in the state capital Stuttgart was to carry out a quantitative survey on the basis of the SDG Indicators. The project was carried out in cooperation with the Service Agency Communities in One World of Engagement Global. The German Institute of Urban Affairs was commissioned to provide operational support. The findings of the project can be viewed here (German only): https://www.bertelsmann-stiftung.de/de/publikationen/publikation/did/lebenswertes-stuttgart-die-globale-agenda-2030-auf-lokaler-ebene.

The “Global Sustainable Municipalities in Saarland” project of the Service Agency Communities in One World of Engagement Global was carried out in cooperation with the Institute for Applied Material Flow Management (IfaS) at the Environmental Campus Birkenfeld. Within the framework of the project, 13 municipalities were advised on the implementation of the 2030 Agenda. In addition, a quantitative survey was carried out with the Saarpfalz county on the basis of the SDG Indicators. This project was supervised by the IfaS on behalf of the Bertelsmann Stiftung. The results of this trial can be found here (German only): https://www.bertelsmann-stiftung.de/de/publikationen/publikation/did/lebenswerter-saarpfalz-kreis-die-globale-agenda-2030-auf-lokaler-ebene-1.

In the model municipalities of the project “Monitor Sustainable Municipality” and the follow-up project “Agenda 2030 – Sustainable Local Development”, the application of the SDG Indicators was supported by the ICLEI European Secretariat and the North Rhine-Westphalia’s sustainability working group LAG Agenda 21 NRW.

In some cases, the SDG Indicators were also field-tested independently, e.g. in municipalities that had signed the model resolution of the Association of German Cities and the Council of European Municipalities and Regions / German Section.

Evaluation

The experiences gained from the trial were collected, evaluated and used for ongoing development. A qualitative study was conducted in a small number of municipalities by the German Institute of Urban Affairs on behalf of the Bertelsmann Stiftung. The qualitative study looked at two municipalities from each of the following three groups: municipalities that had used the SDG Indicators with external support, municipalities that had used the SDG Indicators without external support, and municipalities that were committed to the SDG goals but had not yet worked with the “SDG Indicators for Municipalities” tool. In these municipalities, interviews were mainly conducted with the respective sustainability officers, focussing on experiences with the mapping of “sustainability” – especially the quantitative mapping, experiences with the SDG Indicators for Municipalities, strengths and weaknesses of the indicators as well as other constraints to their use.

Based on the evaluation results, the focal points for developing the SDG Indicator Catalogue were defined at the beginning of 2019.

Further development

The working group defined six key topics for the development of the SDG Indicator Catalogue:

- Vertical integration of indicators
- Indicators for climate and energy
- Indicators for urban, municipal and district development
- Indicators for other individual themes
- Indicators based on public data
- Indicators for municipal development policy

The first five key topics were worked on by the German Institute of Urban Affairs. A separate project was set up with the aim of elaborating the development policy indicators. This project was undertaken by the Bertelsmann Stiftung in cooperation with and partly funded by Engagement Global with its Service Agency Communities in One World, with the support of the Kommunale Gemeinschaftsstelle (municipal joint office) and in collaboration with model municipalities. The updated SDG Indicator Catalogue was published at the end of 2020.

Update

The current update of the SDG Indicators for Municipalities focused on the identification of Type I indicators for SDG 13 “Climate action” (in connection with Type I indicators for SDG 7 “Affordable and clean energy”) as well as Type I indicators for SDG 17 “Partnerships for the goals”. Furthermore, numerous individual indicators have been optimised. Finally, all indicators have been re-evaluated on the basis of partly modified or supplemented criteria.

No.	Committee/format	Topic	Location	Date
1	Working group meeting	Relevance check of the SDGs	Cologne	07/06/2017
2	Discussion event	Relevance check of the SDGs	Hannover	26/06/2017
3	Project Advisory Board meeting	Relevance check of the SDGs	Berlin	30/06/2017
4	Working group meeting	Identification of indicators	Cologne	21/09/2017
5	Discussion event	Identification of indicators	Hannover	10/10/2017
6	Project Advisory Board meeting	Identification of indicators	Berlin	07/11/2017
7	Working group meeting	Description of the indicators and data collection	Cologne	30/01/2018
8	Working group meeting	Discussion of the publication manuscript	Cologne	25/04/2018
9	Project Advisory Board meeting	Discussion of the publication manuscript	Berlin	19/09/2018
10	Working group meeting	Discussion of the final version of the publication	Cologne	20/10/2018
11	Project Advisory Board meeting	Discussion of the final version of the publication	Berlin	07/11/2018
12	Working group meeting	Evaluation results	Cologne	14/03/2019
13	Project Advisory Board meeting	Interim results of development	Berlin	17/06/2019
14	Working group meeting	Discussion of the first version of new indicators	Cologne	18/08/2019
15	Discussion event	Discussion of the first version of new indicators	Hannover	01/10/2019
16	Project Advisory Board meeting	Discussion of the first version of new indicators	Berlin	22/10/2019
17	Working group meeting	Discussion of the second version of new indicators (part 1)	Cologne	04/12/2019
18	Working group meeting	Discussion of the second version of new indicators (part 2)	Cologne	15/01/2020
19	Working group meeting	Discussion of the third version of new indicators	Online	26/05/2020
20	Working group meeting	Discussion of the final version of new indicators	Online	26/08/2020
21	Project Advisory Board meeting	Presentation of the final version of new indicators	Online	06/10/2020
22	Working group meeting	Discussion of the further development of the SDG Portal	Online	29/01/2021
23	Working group meeting	Discussion of the further development of the SDG Portal	Online	12/05/2021
24	Working group meeting	Planning the update of indicators	Online	21/06/2021
25	Project Advisory Board meeting	Discussion of the further development of the SDG Portal	Online	23/06/2021
26	Working group meeting	Discussion of the first version of new indicators	Online	29/09/2021
27	Project Advisory Board meeting	Discussion of the further development of the SDG Portal	Online	09/11/2021
28	Discussion event	Discussion of the second version of new indicators	Online	10/11/2021
29	Working group meeting	Discussion of the third version of new indicators	Online	08/12/2021
30	Working group meeting	Discussion of the final version of new indicators	Online	29/03/2022
31	Project Advisory Board meeting	Presentation of the final version of new indicators	Online	31/03/2022

Table: Previous project work milestones

Excursus: "The significance of the municipalities for Germany's Sustainable Development Strategy"

Miriam Elsaeßer, German County Association

Sustainable development can only be achieved with the support of municipalities. The Catalogue of SDG Indicators for Municipalities clearly shows that this applies not only to Sustainable Development Goal 11 "Sustainable cities and communities", but to all 17 goals: from key Indicator 1 for the SGB II/XII rate, to Indicators 13, 14 and 15 on basic healthcare provision available locally, to Indicator 118 on the number of development policy projects, where cities, districts and municipalities make a crucial contribution to sustainable development in Germany.

Nevertheless, the German Sustainability Development Strategy (DNS) unfortunately pays little attention to municipalities. In the 2018 update, the role of the municipalities was even referred to only sporadically in the context of lighthouse projects, the "involvement of players from society as a whole" or "federal-state cooperation". It is a welcome development that cooperation with the municipal level in an ongoing development of the DNS 2021 has its very own sub-chapter, and that the SDG Indicators for Municipalities project is singled out in particular. This puts them at least on par with the federal states and civil society representatives – but their position, otherwise portrayed as rather prominent, is still not given due emphasis.

The international comparison shows that there is another way: In a survey by Platforma, the European association for municipal development cooperation, 58% of the participating municipal associations stated that they had been included in the national sustainability reporting in 2019. Unfortunately, this is not the case in Germany, as there is no comparable, systematic consideration and involvement of municipalities. However, small steps in the right direction are coming to light: in Germany's Voluntary National Review (VNR) to the High-level Political Forum on Sustainable Development (HLPF), which was published in 2021, a contribution was included from the municipal umbrella organisations with reference to the SDG Indicators.

However, this positive tendency to pay more attention to German municipalities' existing commitment to sustainable development is not yet reflected in the selection of key indicators by which sustainable development in Germany is to be measured according to the SDS. Many indicators that are available at the municipal level and could be easily incorporated into the SDS are not utilised. As a result, the contribution of municipalities to sustainable development is insufficiently represented. Although the DNS emphasises that cities, districts and municipalities are key players in sustainable development, it provides only limited assistance when it comes to recording the contribution of municipalities to achieving the Sustainable Development Goals.

The indicators for SDG 3 "Health and well-being" stand out, for instance, as they show the basic provision of general practioners, hospitals and pharmacies locally (indicators 13 to 15 of the SDG Indicators for Municipalities) as well as places and staff in nursing homes and care services (Indicators 16 to 18). Especially in the current pandemic situation, it shows that the goal of "ensuring a healthy life for all people of all ages and promoting their well-being" cannot be measured by premature mortality and smoking and obesity rates alone, but depends to a large extent on the care provided at the local level. The fact that this existing data are not included in the SDS leads to a truncated representation of sustainable development in Germany.

This also applies to SDG 4 "Quality education": basic provision of primary schools locally (Indicator 20) would be a useful addition in this case to capture one aspect of quality education in Germany. The adoption of the indicator on the number of inclusive child day care facilities (Indicator 27) would also take into account the aspect of inclusion. This is not covered by any DNS key indicators.

SDG 11 "Sustainable cities and communities" explicitly refers to municipal issues. The goal is to make settlements inclusive, safe, resilient and sustainable. In this context, supplementing the SDS with indicators on the basic availability of supermarkets locally (Indicator 58) and the provision of green spaces locally (Indicator 69) would be desirable, as these along with other indicators represent the immediate quality of life of people in Germany.

This list could be added to for many other SDGs. There are, of course, differing opinions on the question of which indicators are most relevant for depicting Germany's sustainable development. However, it should have become obvious by now that a complete picture of Germany's sustainable situation cannot be made without a comprehensive appraisal of the municipal level.

3

Methodology for developing SDG Indicators for Municipalities

Oliver Peters, German Institute of Urban Affairs (Difu) –
in cooperation with Henrik Riedel, Bertelsmann Stiftung

3.1 Objectives and principles of the SDG Indicator Catalogue

The primary goal of the "SDG Indicators for Municipalities" project is to develop suitable indicators for mapping the 17 SDGs at the municipal level in Germany. To this end, indicators are identified, in some cases redefined, and corresponding data are compiled to provide indicator values at municipal level to the extent possible. The Indicator Catalogue is intended to serve as an instrument for impact-oriented municipal sustainability management. Being of a recommendatory or modular nature, it allows individual municipalities to decide for themselves which indicators they want to use locally and to what extent they want to change, supplement or otherwise interpret them. Depending on the objective of the municipality, it may make sense to use the Indicator Catalogue in its entirety (e.g. in the case of a comprehensive review of the state of sustainable development) or to select certain indicators (e.g. in the case of strategy development or monitoring the success of certain measures). If the latter is the goal, however, we recommend keeping in mind that, according to the preamble of the 2030 Agenda, the SDGs should be perceived as indivisible and, as far as possible, considered and assessed in their entirety. This is important in order to do justice to the multiple interdependencies between different intermediate goals within an SDG or between SDGs. In other words, it is only when the systemic interrelationships and consequences (known as goal congruencies and goal conflicts) of measures are considered that the impact of a strategy or measure on municipal sustainable development can be meaningfully evaluated.

When it was founded in 2017, the "SDG Indicators for Municipalities" working group set itself the goal of developing a Catalogue of SDG Indicators that is as much of a directive as it is practicable. In addition to control relevance and manageability, the development of the SDG Indicator Catalogue is based on eight principles that are to be observed as a result and across individual project phases and editions of this brochure:

Acceptance
The Indicator Catalogue should be widely acceptable by providing recommendations for individual indicators (as a modular system) in order to take the individual structural characteristics of municipalities into account.

Completeness
The Indicator Catalogue should be as complete as possible, i.e. it should contain key figures and indicator values for all relevant sub-goals and intermediate goals.

Manageability
The Indicator Catalogue should be manageable, i.e. it should contain no more indicators than there are relevant sub-goals and intermediate goals.

Compatibility
The Indicator Catalogue should be compatible with other catalogues by using existing indicators as far as possible (especially from higher levels).

Stability
The Indicator Catalogue should remain stable, i.e. the indicators are largely valid in the long term so that comparisons over time are possible.

Current relevance
The Indicator Catalogue should be as up to date as possible, in that the selection of indicators corresponds to the current state of science and practice.

Control relevance
The Indicator Catalogue should be control-relevant, i.e. the Catalogue provides a good basis for the design of sustainability reports, strategies, budgets and audits.

Participation
The Indicator Catalogue should be developed in a participatory manner, i.e. it should be discussed with representatives from municipalities and other stakeholders.

These principles show the high-quality standards that are inherent in the SDG Indicator Catalogue and which, in the spirit of SDG 17, can only be achieved in cooperation with all relevant key players. Accordingly, there are two main reasons for disclosing these principles: on the one hand, they are intended to ensure that the basic deliberations on the design of the Indicator Catalogue are transparent to all. On the other hand, the principles for the Catalogue are intended to emphasise that the selection of individual indicators always involves consideration processes to fulfil the individual principles in the most balanced way possible.

In order to efficiently achieve the overarching goal of developing a municipal SDG Indicator Catalogue, the development of indicators is based on a relevance check of the 169 SDG sub-goals for German municipalities. This relevance check was carried out in three steps to identify those SDG sub-goals or partial statements within these sub-goals (partial goals) assumed to be of particular relevance for German municipalities. For this purpose, a highly participatory procedure was chosen, which was revised in several steps and by different committees (see Assmann, Honold, Grabow & Roose 2018 and Knipperts 2020).

The design of the relevance check and its results will be examined in more detail in the following sub-chapter. First of all, however, it should be pointed out that a negative relevance check result for a sub-goal or partial goal certainly does not mean that this goal cannot still be relevant for individual municipalities and their individual objectives and set of challenges. It is therefore the responsibility of each individual municipality to check for itself which further sub-goals and partial goals it would like to include in its individual sustainability monitoring.

3.2 SDG relevance check as a basis for indicator development

3.2.1 Basic considerations for the relevance check

(also) have a central role to play in the implementation of the 2030 Agenda and thus in solving a wide range of global problems and challenges. German municipalities should therefore not only focus their municipal action on SDG 11 and other selected goals, but should also participate in the implementation of all 17 SDGs and (almost) all sub-goals (e.g. see Engagement Global 2016; UCLG 2015) – be it through actions “In the municipality for the municipality”, “In the municipality for the world” or “In other countries by other countries” (cf. distinction within the framework of the project “Global Sustainable Community”; Federal State Working Group Agenda 21 NRW e.V./Engagement Global 2018).

Nevertheless, an Indicator Catalogue that fully reflects the content of all 169 sub-goals (and would presumably have to consist of indicators in the higher three-digit or even four-digit range) would go beyond the remit – not just for the “SDG Indicators for Municipalities” working group, but especially for municipalities that would like to use the Catalogue to take a comprehensive, but manageable and realistically feasible stock-take of their sustainable development. This is why the focus of the SDG Indicators for Municipalities is on those sub-goals and partial goals that address significant problems and challenges in German municipalities or in municipalities of the Global South and that can be solved or overcome by German municipalities – at least in part and, above all, measurably – by virtue of their own functional expertise.

A fundamental problem is posed by SDG sub-goals whose wording leaves room for interpretation, meaning that the result of the relevance check depends on how the respective goal is interpreted. In some cases, comparison with the original English wording was helpful, or, in case of doubt, the basic principles of people, planet, prosperity, peace and partnership formulated in the 2030 Agenda were taken as reference.

For example, it is not initially clear what is meant by the “modern energy services” referred to in SDG 7.1. In the least developed countries, for example, coal-fired power plants could also be interpreted as modern energy sources; however, these would contradict the basic principle of “planet”, which explicitly calls for the protection of the planet from damage and for action to combat climate change. In order to classify SDG 7.1 as a relevant sub-goal, “modern” was equated with clean and renewable.

The interpretation generally becomes apparent either when sub-goals were broken down into different partial goals, or it is evident from the type of indicators assigned. Overall, however, no "reinterpretations" or additions (e.g. for reasons of systematics or on the basis of certain scientific findings) were made to statements.

For example, the slums mentioned in SDG 11.1 were not equated with informal settlements (of a more voluntary nature) or socially critical neighbourhoods. Instead, the international definition of a slum was taken into account, with the result that this sub-goal was broken down into two partial statements. Similarly, desertification mentioned in 15.3.1 was not “translated” as soil degradation making this partial goal irrelevant for German municipalities: nonetheless, this is still applicable to municipalities in the Global South. The sub-goals that address non-municipal players or institutions were not redefined for municipalities either, even though municipalities could also play a part in achieving the goal by taking appropriate action (e.g. SDG 13.a “Provide finance to assist developing countries in climate change mitigation actions” does not address municipalities, but only the Parties to the UN Framework Convention on Climate Change). The only exception to this is SDG 13.2 (“Integrate climate change measures into national policies, strategies and planning”). Although the national level is explicitly addressed here, global climate protection goals can only be achieved if the municipal level also plays its part. Initially, no supplements were made by adding targets that could be useful or necessary as a means of implementing (municipal) development cooperation if this was not explicitly or implicitly addressed as a means of implementation – even if it was an area that could be the subject of municipal development cooperation (e.g. SDG 3.8.1 “Coverage of essential health services [...] among the general [...] population”).

3.2.2 Relevance check structure

3.2.2.1 Subdivision of the sub-goals (step 1)

First, the 169 sub-goals of the 17 SDGs were checked to see if they needed to be broken down into partial statements or goals to enable a consistent relevance check for German municipalities. This was necessary for some sub-goals, as components with distinct content may have to be assessed differently during the problem check or the task check.

Such a subdivision was made, for example, for SDG 11.1 ("By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums"). The relevance check for the first sub-goal "By 2030, ensure access for all to adequate, safe and affordable housing and basic services" (SDG 11.1.1) yielded a positive result, while the result of the relevance check for the second sub-goal "By 2030, [...] upgrade slums" (SDG 11.1.2) was negative, as there are no slums as such in Germany. Nevertheless, slums are considered a problem of the Global South and a task of municipal development policy, which is why the sub-goal was again rated as positive in a second relevance check (see chapter 3.2.2.4).

Result: in total, 43 of the 169 sub-goals were broken down into 94 partial goals according to this procedure, which means that in eight cases a sub-goal was even broken down into three partial goals. After the first step of the relevance check, 220 sub-goals and partial goals existed for the 17 SDGs, which were subjected to a problem check in the next step.

3.2.2.2 Problem check (step 2)

Based on the above-mentioned basic considerations, problems or challenges that impact a "significant" proportion of municipalities or relevant population groups in Germany were classified as being crucial for German municipalities – as a rule of thumb more than 10 per cent. This means, for example, that challenges for municipalities on the sea coast (or also in mountain regions) are excluded for the time being; unless other municipalities can also make a key contribution to the sub-goal. Marine protection and mountain ecosystem objectives should nevertheless be taken into account in national reporting. In exceptional cases, the problem check was also positive for sub-goals or partial statements that affect less than 10 per cent of certain population groups, but still represent a not inconsiderable social problem that has not yet been satisfactorily solved for municipalities – namely, in cases where there is political consensus on the need for action.

This applies, for example, to malnutrition (SDG 2.2), which is estimated to affect about 1.5 million people in Germany, especially in inpatient healthcare facilities (cf. e.g. Monitor *Versorgungsforschung* (healthcare research watchdog), 2017). Although this is less than 10 per cent of the population, a political consensus on the need for action can be assumed. Another example is illiteracy (SDG 4.6 "By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy"), an issue that affects more than seven million adults in Germany, at least to a limited extent (Federal Ministry of Education and Research, 2016).

There is also a need for action if the time scale envisaged in the goals for achieving the goals cannot necessarily be met, the extent of the envisaged improvement in the case of quantitative goals is not achievable in Germany or is not even considered desirable in some municipalities due to expected conflicts of goals.

For example, the global target (SDG 3.6) of halving the number of deaths and injuries from road traffic accidents worldwide by 2020 is not achievable in Germany due to its high safety standards compared to many other countries; however, German municipalities can still aim to reduce the number of deaths and injuries from road traffic accidents. Considerable afforestation (SDG 15.2.2) could lead to land shortages and conflicting goals with other areas of sustainable development in a number of German municipalities, while it would certainly make sense in some municipalities.

Result: the problem check was positive for 145 of the 220 or 65.9 per cent of the sub-goals and partial goals. For these sub-goals and partial goals, a task check was carried out in the third step.

3.2.2.3 Task check (step 3)

The check as to whether "a contribution to the achievement of the respective individual goal can be made with the help of municipal tasks or products" was only carried out if the result of the problem check was positive. In this case, the evaluation was based on a weighing process involving two specific sources and a subjective evaluation. The following sources served as a basis:

- The KGSt (German association for municipal management) product plan (as of June 2016): contrary to an initial proposal to focus only on the KGSt product plan this was found to be inadequate for the evaluation for several reasons. Firstly, it is not complete, as it often does not include outsourced tasks, for example; secondly, in some cases the products listed in it are worded too generally to allow a clear statement regarding the evaluation of a sub-goal; thirdly, it is not undisputed in practice or is not fully implemented, resulting in the development of other, separate product classifications in some places.

- The current product framework plans of the federal states: these plans are used for a product-oriented structuring of the municipal budgets in the respective federal state. The product framework plans of the federal states go into somewhat more detail than the KGSt product plan in the wording for the products listed in them.

Clarifying the legal framework for each sub-goal in full and thus examining the municipal and district ordinances of all the federal states was impossible with the given resources and available timeframe. Overall, a municipality can contribute to sustainable development not only but also by means of voluntary municipal tasks such as climate protection,

sustainable procurement, business promotion or education for sustainable development.

The rule for general decision-making was defined as follows: if German municipalities can make a direct contribution to achieving the respective individual statement with the help of municipal tasks or products (i.e. through their own local authority powers, political players or municipal companies; "major options for action") or if municipalities have opportunities to set corresponding framework conditions for implementation by other players ("medium options for action"), then this is a municipal task in the broader sense. Cases in which a municipality can only motivate other players to behave in a certain way that corresponds to the SDGs ("minor options for action") were not evaluated as a relevant task.

For example, SDG 11.1.1 ("By 2030, ensure access for all to adequate, safe and affordable housing and basic services") clearly falls within the (mandatory) remit of a municipality; the variety of housing policy instruments gives rise to a wide range of options for action. Medium options for action were seen, for example, in economic growth (SDG 8.1.1 "Sustain per capita economic growth in accordance with national circumstances"), for which favourable overall conditions can be set within the framework of municipal business development. On the other hand, the task check result for 16.10.2 ("[...] protect fundamental freedoms, in accordance with national legislation and international agreements") was negative, because although the protection of fundamental freedoms is part of municipal tasks, municipalities cannot sanction violations and thus cannot protect fundamental freedoms. An example of "minor options for action" that were not assessed as a municipal task is SDG 14.a ("Increase scientific knowledge, develop research capacities and

transfer marine technology, [...], in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries [...]"). While a municipality may be able to encourage local research companies to prioritise certain research, it can hardly exert its direct influence on certain framework conditions; this also applies to possible influence on research policy at the state or federal level.

For the task check, no consideration was given to whether the municipalities currently have the institutional, financial or human resources to deal with the tasks or if municipalities give higher priority to individual goals. In principle, improving the situation in the municipality helps to improve the situation at national and global level, even if the contribution to global improvement may not be measurable. For the task check, it was also important that municipal action to resolve a problem or a challenge is measurable on principle by means of indicators. This means that indirect, multiple impact chains of municipal action are not directly taken into account for the time being.

For example, although municipalities play a significant part in ocean acidification, especially through emissions (SDG 14.3 "Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels"), the individual municipal contribution is not directly verifiable and thus not subject to monitoring. On the other hand, the task check result for SDG 14.1 ("By 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution") was positive, as nutrient inputs into rivers on municipal territory can in principle at least be estimated.

Goals relating to illegal practices were generally not considered to be relevant to the tasks of municipalities, as they are the responsibility of the law enforcement agencies. In the event that there are failures by law enforcement agencies when it comes to prosecuting criminal offences and other illegal acts, it still makes no sense to assign this task to municipalities.

This applies, for example, to SDG 16.4.1 ("By 2030, significantly reduce illicit financial and arms flows") and SDG 8.8.2 ("[...] promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment").

The outcome of the task check depended exclusively on whether or not municipalities have opportunities to exert influence (in terms of major or medium options for action, see above), but not on how comprehensive these opportunities are. The task check result was also positive if municipalities are only addressed as employers and can thus only make a small overall contribution to achieving the goal.

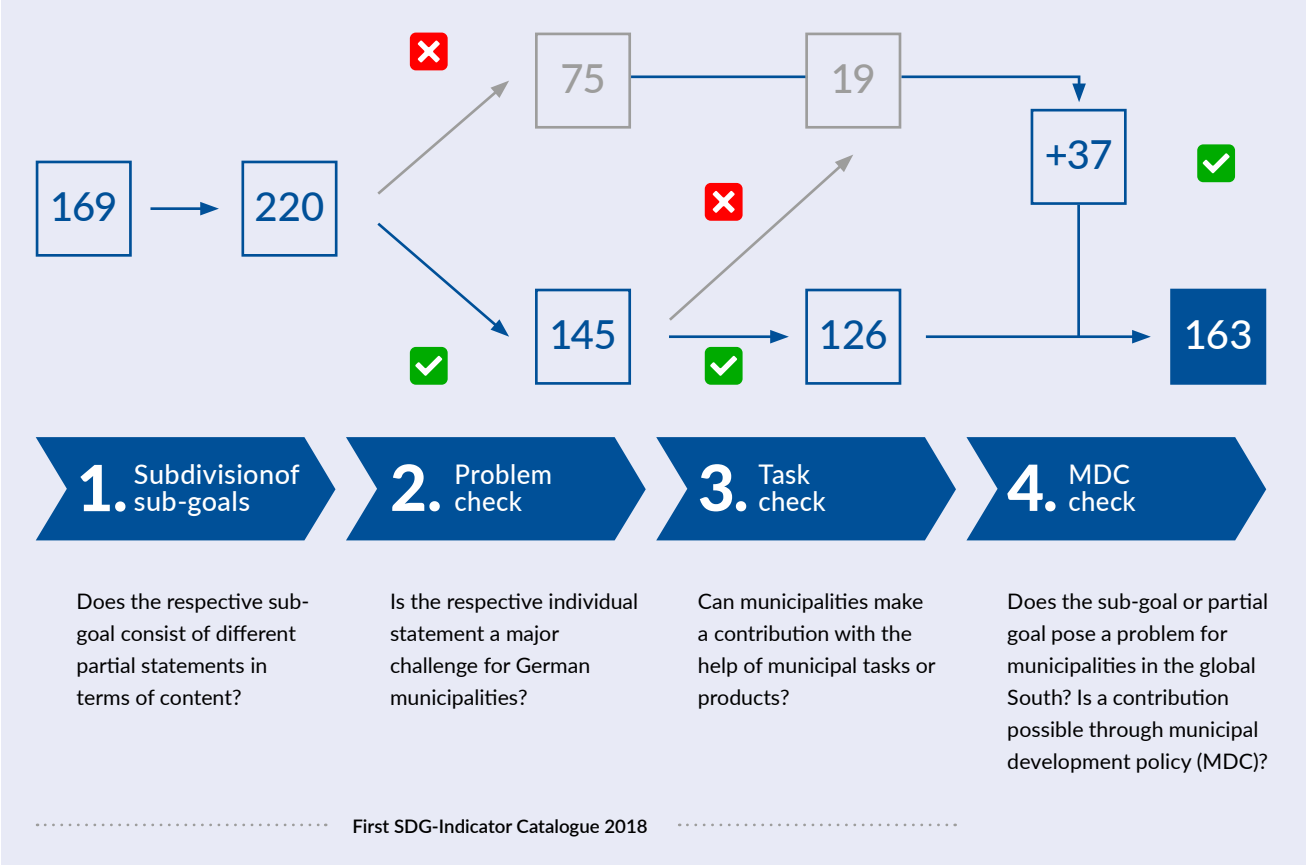
For example, municipalities can contribute to SDG 8.5 ("By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value") by ensuring fair pay scales for their employees.

Ultimately, small opportunities for exerting influence were not considered relevant if influence could only be exerted via municipal partners but decisions were made at a level other than that of the individual municipality.

avings banks (*Sparkassen*) do qualify as municipal partners for achieving SDG 8.3 ("Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services"). However, the criteria for decision-making on access to financial services are made at the level of at least the regional savings banks and giro associations, which means that an individual municipality has, at best, only limited options for action in this regard.

Result: the task check was carried out for the 145 sub-goals and partial goals that achieved a positive result in the problem check. The evaluation of the task check was negative in only 19 cases. Therefore, the relevance check was positive for 126 of the 220 or 57.3 per cent of the sub-goals and intermediate goals.

Relevance check



3.2.2.4 Relevance check for municipal development policy and overall result

Finally, the result of the relevance check was compared and combined with a second relevance check carried out during the *"SDG-Indikatoren für kommunale Entwicklungspolitik"* project (SDG Indicators for municipal development policy) (Knipperts 2020). The methodology for breaking down the sub-goals into partial goals was adopted so that the assessment was based on the same number of sub-goals and partial goals. The problem check was expanded to include the question "Does the sub-goal or partial goal pose a problem for municipalities in the Global South?" The task check was carried out in three stages: firstly, according to possible tasks of municipal development policy with an impact in other countries and by other countries; secondly, according to tasks with an impact in the municipality on the world; and thirdly, according to tasks with an impact in the municipality and on the municipality (for some sub-goals, there are tasks with impacts in several areas of influence on municipal development policy). A total of 156 of the sub-goals and partial goals, or 70.9 per cent, were classified as relevant for municipal development policy (Knipperts 2020), although these are not identical to the sub-goals and partial goals from the first relevance check and were only supplemented by problems and tasks relating to the Global South. Thus, seven sub-goals and partial goals were rated negatively in the second relevance check, but have been retained in this "SDG Indicators for Municipalities" project due to the positive rating from the first relevance check.

Overall result: the "SDG Indicators for Municipal Development Policy" project has classified a total of 30 sub-goals and partial goals as relevant in addition to the 126 sub-goals and partial goals from the first relevance check, which have been adopted here. In addition, there are seven sub-goals and partial goals that were only assessed as relevant in the first relevance check and are to be retained in the overall assessment. The final result of the combination of the two relevance checks is that 163 or 74.1 per cent of the sub-goals and partial goals were taken into account in the selection of SDG Indicators.

3.3 Evaluation and description of the SDG Indicators

For the purpose of providing the relevant sub-goals and partial goals with the best possible indicators, five basic quality criteria and associated minimum standards were defined. This created a decision-making framework for the research, collection and selection of indicators from existing sources and for our own development of new indicators, in turn to allow selection of the most suitable indicators for the working group's objectives. These five quality criteria are validity, comprehensibility, data availability, data quality and function (the quality criterion "comprehensibility" was added in the course of the present update of the SDG Indicators). For the definition of minimum standards in these criteria, they were basically divided into three different quality levels or evaluation options. The criteria, the statements to be evaluated and the evaluation options are explained in more detail below.

3.3.1 Validity

Validity indicates the suitability of an indicator for monitoring a specific issue mentioned in the respective SDG sub-goal or partial goal. Evaluation can refer to a facet of the corresponding sub-goal or partial goal (if available) and is not dependent on how completely an indicator reflects the content. Hence, validity is the most important necessary (but not yet sufficient) quality feature for a potential SDG Indicator and has been rated "x" (does not apply), "xx" (applicable with limitations) or "xxx" (fully applicable) with regard to a specific indicator. For the selection of indicators from existing sources referring to higher levels (e.g. expenditure made in relation to national GDP), the indicator has been "transposed" to the municipal level before evaluation in order to always assess validity from the municipal perspective (i.e. expenditure made at the municipal level in relation to value added at the municipal level).

In terms of validity, the minimum standard for an indicator depends on whether or not data can be provided for an indicator (see 3.3.3): If data are provided for an indicator (Type I Indicator),

limited validity ("xx") is sufficient; for indicators that must be collected by the municipalities themselves (Type II Indicators), an indicator must have been assessed as fully applicable ("xxx").

3.3.2 Comprehensibility

The comprehensibility criterion is about how plausible the validity of the indicator is. An indicator can be assessed as "plausible" if both the statement of the indicator itself and the reference to the respective sub-goal and partial goal are comprehensible.

The comprehensibility of an indicator is rated as "x" (does not apply), "xx" (applicable with limitations) or "xxx" (fully applicable).

As with "validity", the minimum standard for "comprehensibility" depends on whether data can be provided for the indicator or not. If data can be provided, a limited comprehensibility ("xx") is sufficient; if indicators have to be collected by the municipalities themselves, the indicator must be rated as fully comprehensible ("xxx").

3.3.3 Data availability

Data availability indicates whether or not the data required for an indicator for more than one municipality can be obtained from a central source or is centrally available.

Two further conditions are the regular collection of data in intervals of at least six years and their availability or preparation without major (manual) effort. Data availability was assessed on three levels: with "xxx" for indicators whose data are available from public authorities – from official statistics – (usually area-wide, at least at the district level); with "xx" for indicators whose data are available from scientific or other central institutions (if applicable, only for certain municipalities (types, regions and/or and size classes)); with "x" for indicators whose data are not available from central institutions (data should be obtainable in a municipality without major effort).

There is no minimum standard for indicators in terms of data availability. However, this determines the type of indicator: centrally available data (with availability rating "xx" or "xxx") correspond – if all other minimum standards are met – to a Type I Indicator, whereas data to be organised decentrally (rating "x") can only result in a Type II Indicator.

3.3.4 Data quality

The rating of data quality relates to the consistency of the data collection concept as a basis for the comparability of data from different municipalities. More specifically, it is about how accurately and reliably the data for the respective indicator is measured (reliability), how complete (without significant data gaps in individual measurement points or sub-measurements) or representative (for the municipality) it is, and whether it is significantly distorted by further measurement errors (e.g. the selection or application of the methodology or external factors).

Data quality was only evaluated if data availability was rated at least "xx". If this was not the case, no evaluation was made ("x-xxx"), as the rating of potential data quality in many areas is not possible without special expertise or is heavily dependent on individual implementation at the local level. If it was the case, however, the data quality with regard to a specific indicator was evaluated with "x" (does not apply), "xx" (applicable with limitations) or "xxx" (fully applicable).

The minimum standard for Type I indicators is data quality with limitations ("xx"), for Type II indicators there is no minimum standard set by the project. However, attention to the highest possible data quality in decentralised collection or compilation is strongly recommended.

3.3.5 Function

In addition to validity, comprehensibility, data quality and data availability, the function of the indicator was also assessed. Indicators can basically fulfil the following functions: input indicators are defined as those that provide information on the use of human, financial or material resources. Output

indicators refer to the results or products that are created or achieved with the help of an input. Outcome indicators measure the direct effects of the outputs on the target groups. Impact indicators focus on direct or indirect (overall) societal impacts in relation to the respective SDG or to other SDGs.

Within the framework of our evaluation, we initially only distinguished between output, outcome or impact indicators (rated with "OP/OC/IM") on the one hand and input indicators (rated with "IP") on the other. In other words,

Validity: statement for evaluation	
"The indicator accurately reflects the content of the sub-goal or partial goal (if any)."	
Evaluation options	
xxx	fully applicable
xx	applicable with limitations
x	not applicable

Comprehensibility: statement for evaluation	
"The validity of the indicator is easily plausible, i.e. both the statement of the indicator itself and the reference to the respective sub- goal or partial goal are comprehensible."	
Evaluation options	
xxx	fully applicable
xx	applicable with limitations
x	not applicable

Data availability: statement for evaluation	
"The required data are available centrally for more than one municipality. It is available without major (manual) effort and is collected regularly, i.e. at least every six years."	
Evaluation options	
xxx	Data available from public authorities – from official statistics (Usually area-wide, at least at district level)
xx	Data available from scientific or other central institutions (If applicable, only for certain municipalities (types, regions and/or size classes))
x	Data not available from central institutions (Data should be obtained in a municipality without major effort)
x	Data to be collected decentrally (municipality must conduct its own surveys)

Data quality: statement for evaluation	
"There is a uniform data collection concept in place that allows data from different municipalities to be compared. The data are measured accurately and reliably for the respective indicator (reliability). It is as complete as possible (without significant data gaps in individual measurement points or sub-measurements) or representative (for the municipality) and not significantly distorted by further measurement errors (e.g. due to the selection or application of the methodology or external factors)."	
Evaluation options	
xxx	fully applicable
xx	applicable with limitations
x	not applicable
x-xxx	no evaluation possible

Function: statement for evaluation	
"The respective indicator measures at least the direct results or products intended by specific measures that correspond to the respective SDG sub-goal or intermediate goal."	
Evaluation options	
Output/outcome/ impact indicator (OP/OC/IM)	The indicator refers to the results or products (outputs) or the effects (outcomes/impacts) of a resource use. The underlying sub-goal or partial goal refers to the outputs or outcomes/impacts.
Input/output indicator (IP/OP)	The indicator refers to a resource use. The underlying sub-goal or partial goal explicitly mentions a change in this use of resources as the desired result.
Input indicator (IP)	The indicator refers to a resource use. The underlying sub-goal or partial goal does not explicitly refer to a change in this resource use, however.

Minimum requirements of Type I and II Indicators		
	Type I Indicator	**Type II Indicator**
Validity	minimum "xx"	"xxx"
Comprehensibility	minimum "xx"	"xxx"
Data availability	minimum "xx"	no minimum requirement
Data quality	minimum "xx"	no evaluation
Function	"OP/OC/IM" or "IP/OP"	"OP/OC/IM" or "IP/OP"
Other requirements	-	no Type I Indicator

a distinction was only made as to whether an indicator measured the use of resources or at least the direct result of the use of resources, which also set the minimum standard. Indicators are not normally allowed to measure inputs.

For some indicators, no clear distinction could be made between input indicators ("IP") and output/outcome/impact indicators ("OP/OC/IM") on account of the definition of the underlying sub-goal and partial goal. This becomes clear in sub-goal 7.a.2 ("By 2030, [...] promote investment in energy infrastructure and clean energy technology"). An obvious indicator for mapping this target is the "municipal investments in the expansion of renewable energies". Basically, this indicator refers to a use of funds, i.e. an input. However, due to the wording of sub-goal 7.a.2, this resource input also describes the envisaged output. In such cases, the function of the indicator was evaluated as "IP/OP" to express that the indicator can be interpreted as an input or output indicator (or outcome or impact indicator) depending on the particular standpoint.

3.3.6 Description of SDG Indicators

For all SDG Indicators, detailed information is provided in the form of an MS Access-based database. The database can be downloaded from the Bertelsmann Stiftung's project page (https://www.bertelsmann-stiftung.de/de/unsere-projekte/agenda-2030-nachhaltige-entwicklung-vor-ort/). The database contains the following information for the indicators:

Designation:
How has the indicator been named in short or in keywords?

No.:
What (consecutive) number has the indicator been given within the framework of the Indicator Catalogue?

No. of the (primary) goal:
What number has been assigned to the goal to which the indicator has been primarily assigned within the framework of the 2030 Agenda?

Designation of the (primary) goal:
What designation has been assigned to the goal to which the indicator has been primarily assigned within the framework of the 2030 Agenda?

No. of the (primary) sub-goal:
What number has been assigned to the sub-goal to which the indicator has been primarily assigned within the framework of the 2030 Agenda?

Designation of the (primary) sub-goal:
What designation has been assigned to the sub-goal to which the indicator has been primarily assigned within the framework of the 2030 Agenda?

References to the sub-goals and partial goals:
To which other sub-goals and partial goals has the indicator been assigned?

Origin:
In which other Indicator Catalogue(s) can the indicator be found in the same or a similar form?

Definition:
How has the indicator been defined?

Calculation:
Which formula can be used to calculate the indicator?

Unit:
In which unit of measurement is the indicator measured?

Statement:
Which statement does the indicator support?

Sources (only for Type I Indicators):
From which source(s) is the individual basic data of the indicator obtained?

Data preparation (only for Type I Indicators):
Which body is responsible for the preparation of the indicator?

Data collection levels (only for Type I Indicators):
At which levels (counties and independent cities/cities or municipalities belonging to counties) is the indicator available?

Collection interval (only for Type I Indicators):
At what intervals (in years) are the indicators or the corresponding basic data collected?

Retrievable for ... (only for Type I Indicators):
Which years is the indicator available for?

Validity – evaluation:
How can the validity of the indicator be evaluated?

Validity – explanation:
How can the evaluation of the indicator validity be substantiated?

Comprehensibility – evaluation:
How can the comprehensibility of the indicator be evaluated?

Comprehensibility – explanation:
How can the evaluation of the indicator comprehensibility be substantiated?

Data availability – evaluation (only for Type I Indicators):
How can data availability for the indicator be evaluated?

Data availability – explanation (only for Type I Indicators):
How can the evaluation of data availability for the indicator be substantiated?

Data quality – evaluation (only for Type I Indicators):
How can data quality for the indicator be evaluated?

Data quality – explanation (only for Type I Indicators):
How can the evaluation of the indicator data quality be substantiated?

Function – evaluation:
How can the indicator function be evaluated?

Function – explanation:
How can the evaluation of the indicator function be substantiated?

Statistical correlations (only for Type I Indicators):
Is there a correlation with other SDG Indicators and, if so, how strong is the correlation and how could the correlation be substantiated?

General conditions (only for Type I Indicators):
Is there a correlation with municipal structural features and, if so, how strong is the correlation and how could the correlation be substantiated?

Interpretation:
How should the change in the indicator values over time be assessed in terms of sustainable development? (For example, are rising/falling values to be assessed as fundamentally sustainable?)

Type:
Which type does the indicator belong to (Type I or Type II)?

3.4 Collection and analysis of SDG Indicators

3.4.1 Collection of indicator values

For Type I Indicators, data were collected from official statistics and other central sources. Where possible, data were collected for cities and municipalities with more than 5,000 inhabitants and for districts and independent cities. Data were also collected even if they were only available at the district level but not at the municipality level.

At the time of the survey, Bertelsmann Stiftung's Wegweiser Kommune already provided data for numerous Type I Indicators, while other indicators were not yet available via this platform. The corresponding data records were usually obtained from the GENESIS database of the Federal and State Statistical Offices (regional statistics) or the INKAR database of the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR). In addition, data from the Institute for Resource Management at the University of Giessen and data from the IÖR Monitor from the Leibniz Institute for Ecological Urban and Regional Development were used to calculate the indicator values.

Since Bertelsmann Stiftung's Wegweiser Kommune provides data from 2006 onwards, the current survey period extends from 2006 to 2020. By the time of publication, however, the required data records were only available for some of the Type I Indicators. In these cases, the survey was only conducted up to the most recent reporting year.

As an example, data at the level of districts and independent cities for the year 2019 were used for the analyses. The year 2019 was chosen because it is the most recent year for which data were available for (almost) all Type I indicators at the time of the evaluation. For indicators for which values from 2019 were not available, the values from the next available year were used if possible.

3.4.2 Correlation analysis

A correlation analysis is the simplest way to get a first impression of the correlations between the indicators. A correlation matrix

usually shows in tabular form the linear relationship between indicators considered in pairs. The values of such a matrix are correlation coefficients. The value range of a correlation coefficient is between -1 and +1. Positive correlation coefficient values indicate that there is a positive linear relationship between the indicators. If the expression of one indicator increases, the other indicator also tends to take on a higher value. Negative values indicate a negative linear relationship between the indicators under consideration. In this case, higher values of one indicator tend to be associated with lower values of the other indicator. At the "extreme values" -1 and +1, the correlation coefficient indicates a "perfect" positive or negative linear relationship between the indicators. Such a "perfect" correlation exists, for example, for indicators that differ only in the unit of measurement used. If the correlation coefficient assumes the value 0, there is no linear relationship between the indicators under consideration.

Correlations do not describe a cause-effect relationship, i.e. no causal relationships between the indicators. In the case of a positive correlation coefficient, it is therefore by no means the case that the increase in one indicator is to be understood as the cause of the increase in the other indicator. In many cases, correlations are actually due to a third set of characteristics. Numerous examples are available to illustrate the difference between correlation and causality. An often-cited example is the correlation between the birth rate and the number of storks in a region. The reason for the positive correlation of the two variables can be traced back to the degree of industrialisation, as both storks and families tended to settle in rural areas for a long time. Any correlations found are therefore (only) a starting point for reflecting on the causes of the correlation between the indicators.

3.5 Origins of the SDG Indicator Catalogue

The development and selection process of the SDG Indicators for Municipalities took place in several project phases, which are briefly outlined below.

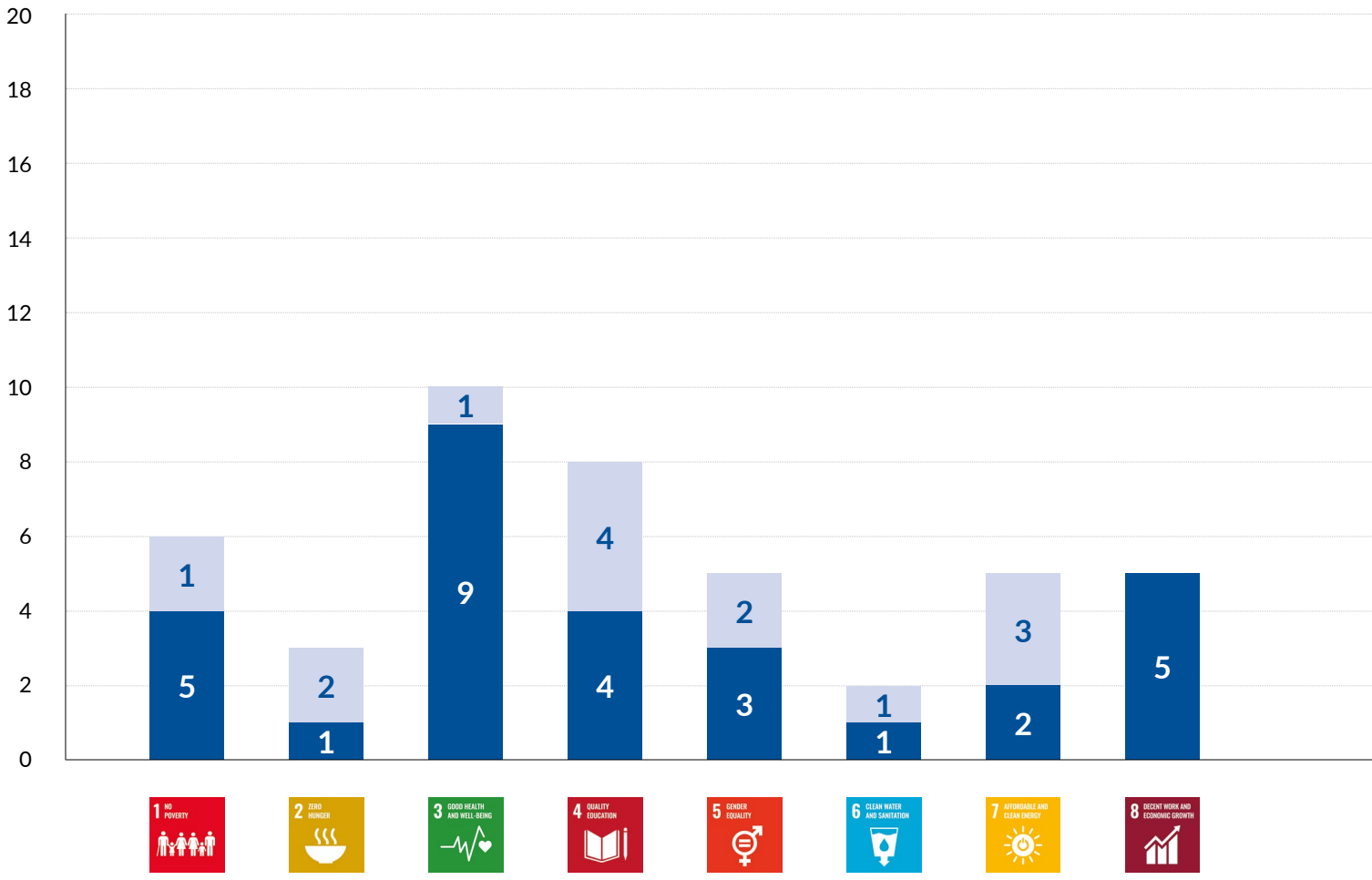
Based on the relevance check, indicators were identified in a comprehensive selection process covering all 17 SDGs from indicator sets at global, European and national level and, for example, based on two state level Indicator Catalogues and several collections of municipal sustainability indicators. This broad selection resulted in the first version of the SDG Indicator Catalogue with 47 indicators; for a detailed description of the methodological approach and the corresponding sources, please refer to the original publication (Assmann et al. 2018).

Subsequently, the SDG Indicators for 2019 were specifically developed in those thematic areas and for those aspects that were to be prioritised following an evaluation of the first SDG Indicator Catalogue. In an initial module, the catalogue was extended by adopting additional indicators from the German Sustainability Development Strategy (SDS).

In addition, indicators that were already included but differed slightly from the SDS in terms of content were adapted in individual cases to facilitate the vertical integration of sustainability reporting at the municipal and national level. To supplement this, indicators from the sustainability strategies of Baden-Württemberg and North Rhine-Westphalia were also adopted. In a second module, a review was carried out to determine which data from open sources or from research projects could be made available for existing Type II indicators – with the result that a small number of previous Type II indicators can now also be backed up with data. In a third module, the municipal development policy perspective was fundamentally revised and both the basic relevance check and the Indicator Catalogue itself were extended accordingly (Knipperts 2020). In further modules, selected topics were specifically addressed, as users of the first SDG Indicator Catalogue had prioritised improvements in these areas. These focal points were in the areas of urban and district development (especially housing, land management and mobility), climate protection, care and digitalisation.

In 2020, this was followed directly by a broader elaboration in various subject areas. On the one hand, additional indi-

SDG Indicators for Municipalities (3rd edition, 2022)



cators in very different SDG sub-goals were researched to enable specific indications from various project events in 2019 and 2020 to be followed up – for example, feedback from a discussion event with municipal representatives, from meetings of the Advisory Board for the "Monitor Sustainable Municipality" project and from inputs from the working group itself.

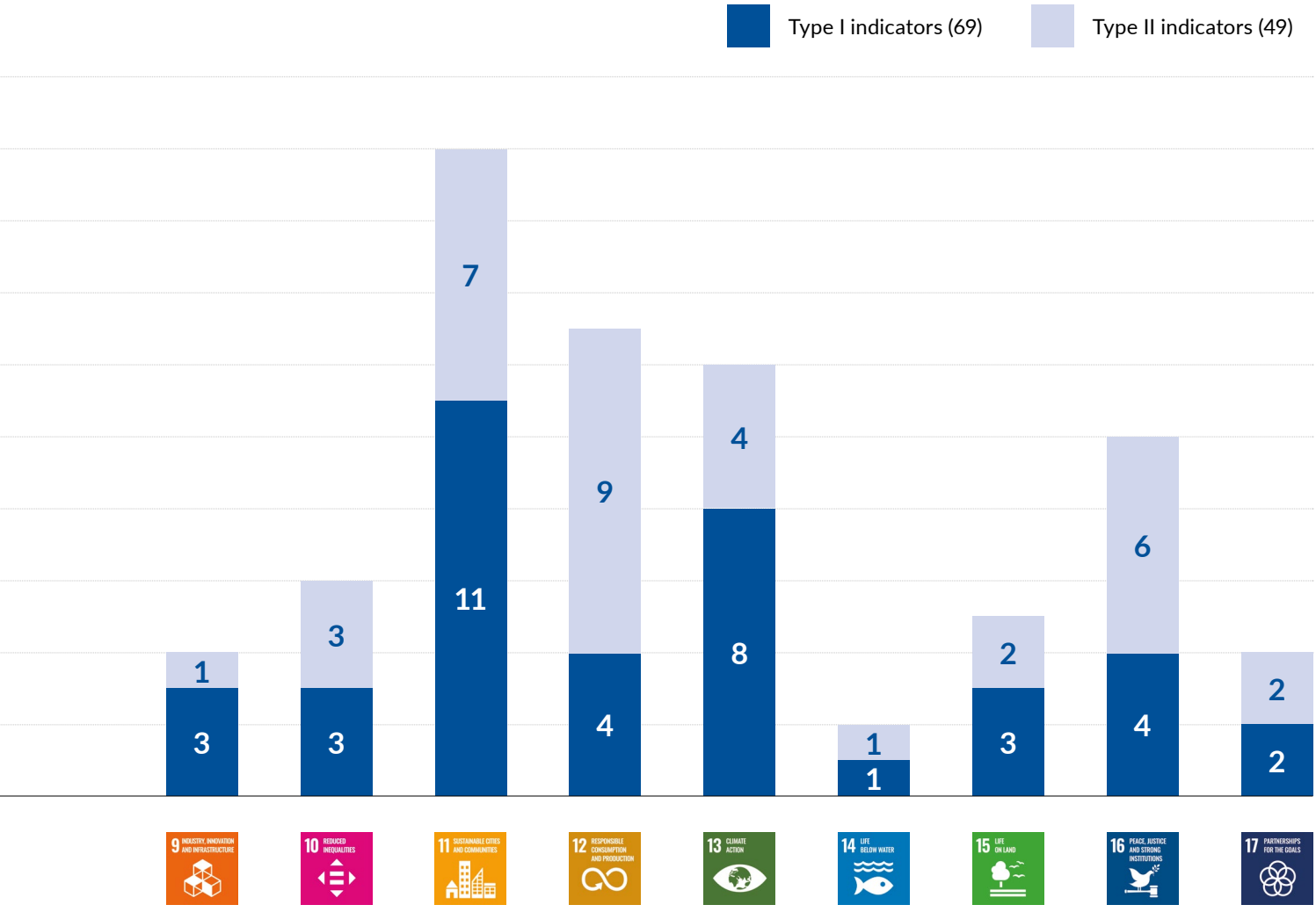
On the other hand, sources used in the first version of the Catalogue were reviewed for new information in 2020.

Furthermore, in addition to the included sources with existing indicators, entirely new Type II indicators were developed for the first time: five indices, which subsume a series of qualitative information on a specific field of action (yes/no questions) into a quantitative indicator through coding and summation – the Digitalisation Index, the Sustainable Procurement Index, the Corruption Prevention Index, the Climate Protection Index and the Climate Adaptation Index.

In addition, new Type II indicators were adopted, which arose from specific feedback from the municipalities and the research for the "Climate and Energy" Monitor Report 2020.

In 2021 and 2022, the Indicator Catalogue was updated again, focussing primarily on the SDGs for which no Type I indicators could be identified at that time: SDG 13 "Climate action" (in conjunction with SDG 7 "Climate and energy") and SDG 17 "Partnerships for the goals". An overview of the distribution of the current indicators among the SDGs and Types I and II can be found in the graph below.

Future areas of focus could include sustainable finance and subjective indicators, for example, where – despite extensive research – it has not yet been possible to define or collect satisfactory indicators. These and other areas in the scope of the SDGs reveal the continuing need for research into (municipal) sustainability indicators.



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Overviews of SDG Indicators for Municipalities

Oliver Peters, German Institute of Urban Affairs – in cooperation with Henrik Riedel, Bertelsmann Stiftung

SDG description		Indicator description		Indicator type
SDG no.	SDG designation	Indicator designation	Indicator definition	Type
1	No poverty	SGB II / SGB XII rate	Proportion of persons entitled to benefits under SGB II or SGB XII (under 65 years) in the total population (under 65 years)	Type I
		Poverty – child poverty	Proportion of under-15s affected by poverty in the total number of under-15s	Type I
		Poverty – youth poverty	Proportion of 15 to 17-year-olds affected by poverty in the total number of 15 to 17-year-olds	Type I
		Poverty – elderly poverty	Proportion of over 65s affected by poverty in the total number of over 65s	Type I
		Material deprivation	Proportion of materially deprived inhabitants in the total population	Type II
		Homelessness	Proportion of inhabitants who are considered accommodated homeless in the total population	Type I
2	Zero hunger	Children with malnutrition	Proportion of overweight and underweight children	Typ II
		of all children examined in their first year at school	Type II	Typ II
		Organic farming	Proportion of organically farmed land in the area used for agriculture	Type II
3	Good health and well-being	Premature mortality – women	Number of deaths among women aged under 70 per 1,000 inhabitants	Type I
		Premature mortality – men	Number of deaths among men aged under 70 per 1,000 inhabitants	Type I
		Noise pollution	Proportion of inhabitants in residential areas exposed to traffic noise in the total population	Type II
		Basic supply close to home – general practitioner	Average linear distance in metres per inhabitant to the nearest general practitioner	Type I
		Basic supply close to home – hospital	Average car travel time in minutes per inhabitant to the nearest primary care hospital	Type I
		Basic supply close to home – pharmacy	Average linear distance in metres per inhabitant to the nearest pharmacy	Type I
		Staff in nursing homes	Staff in nursing homes per 1,000 inpatients in need of care	Type I
		Staff in nursing services	Staff in nursing services per person in need of care	Type I
		Nursing home places	Number of available inpatient places in nursing homes per 1,000 inhabitants aged 65 and over	Type I
		Air pollution	Annual mean value of fine dust pollution in µg PM_{10} per m^3	Type I

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4	Quality education	Basic supply close to home – primary school	Population-weighted linear distance in metres to the nearest primary school	Type I
		School drop-out rate	Proportion of school leavers without a lower secondary school leaving certificate (Hauptschulabschluss) among all school leavers	Type I
		Child care (under 3s)	Proportion of children under 3 cared for in child day-care facilities among all children under 3 years of age	Type I
		Child care staff (under 3s)	Number of children under 3 years of age per childcare worker in day-care facilities	Type II
		30 to 34-year-olds with tertiary or post-secondary non-tertiary education	Proportion of 30 to 34-year-olds with tertiary or post-secondary non-tertiary education in total population	Type II
		Sustainable schools	Proportion of schools in the municipality that have received a sustainability certificate among all schools in the municipality	Type II
		Sustainable child day-care facilities	Proportion of child day-care facilities in the municipality that have received a sustainability certificate among all child day-care facilities in the municipality	Type II
		Inclusive child day-care facilities	Proportion of inclusive child day-care facilities in the municipality among all child day-care facilities in the municipality	Type I
5	Gender equality	Ratio of employment rates of women to men	Ratio of employment rate of women to employment rate of men	Type I
		Ratio of median income of women and men	Median income of female employees in relation to median income of male employees	Type I
		Proportion of women in the city council, municipal council or district council	Proportion of seats in the city council, municipal council or district council held by women, in relation to the number of all seats on the city council, municipal council or district council	Type I
		Proportion of women in leadership positions in city, municipal or district administration	Proportion of women in management positions in the city, municipal or district administration in relation to the number of all managers in the city, municipal or district administration	Type II
		Proportion of women in management positions in municipal enterprises	Proportion of women in management positions in municipal enterprises in relation to the number of all managers in municipal enterprises	Type II
6	Clean water and sanitation	Nitrate in groundwater	Proportion of monitoring sites where the threshold value of 50 mg nitrate per litre is exceeded at all measuring points	Type II
		Wastewater treatment	Proportion of wastewater treated by denitrification and phosphorus elimination in total wastewater	Type I
7	Affordable and clean energy	Proportion of renewable energy in gross energy consumption	Proportion of renewable energy in gross energy consumption	Typ II
		Electricity from renewable sources	Net installed capacity of renewable electricity from biomass, solar radiation, hydro and wind in kW per inhabitant	Typ I
		Energy-efficient street lighting	Proportion of street lighting with LED technology in total street lighting	Typ II
		Charging point infrastructure	Number of public normal and fast charging points from 3.7 kW per inhabitant	Typ I
		Expenditure for the municipal expansion of renewable energies	Proportion of municipal budget expenditure for investments in the expansion of renewable energies in the total expenditure	Typ II
8	Decent work and economic growth	Gross domestic product	Gross domestic product per inhabitant	Type I
		Long-term unemployment rate	Proportion of long-term unemployed in the labour force	Type I
		Employment rate – 15 to 64-year-olds	Proportion of 15 to 64-year-olds in employment subject to social insurance at place of residence in relation to all 15 to 64-year-olds	Type I
		Employment rate – 55 to 64-year-olds	Proportion of 55 to 64-year-olds in employment subject to social insurance at place of residence in relation to all 55 to 64-year-olds	Type I
		Employed and receiving benefits (Aufstocker)	Proportion of employed people receiving supplementary unemployment benefit II (Arbeitslosengeld II) in relation to all people receiving benefits who are capable of working	Type I
9	Industry, innovation and infrastructure	Start-ups	Number of newly established commercial enterprises per 1,000 inhabitants	Type I
		Highly qualified	Proportion of employees subject to social security contributions with an academic vocational qualification among all employees subject to social security contributions in the workplace	Type I
		Broadband supply – private households	Proportion of households that have access to a bandwidth of 50 Mbit / s among the total number of households	Type I
		Broadband supply – companies	Proportion of companies that have access to a bandwidth of 50 Mbit / s among the total number of companies	Type II
10	Reduced inequalities	Employment rate – foreigners	Ratio of employment rate of foreigners to total employment rate	Type I
		School drop-out rate – foreigners	Ratio of school dropout rate of foreigners to total school dropout rate	Type I
		Income distribution – gini coefficient	Distribution of equivalenced disposable income per inhabitant by means of Gini coefficient	Type II
		Naturalisations	Number of naturalised inhabitants in the respective year as a proportion of the total number of foreign inhabitants	Type I
		Proportion of migrants in the city council, municipal council or district council	Proportion of seats in the city council, local council or district council held by people with a migrant background	Type II
		Projects with migrant organisations	Projects carried out by the municipality together with migrant organisations in relation to the number of inhabitants	Type II

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11	Sustainable cities and communities	Rental prices	Average net cold rent per m^2	Type I
		Housing cost burden	Proportion of households spending more than 40 per cent of their disposable income on housing in relation to the total number of households	Type II
		Living space	Available living space in m2 per inhabitant	Type I
		Basic supply close to home – supermarket	Population-weighted linear distance in metres to the nearest supermarket or discounter store	Type I
		Modal split	Proportions of walking, cycling and public transport in total traffic volume	Type II
		Car density	Number of cars per 1,000 inhabitants	Type I
		Cars with electric motors	Proportion of registered cars with electric motors including plug-in hybrids among the total number of registered cars	Type I
		Cycling path network	Length of cycling path network per 1,000 inhabitants	Type II
		Public transport – local services with bus stops	Proportion of inhabitants with a maximum linear distance of 1 km to the nearest public transport stop with at least ten departures per day	Type II
		Public transport – accessibility of medium / upper centres	Average travel time by public transport to the nearest medium or upper centre	Type II
		Traffic casualties	Number of persons injured or killed in traffic accidents per 1,000 inhabitants	Type I
		Land use	Proportion of settlement and transport area in relation to total area	Type I
		New land use	Change in settlement and transport area compared to the previous year based on total area	Type I
		Land use intensity	Settlement and transport area per inhabitant	Type I
		Local recreation areas	Recreation area per inhabitant	Type I
		Mobility in Urban, Suburban and Rural Settings Index	Sum index of dichotomous variables, based on a standardised questionnaire on mobility in urban, suburban and rural settings	Type II
		Completed residential buildings with renewable heating energy	Proportion of completed residential buildings with renewable heating energy from the total of all completed residential buildings	Type I
		Rate of upgrades of buildings to improve energy efficiency	Proportion of buildings renovated for energy efficiency in the number of all buildings	Type II
12	Responsible consumption and production patterns	Fairtrade Town	Status of the municipality's Fairtrade Town designation(s)	Type I
		Fairtrade Schools	Proportion of all schools designated as Fairtrade Schools among all schools	Type I
		Expenditure on Fairtrade products	Municipal expenditure on fair trade products as a proportion of total municipal expenditure	Type II
		Drinking water consumption – private households	Drinking water consumption (households and small businesses) per inhabitant per day	Type I
		Drinking water consumption – industry, commerce, trade and services	Drinking water consumption of industry, commerce, trade and services per person employed at place of work and day	Type II
		Energy consumption – private households	Direct and indirect energy consumption of private households per inhabitant	Type II
		Energy consumption – industry, commerce, trade and services	Direct and indirect energy consumption of industry, trade, commerce and services per person employed at the place of work	Type II
		Amount of waste	Amount of household waste (excluding old electrical appliances) in tonnes per inhabitant	Type I
		Recycling rate	Proportion of municipal waste recycled in relation to total municipal waste generated	Type II
		EMAS-certified operating sites	EMAS-certified operating sites as a proportion of all operating locations	Type II
		Operating sites with environmental or sustainability certificates	Proportion of operating sites with environmental or sustainability certificates in relation to all operating sites	Type II
		Sustainable Procurement Index	Sum index of dichotomous variables, based on a standardised questionnaire on the procurement process	Type II
		Sustainable procurement procedures	Proportion of sustainable procurement procedures in relation to the total number of procurement procedures	Type II

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13	Climate action	Ecological forest restructuring	Proportion of ecologically restructured forest area in the total forest area	Type II
		Urban tree areas	Proportion of tree rows or groups of trees with an area of 500 m² or more and a minimum width of 10 m on "artificial" surfaces in the total area	Type I
		Settlement density in floodplain area	Proportion of built-up settlement and traffic areas in the officially designated floodplain in relation to the area of the designated floodplain in the territorial unit	Type I
		Municipal Climate Adaptation Index	Sum index of dichotomous variables, based on a standardised questionnaire on municipal climate adaptation	Type II
		Greenhouse gas emissions – private households	Greenhouse gas emissions of private households per inhabitant	Type I
		Greenhouse gas emissions – industry and manufacturing	Greenhouse gas emissions from industry and manufacturing per inhabitant	Type I
		Greenhouse gas emissions – industry / commerce, trade, services and other	Greenhouse gas emissions from industry / commerce, trade, services and other per inhabitant	Type I
		Greenhouse gas emissions – municipal facilities	Greenhouse gas emissions of municipal facilities per inhabitant	Type I
		Greenhouse gas emissions – transport	Greenhouse gas emissions from motorised transport in domestic, incoming and outgoing traffic per inhabitant	Type I
		Greenhouse gas reductions through climate protection projects	Actual and potential reductions in greenhouse gas emissions as a result of the municipal guideline within the framework of the National Climate Protection Initiative	Type I
		Municipal Climate Protection Index	Sum index of dichotomous variables, based on a standardised questionnaire on municipal climate protection	Type II
		Human resources in municipal climate protection	Full-time equivalent positions in municipal climate protection per 1,000 inhabitants	Type II
14	Life below water	Watercourse quality	Proportion of watercourse length with ecological status ratings of "very good" and "good" in relation to the total watercourse length in the territorial unit	Type I
		Nutrient load in watercourses	Average total phosphorus concentration in mg / l in watercourses	Type II
15	Life on land	Sustainable forestry	Proportion of certified forest area according to PEFC or FSC in the total forest area	Type II
		Nature conservation areas	Proportion of nature conservation areas with high protection status (Natura 2000 areas, nature conservation areas and national parks) in relation to the total forest area	Type I
		Landscape quality	Total of all human interventions in the natural balance (Hemeroby Index)	Type I
		Non-dissected open space areas	Proportion of undissected open space areas >50 km² which are not dissected by routes of the interurban transport network in relation to the total area	Type I
		Bird species diversity	Actual value of the Bird Species Number Index measured against the target value of the Bird Species Number Index	Type II
16	Peace, justice and strong institutions	Crimes	Number of recorded crimes per 1,000 inhabitants	Type I
		Corruption Prevention Index	Sum index of dichotomous variables, based on a standardised questionnaire on municipal corruption prevention measures	Type II
		Financial resources balance	Budget surplus or deficit per inhabitant	Type I
		Tax revenue	Tax revenue per inhabitant	Type I
		Liquidity loans	Liquidity / cash credits in the core budget per inhabitant	Type I
		Credit financing ratio	Borrowing in relation to the adjusted expenditure of the municipality	Type II
		Interest-tax ratio	Interest expenditure or expense in relation to the municipality's tax revenue or income	Type II
		Digital Municipality Index	Sum index of dichotomous variables, based on a standardised questionnaire on digitalisation processes	Type II
		Participation in local elections	in the municipality	Type II
		Informal citizen participation	Proportion of voters in the electorate of a municipality	Type II
17	Partnerships for the goals	Expenditure on municipal development services	ODA expenditure on municipal development services per 10,000 inhabitants	Type II
		Partnerships in Global South countries	Number of partnerships with partners in DAC countries that are not limited in time or scope per 10,000 inhabitants	Type I
		Project partnerships with partners in countries of the Global South	Number of partnerships with partners in DAC countries that are limited in time and scope per 10,000 inhabitants	Type I
		Development policy projects	Number of development policy projects in which the municipality was involved in the reporting year per 10,000 inhabitants	Type II

Type I indicators are qualitatively well suited for mapping the respective sustainability goals, and municipal data are readily available from central sources.

Type II indicators are qualitatively (very) well suited for mapping the respective sustainability goals, and municipal data are readily available from central sources

Contact details

Members and Contact Persons of the Working Group "SDG-Indicators for Municipalities"

Bertelsmann Stiftung
Carl-Bertelsmann-Straße 256
33311 Gütersloh

Henrik Riedel
Telefon: +49 5241 81 81266
E-Mail: henrik.riedel@bertelsmann-stiftung.de

Oliver Haubner
Telefon: +49 5241 81 81119
E-Mail: oliver.haubner@bertelsmann-stiftung.de

BertelsmannStiftung

Bundesinstitut für Bau-, Stadt- und Raumforschung
Deichmanns Aue 31-37
53179 Bonn

Antonia Milbert
Telefon: +49 228 99401 2256
E-Mail: antonia.milbert@bbr.bund.de

Dr. André Müller
Telefon: +49 228 99401 2341
E-Mail: andre.mueller@bbr.bund.de

Bundesinstitut
für Bau-, Stadt- und
Raumforschung
im Bundesamt für Bauwesen
und Raumordnung

Deutscher Landkreistag
Lennéstraße 11
10785 Berlin

Nadine Schartz
Telefon: +49 30 590097 319
E-Mail: nadine.schartz@landkreistag.de

DEUTSCHER
LANDKREISTAG

Deutscher Städtetag
Gereonstraße 18 - 32
50670 Köln

Sabine Drees
Telefon: +49 221 3771 214
E-Mail: sabine.drees@staedtetag.de

Deutscher Städte- und Gemeindebund
Marienstr. 6
12207 Berlin

Alexander Kramer
Telefon: +49 30 77307 117
E-Mail: alexander.kramer@dstgb.de

Deutsches Institut für Urbanistik
Zimmerstraße 13-15
10969 Berlin

Oliver Peters
Telefon: +49 30 39001 204
E-Mail: opeters@difu.de

Dr. Jasmin Jossin
Telefon: +49 30 39001 200
E-Mail: jossin@difu.de

ICLEI European Secretariat
Leopoldring 3
79098 Freiburg i. Brsg.

Stefan Kuhn
Telefon: +49 761 36892 66
E-Mail: stefan.kuhn@iclei.org

Rat der Gemeinden und Regionen Europas /
Deutsche Sektion
Gereonstraße 18 - 32
50670 Köln

Sabine Drees
Telefon: +49 221 3771 214
E-Mail: sabine.drees@staedtetag.de

www.sdg-portal.de