New Urban Agenda Monitoring Framework

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1. Introduction

The New Urban Agenda[1] (NUA) was adopted at the United Nations Conference on Housing and Sustainable Development (Habitat III) in Quito, Ecuador on 20 October 2016. 197 Member States participated in the preparation of the New Urban Agenda and adopted it. It represents a shared vision of prosperous, just, safe, healthy, accessible, affordable and resilient and sustainable cities. The General Assembly endorsed the New Urban Agenda on 23 December 2016 in its resolution 71/256. The New Urban Agenda is aligned with the New Strategic Plan of UNHABITAT which has four Domains of Change: (1) Reduced spatial inequality and poverty in communities across the urban-rural continuum; (2) Enhanced shared prosperity for cities and regions; (3) Strengthened climate action and improved urban environment; and (4) Effective urban crisis prevention and response.

In 2050, two-thirds of the world's population will live in urban areas. Ninety percent of urban growth will occur in less developed regions such as East Asia, South Asia, and Sub-Saharan Africa, where in most cases, capacities and resources are most constrained and development challenges are most intense. The regions are growing at varying rates, and urbanization is increasing in all regions. However, urbanization in these developing countries is largely unplanned, fueling the continuous growth of informal or slum settlements. Inequality is another pressing universal concern, both within cities and across territories; over 75 percent of the world's cities grew more unequal over the past 20 years[2]. A second salient feature of urbanization is the emergence of many large megacities, particularly in the low- and middle-income regions of the world. A third but not least feature is the impact of rapid urbanization on the planet's climate. All these developments have called for coordinated global response from the Member States of the United Nations in the form of the global agendas: Sustainable Development Goals, Paris Climate Change Accord and the New Urban Agenda.

The transformative commitments of the New Urban Agenda present desired outcomes of sustainable urbanization. The New Urban Agenda lays out effective means of its implementation itself. Member States called for proper monitoring of progress towards achieving the desired outcomes of NUA. This would be presented periodically by the Secretary General in the Quadrennial Reports and in other flagship publications of the United Nations.

With the adoption of the New Urban Agenda, Member States made transformative commitments which are grouped into the following three categories: (i) sustainable urban development for social inclusion and ending poverty; (ii) sustainable and inclusive urban prosperity for all; and (iii) environmentally sustainable and resilient development. The "Guidelines for Reporting on the Implementation of the New Urban Agenda" was prepared in order to facilitate the preparation of national reports on the progress of the implementation of the New Urban Agenda. The Guidelines proposed categories or themes which countries should monitor utilizing indicators which it did not specify. The New Urban Agenda Monitoring Framework proposes indicators for those categories and themes that were listed in the "Guidelines for Reporting on the Implementation of the New Urban Agenda". Hence, the indicators proposed by the Monitoring Framework are consistent with the Guidelines.

Many of the transformative commitments are strongly aligned or are the same as some of the Targets of the Sustainable Development Goals (SDG). Hence it is only appropriate that such Transformative Commitments are monitored utilizing the corresponding SDG indicators. Some of the transformative Commitments can be efficiently monitored with global indicators used to monitor the City Prosperity Index dimensions. One of the transformative Commitment that Member States committed to adopt was a smart-city approach that makes use of opportunities

[1] The New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf
[2] *Ibid*

from digitalization, clean energy and technologies, as well as innovative transport technologies and boost sustainable economic growth and enabling cities to improve their service delivery (NUA § 27).

In April 2016[3] a Task Force comprised of experienced experts in urbanization from within and outside UNHABITAT, developed the Action Framework for Implementation of the New Urban Agenda (AFINUA). The experts mapped indicators onto five main pillars of implementation (1) national urban policies, with six key elements, (2) urban legislation, rules and regulations, with nine key elements, (3) urban planning and design, with eight key elements, (4) urban economy and municipal finance, with six key elements, and (5) local implementation. Some of the indicators were SDG indicators and the remainder were global indicators used to monitor dimensions of the City Prosperity Index. However, with the passage of time and accumulation of lessons learned, the consensus among urbanization experts has been that it is more logical to categorize indicators for monitoring the New Urban Agenda into the following categories: : (i) sustainable urban development for social inclusion and ending poverty; (ii) sustainable and inclusive urban prosperity for all; and (iii) environmentally sustainable and resilient development as well as indicators for monitoring the "Effective Implementation" of the New Urban Agenda.

[3] UNHABITAT, "Action Framework for Implementation of the New Urban Agenda", April 2016, http://nua.unhabitat.org/AFINUA19thApr.pdf

2. The Need for Monitoring the New Urban Agenda[4]

The New Urban Agenda Monitoring Framework is essential for tracking progress, assessing impact and assessing whether the New Urban Agenda's implementation is on track and well executed. It also allows the residents of a city or country to hold local and central governments accountable for implementation of the New Urban Agenda (NUA § 161).

The Monitoring Framework is based on "Guidelines for Reporting on the Implementation of the New Urban Agenda"; it proposes a list of indicators that all central and local governments can collect information on. It will ensure comparability among cities and countries in the way NUA is monitored. The New Urban Agenda recognizes the effective linkages and synergies between monitoring of itself and the 2030 Agenda for Sustainable Development to ensure coherence in their implementation (NUA § 164). It is in that context that 24 of the 75 indicators of the NUA Monitoring Framework are SDG indicators. Hence, NUA monitoring will contribute directly to SDG monitoring and *vice versa*.

Local and central governments can use the list of indicators in the NUA Monitoring Framework to monitor NUA. Thus, they will be in position to provide comparable indicator data for monitoring NUA for the Secretary General's quadrennial report on progress on implementation of NUA (NUA §127, 128,129) to the General Assembly. UNHABITAT coordinates the preparation of the quadrennial report and this Monitoring Framework lays the groundwork for comparable indicator data to be used in future quadrennial reports and as well as for Member States and Cities' own policy formulation as well as maintaining coherence with the 2030 Agenda for Sustainable Development.

In the "Guidelines for Reporting on the Implementation of the New Urban Agenda", the transformative commitments are grouped by theme, for instance, all transformative commitments dealing with ending poverty are in the theme 1.1.1 "Social Inclusion and Ending Poverty" in category 1.1 "Sustainable Urban Development for Social Inclusion and Ending Poverty". Similarly, all transformative commitments relating housing fall under 1.1.2 "Access to Adequate Housing".

The theme ""Social Inclusion and Ending Poverty" is divided into four areas, which are (1) Eradicate poverty in all its forms; (2) Address inequality in urban areas by promoting equally shared opportunities and benefits; (3) Enhance social inclusion of vulnerable groups (women, youth, older persons and persons with disabilities and migrants); and (4) Ensure access to public spaces including streets, sidewalks, and cycling lanes. In this New Urban Agenda Monitoring Framework, at least one indicator has been identified under each the four areas for monitoring progress. For example, SDG-1.1.1 "Proportion of population below the international poverty line, by sex, age at national urban level", will be used to monitor are (1) "Eradicate poverty in all its forms". In situations where the area is the same or close to a particular SDG target, one of the SDG indicators for that target has been selected for monitoring that area. However, where there was no obvious SDG indicator, indicators have been selected from the global indicators for monitoring the dimensions of the City Prosperity Index or from the Urban Indicator Guidelines or a new indicator has been included. There are five and two indicators from the global indicators for monitoring dimensions of the City Prosperity Index or the Urban Indicator Guidelines, respectively.

Regarding the numbering convention to be followed in this Framework, all indicators are numbered from 1 to 78 for ease of use. SDG indicators are the first 25. Summary information about the indicators is in Table 1.

[4] This section will be strengthened (more points added)

1.1 Sustainable urban development for social inclusion and ending poverty

1.1.1 Social Inclusion and Ending Poverty:

1.1.1.1 Eradicate poverty in all its forms

1 Proportion of population below the international poverty line, by sex, age at national urban level

1.1.1.2 Address inequality in urban areas by promoting equally shared opportunities and benefits

10: Unemployment rate, by sex, age, persons with disabilities and by city

32. Gini coefficient at national/city/ urban levels;

1.1.1.3 Enhance social inclusion of vulnerable groups (women, youth, older persons and persons with disabilities and migrants)

4 Women's recognised legal right to property inheritance and ownership

33 Presence of national legislation forbidding discrimination in housing on the basis of race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status

1.1.1.4 Ensure access to public spaces including streets, sidewalks, and cycling lanes

19: Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities.

34 Length of bicycle lane to length of roads (excluding motorways).

35 Length of sidewalks to length of roads (excluding motorways).

1.1.2 Access to Adequate Housing:

1.1.2.1 Ensure access to adequate and affordable housing

31: Ratio of the median annual rent of a dwelling unit and the median annual household income of tenants; and Ratio of the median free-market price of a dwelling unit and the median annual household income[5]

37 Percentage of people living in unaffordable housing

[5] *ibid*

1.1.2.2 Provide access to sustainable housing finance options

36a Mortgage debt relative to GDP

36b The mortgage default rate

1.1.2.3 Support security of tenure

2 Proportion of total adult Population with secure tenure rights to land with (a) legally recognized documentation; and (b) who perceive their rights to land as secure, by sex and type of tenure

1.1.2.4 Establish slum upgrading programmes

13b Percentage change in the number of households living in slum conditions.

38a Proportion of cities with slum upgrading programmes

38b Number of cities having annual budget allocations addressing any of the 5 slum deprivations in known slum areas

1.1.2.5 Integrate housing into urban development plans

39 Percentage of cities that have integrated housing policies and regulations in their local development plans[6]

40 total investment in housing (in both formal and informal sectors in the urban area), as a percentage of gross city product.[7]

41 Percentage of government budget dedicated to housing subsidies [8]

1.1.3 Access to Basic Services:

1.1.3.1 Access to safe drinking water, sanitation and solid waste disposal

5 Proportion of population using safely managed drinking water services;

6 Proportion of population using safely managed sanitation services;

18: Proportion of MUNICIPAL solid waste collected and managed in controlled facilities;

1.1.3.2 Access to safe and efficient public transport system

[6] This is to understand the role of housing within National Urban Policies and plans, whether is treated as a central element (as per the Housing@centre approach) or if it not included.
[7] This is to understand the performance of the housing sector in contributing to the economic development of the city.
[8] Will determine if governments are spending enough and effectively on social housing.

42 Percentage of commuters using public transport.

1.1.3.3 Access to modern renewable energy

7 Renewable energy share in the total final energy consumption

1.1.3.4 Access to Information Communication technology (ICT)

25: Fixed Internet broadband subscriptions per 100 inhabitants, by speed;

1.2 Sustainable and inclusive urban prosperity and opportunities for all

1.2.1 Inclusive Urban Economy

1.2.1.1 Promote productive employment for all including youth employment

11: Proportion of youth (aged 15-24 years) not in education, employment or training

8: Annual growth rate of real GDP per employed person

1.2.1.2 Support the informal economy

9: Proportion of informal employment in non-agriculture employment, by sex.

1.2.1.3 Support small- and medium-sized enterprises

43 Small- and medium-sized enterprises percentage share of GDP.

1.2.1.4 Promote an enabling, fair and responsible environment for business and innovation

26: Number of days to register a new business in the country

1.2.2 Sustainable Urban Prosperity

1.2.2.1 Support the diversification of the urban economy and promote cultural and creative industries

44 Employment in cultural and creative industries of as proportion of total employment

12: Manufacturing employment as proportion of total employment

1.2.2.2 Develop technical and entrepreneurial skills to thrive in a modern urban economy

45 Annual number of vocational and technical education individuals trained

1.2.2.3 Strengthen urban-rural linkages to maximize productivity

20: Does your country have a National Urban Policy or Regional Development Plan that (a) responds to population dynamics, (b) ensures balanced territorial development, and (c) increase in local fiscal space. [9]

1.3 Environmentally sustainable and resilient urban development

1.3.1 Resilience, Mitigation, and Adaption of Cities and Human Settlements:

1.3.1.1 Address urban sprawl and loss of biodiversity[10]

15: Ratio of land consumption rate to population growth rate.

46: Percentage of land under protected natural areas.

1.3.1.2 Climate change mitigation and adaptation actions

47: Percentage of local governments that adopt and implement local disaster risk reduction strategies in line with national strategies.

48: Percentage national/subnational/local government budgets dedicated to climate change mitigation and adaptation actions.

49: Percentage of cities with multi-hazard mapping

30: CO2 Emissions (reversed)

3: For a given city/ human settlement, mortality rate attributed to household and ambient air pollution[11]

1.3.1.3 Develop systems to reduce the impact of natural and human-made disasters[12]

50: Does the country have a multi-hazard monitoring and forecasting system?

51: Substantially increase the availability of and access to multi hazard early warning systems and disaster risk information and assessments to the people by 2030: Number of cities that have / percentage of urban population that is covered by multi-hazard early warning systems.

1.3.1.4 Build urban resilience through quality infrastructure and spatial planning

49 Percentage of cities with multi-hazard mapping

52: Number of city staff accredited to the city climate planner training program

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[9] Adapted from https://unhabitat.org/un-habitat-for-the-sustainable-development-goals/11-a-urban-rural-linkages/

[10] https://www.researchgate.net/publication/259216460_Indicators_for_Management_of_Urban_Biodiversity_and_Ecosystem_Services_City_Biodiversity_Index/download

[11] SDG 3.9.1 methodology applied at the local level

[12] https://www.preventionweb.net/sendai-framework/sendai-framework-monitor/indicators

1.3.2 Sustainable Management and use of natural resources

1.3.2.1 Strengthen the sustainable management of natural resources in urban areas[13]

21: Material footprint, material footprint per capita, and material footprint per GDP.

22: Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP.

27: Green Area per capita

1.3.2.2 Promote resource conservation and waste reduction, reuse, and recycling

23: Recycling rate, tons of material recycled.

1.3.2.3 Implement environmentally sound management of water resources and coastal areas

53 Existence of an enforced coastal and/or land management plan.

1.3.2.4 Adopt a smart-city approach that leverages digitization, clean energy and technologies [14]

54: Percentage reduction in annual final energy consumption in homes using smart monitoring systems.

55: Decreased delay by traffic congestion on streets with traffic lights connected to traffic management systems.

Effective Implementation

2.1 Building Governance Structure: Establishing a supportive Framework

2.1.1 Decentralization to enable subnational and local governments undertake their assigned responsibilities[15]

56: Is supervision of local authorities exercised in accordance with such procedures and in such cases as provided for by the constitution or by law?

57: Percentage of the total budget that the local / sub-national government have discretion over to decide on priorities (financial autonomy)

[13] This is related to SDG target 12..2, "By 2030, achieve the sustainable management and efficient use of natural resources" which has indicators: "12.2.1 Material footprint, material footprint per capita, and material footprint per GDP" and "12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP".

[14] https://www.researchgate.net/publication/326227723_CITYkeys_indicators_for_smart_city_projects_and_smart_cities/download

[15] UNHABITAT, "International Guidelines on Decentralization and Access to Basic Services for all", 2009, ISBN Number: 978-92-1-132174-6

58: Percentage of the local / sub-national government's financial resources generated from endogenous (internal) sources of revenue

2.1.2 Linking urban policies to finance mechanisms and budgets

58: Percentage of the local / sub-national government's financial resources generated from endogenous (internal) sources of revenue

2.1.3 Legal and policy frameworks to enhance the ability of governments to implement urban policies

59: Quality of law

2.1.4 Strengthen the capacity of local and subnational governments to implement local and metropolitan multilevel governance

60: Published performance delivery standards at the sub-national level

2.1.5 Promote participatory, age- and gender-responsive approaches to urban policy and planning

16: Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratic.

2.1.6 Promote women's full participation in all fields and all levels of decision-making

24: Proportions of positions (by sex, age, persons with disabilities and population groups) in public institutions (national and local legislatures, public service, and judiciary) compared to national distributions

2.2 Planning and Managing Urban Spatial Development

2.2.1 Integrated and balanced territorial development policies

20: Does the countries have a National Urban Policy or Regional Development Plan that (a) responds to population dynamics, (b) ensures balanced territorial development, and (c) increase in local fiscal space.[16]

61 Number of countries, regional governments, and cities in which plans and designs are publicly accessible to residents (on-line) and can be consulted at all times

2.2.2 Integrate housing into urban development plans

13: Proportion of urban population living in slums, informal settlements or inadequate housing.

2.2.3 Inclusion of culture as a priority component of urban planning

17: Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage, level of government, type of

[16] Means of verification: SDG reports (this had been reported since 2017), and Global report on National Urban Policies

expenditure and type of private funding. [In the metadata, include a statement that, that "percent of city-level expenditure on urban heritage and culture" should be computed and presented too]

2.2.4 Planned urban extensions and infill, urban renewal and regeneration of urban areas

28: Population Density

29: Land-use mix

62: Number and per cent of new population "accommodated" in a plan or city extension

2.2.5 Improved capacity for urban planning and design, and training for urban planners at all levels of government

63: Number of urban planners per 100,000 persons

64: Number of planners registered in a country in the public sector

2.2.6 Strengthening the role of small and intermediate cities and towns

65: Percentage of urban population living in small and intermediate cities and towns[17]

2.2.7 Promote sustainable multimodal public transport systems including non-motorized options

14: Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities

2.3 Means of Implementation

2.3.1 Mobilization of Financial Resources

2.3.1.1 Develop financing frameworks for implementing the NUA at all levels of government

66

a) Existence of structure or office or committee or taskforce for implementing the New Urban Agenda;
b) Integration of New Urban Agenda in national urbanization and infrastructure strategies / plans.

2.3.1.2 Mobilize endogenous (internal) sources of finance and expand the revenue base of subnational and local governments

57 Percentage of the total budget that the local / sub-national government have discretion over to decide on priorities (financial autonomy)

58 Percentage of the local / sub-national government's financial resources generated from endogenous (internal) sources of revenue

2.3.1.3 Promote sound systems of financial transfers from national to subnational and local governments based on needs, priorities and functions

[17] Small cities (100,000 - 500,000) intermediate cities (500,000 - one million) large cities (one to five million), very large cities (over five million), reference World Cities Report 2016 page 84.

67: Stable existence of “transfer formula” in the last 5 years, without major changes, meaning reductions of more than 10%.

2.3.1.4 Mobilize and establish financial intermediaries (multilateral institutions, regional development banks, subnational and local development funds; pooled financing mechanisms etc.) for urban financing

68: Existence of at least one finance or infrastructure fund available for local / sub-national governments.

69: Percentage of the local / sub-national government’s financial resources generated from financial intermediaries such as multilateral institutions, regional development banks, subnational and local development funds, or pooled financing mechanisms.

2.3.2 Capacity Development

2.3.2.1 Expand opportunities for city-to-city cooperation and fostering exchanges of urban solutions and mutual learning

70: Number of cities participating in city to city programmes[18]

2.3.2.2 Promote the capacity development as a multifaceted approach to formulate, implement, manage, monitor and evaluate urban development policies

71: Percentage of cities and subnational governments with staff trained in formulation, implementation, managing, monitoring and evaluation of urban development policies.

2.3.2.3 Strengthen the capacity of all levels of government to work with vulnerable groups to participate effectively in decision-making about urban and territorial development.

16: Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratic.

2.3.2.4 Support local government associations as promoters and providers of capacity development

72: Size of budget of local government associations

2.3.2.5 Promote capacity development programmes on the use of legal land-based revenue and financing tools

73: Number of people who have been trained in the use of land-based revenue and financing tools by UN-Habitat or other institutions

[18] city to city programmes like the UCLG (https://www.uclg.org/en/issues/city-city-cooperation) and SisterCities International (https://sistercities.org/)

2.3.2.6 Promote capacity development programmes of subnational and local governments in financial planning and management

74: Percentage of cities/subnational staff trained in financial planning and management

2.3.3 Information Technology and Innovation

2.3.3.1 Development of user-friendly, participatory data and digital platforms through e-governance and citizen-centric digital governance tools

75: Percentage of cities utilizing e-governance and citizen-centric digital governance tools

2.3.3.2 Use of digital tools, including geospatial information systems to improve urban and territorial planning, land administration and access to urban services

76: Percentage of cities utilizing geospatial information systems

2.3.3.3 Strengthen capacities at all levels of government to effectively monitor the implementation of urban development policies

77: Percentage of cities with capacity to effectively monitor the implementation of urban development policies

2.3.3.4 Support all levels of governments in the collection, disaggregation, and analysis of data

78: Number of countries that have participated in capacity building workshops on New Urban Agenda indicators.

3. Table 1: List of Indicators for Monitoring the New Urban Agenda

NUA Code	Indicator	Corresponding Section in the Guidelines
1	Proportion of population below the international poverty line, by sex, age at national urban level (SDG-1.1.1)	1.1.1.1
2	2 Proportion of total adult Population with secure tenure rights to land with (a) legally recognized documentation; and (b) who perceive their rights to land as secure, by sex and type of tenure (SDG-1.4.2).	1.1.2.3
3	For a given city/ human settlement, mortality rate attributed to household and ambient air pollution (SDG-3.9.1)	1.3.1.2
4	Women's recognised legal right to property inheritance and ownership (SDG-5.a.2)	1.1.1.3
5	Proportion of population using safely managed drinking water services (SDG-6.1.1)	1.1.3.1
6	Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water at national urban level (SDG-6.2.1)	1.1.3.1
7	Renewable energy share in the total final energy consumption (SDG-7.2.1)	1.1.3.3
8	Annual growth rate of real GDP per employed person (SDG-8.2.1)	1.2.1.1
9	Proportion of informal employment in non-agriculture employment, by sex (SDG-8.3.1)	1.2.1.2
10	Unemployment rate, by sex, age, persons with disabilities and by city (SDG-8.5.2)	1.1.1.2
11	Proportion of youth (aged 15-24 years) not in education, employment or training (SDG-8.6.1)	1.2.1.1
12	Manufacturing employment as proportion of total employment (SDG-9.2.2)	1.2.2.1
13	Proportion of urban population living in slums, informal settlements or inadequate housing (SDG-11.1.1)	2.2.2
14	Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities (SDG-11.2.1)	2.2.7
15	Ratio of land consumption rate to population growth rate (SDG-11.3.1)	1.3.1.1
16	Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratic (SDG-11.3.2)	2.1.5; 2.3.2.3
17	Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage, level of government, type of expenditure and type of private funding, ["percent of city-level expenditure on urban heritage and culture" should be computed and presented too] (SDG-11.4.1)	2.2.3
18	Proportion of MUNICIPAL solid waste collected and managed in controlled facilities (SDG-11.6.1)	1.1.3.1
19	Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities (SDG-11.7.1)	1.1.1.4
20	Does the countries have a National Urban Policy or Regional Development Plan that (a) responds to population dynamics, (b) ensures balanced territorial development, and (c) increase in local fiscal space (SDG-11.a.1)	1.2.2.3; 2.2.1
21	Material footprint, material footprint per capita, and material footprint per GDP (SDG-12.2.1)	1.3.2.1
22	Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP (SDG-12.2.2)	1.3.2.1
23	Recycling rate, tons of material recycled (SDG-12.5.1)	1.3.2.2
24	Proportions of positions (by sex, age, persons with disabilities and population groups) in public institutions (national and local legislatures, public service, and judiciary) compared to national distributions (SDG-16.7.1)	2.1.6
25	Fixed Internet broadband subscriptions per 100 inhabitants, by speed (SDG-17.6.2)	1.1.3.4
26	Number of days to register a new business in the country	1.2.1.4
27	Green Area per capita	1.3.2.1
28	Population Density	2.2.4
29	Land-use mix	2.2.4
30	CO2 Emissions	1.3.1.2

NUA Code	Indicator	Corresponding Section in the Guidelines
31	Ratio of the median annual rent of a dwelling unit and the median annual household income of tenants; and Ratio of the median free-market price of a dwelling unit and the median annual household income	1.1.2.1
32	Gini coefficient at national / urban levels;	1.1.1.2
33	Presence of national legislation forbidding discrimination in housing on the basis of race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status	1.1.1.3
34	Length of bicycle lane to length of roads (excluding motorways).	1.1.1.4
35	Length of sidewalks to length of roads (excluding motorways).	1.1.1.4
36	a) Mortgage debt relative to GDP b) The mortgage default rate	1.1.2.2
37	Percentage of people living in unaffordable housing	1.1.2.1
39	Percentage of cities that have integrated housing policies and regulations in their local development plans	1.1.2.5
40	Total investment in housing (in both formal and informal sectors in the urban area), as a percentage of gross city product.	1.1.2.5
41	Percentage of government budget dedicated to housing subsidies	1.1.2.5
42	Percentage of commuters using public transport.	1.1.3.2
43	Small- and medium-sized enterprises percentage share of GDP.	1.2.1.3
44	Employment in cultural and creative industries of as proportion of total employment	1.2.2.1
45	Annual number of vocational and technical education individuals trained	1.2.2.2
46	Proportion of land under protected natural areas	1.3.1.1
47	Percentage of local governments that adopt and implement local disaster risk reduction strategies in line with national strategies.	1.3.1.2
48	Percentage national/subnational/local government budgets dedicated to climate change mitigation and adaptation actions.	1.3.1.2
49	Percentage of cities with multi-hazard mapping	1.3.1.2; 1.3.1.4
50	Does the country have a multi-hazard monitoring and forecasting system?	1.3.1.3
51	Substantially increase the availability of and access to multi hazard early warning systems and disaster risk information and assessments to the people by 2030: Number of cities that have / percentage of urban population that is covered by multi-hazard early warning systems.	1.3.1.3
52	Number of city staff accredited to the city climate planner training program	1.3.1.2
53	Existence of an enforced coastal and/or land management plan.	1.3.2.3
54	Reduction in annual final energy consumption homes using smart monitoring systems.	1.3.2.4
55	Decreased delay by traffic congestion on streets with traffic lights connected to traffic management systems.	1.3.2.4
56	Is supervision of local authorities exercised in accordance with such procedures and in such cases as provided for by the constitution or by law?	2.1.1
57	Percentage of the total budget that the local / sub-national government have discretion over to decide on priorities (financial autonomy)	2.3.1.2; 2.1.1
58	Percentage of the local / sub-national government's financial resources generated from endogenous (internal) sources of revenue	2.3.1.2; 2.1.1
59	Quality of law	2.1.3
60	Published performance delivery standards at the sub-national level	2.1.4
61	Number of countries, regional governments, and cities in which plans and designs are publicly accessible to residents (on-line) and can be consulted at all times	2.2.1
62	Number and per cent of new population "accommodated" in a plan or city extension	2.2.4
63	Number of urban planners per 100,000 persons	2.2.5
64	Number of planners registered in a country in the public sector	2.2.5

NUA Code	Indicator	Corresponding Section in the Guidelines
65	Percentage of urban population living in small and intermediate cities and towns	2.2.6
66	a) Existence of structure or office or committee or taskforce for implementing the New Urban Agenda; b) Integration of New Urban Agenda in national urbanization and infrastructure strategies / plans.	2.3.1.1
67	Stable existence of “transfer formula” in the last 5 years, without major changes, meaning reductions of more than 10%.	2.3.1.3
68	Existence of at least one municipal finance or infrastructure fund available for local governments	2.3.1.4
69	Percentage of local / sub-national government’s financial resources generated from financial intermediaries such as multilateral institutions, regional development banks, subnational and local development funds, or pooled financing mechanisms.	2.3.1.4
70	Number of cities participating in city to city programmes	2.3.2.1
71	Percentage of cities and subnational governments with staff trained in formulation, implementation, managing, monitoring and evaluation of urban development policies.	2.3.2.2
72	Size of budget of local government associations	2.3.2.4
73	Number of people who have been trained in the use of land-based revenue and financing tools by UN-Habitat or other institutions	2.3.2.5
74	Percentage of cities/subnational staff trained in financial planning and management	2.3.2.5
75	Percentage of cities utilizing e-governance and citizen-centric digital governance tools	2.3.3.1
76	Percentage of cities utilizing geospatial information systems	2.3.3.2
77	Percentage of cities with capacity to effectively monitor the implementation of urban development policies	2.3.3.3
78	Number of countries that have participated in capacity building workshops on New Urban Agenda indicators.	2.3.3.4

4. Indicator Definitions

1: Proportion of population below the international poverty line, by sex, age at national urban level (urban/rural)

Definition:

The indicator Proportion of population below the international poverty line is defined as the percentage of the population living on less than $1.90 a day at 2011 international prices. The 'international poverty line' is currently set at $1.90 a day at 2011 international prices.[19]

Rationale:

Monitoring poverty is important for both national and international economic planning purposes. The data is used to formulate poverty reduction policies. One of the major obstacles to sustainable development worldwide is the high proportion of populations in many countries that are enduring of multiple forms of poverty (NUA §3). the New Urban Agenda aims to end poverty and hunger in all its forms and dimensions (NUA §3). One way of ensuring the principle that no one is left behind is by ending poverty. In the New Urban Agenda, Member States committed eradicating poverty in all its forms and dimensions, including extreme poverty (NUA §25).

Computation Method:

The original one dollar a day poverty line was based on averaging 22 national poverty lines in the 1980s. Since then, Ravalion, Chen and Sangraula (2009) proposed a new international poverty line at $1.25 a day, which is an average of national poverty lines of the poorest 15 countries out of 75 developing countries. The current extreme poverty line is $1.90 a day 2011 PPP is arrived at after adjusting for cost of living in the developing countries. It is important to note that national poverty lines are not comparable across countries or with the international poverty line of $1.90 per day.

To compute the international poverty line for a country, the international poverty line is converted into national currency in 2011 prices, which is then adjusted to prices for the time period of the household survey using the consumer price index, then the poverty rate for the country is computed.

Data Sources:

National statistical offices.

References:

https://unstats.un.org/sdgs/metadata/

http://iresearch.worldbank.org/PovcalNet/index.htm

[19] This is the original definition

2: Proportion of total adult Population with secure tenure rights to land with (a) legally recognized documentation; and (b) who perceive their rights to land as secure, by sex and type of tenure

Definition:

The indicator measures the proportion of men, women and other vulnerable groups that have documented secure tenure and those who think that they have secure tenure. Secure tenure rights comprise legally recognized documentation and the perception of the security of tenure. Both have to be present for there to be tenure security.

Rationale:

Land is key to poverty reduction, when owners of land have legally documented ownership and perceive that they have tenure security, then they can invest as well as use the land as collateral to get loans to invest on the land. Hence, land tenure can unlock access to capital that can be used develop the land. Secure of tenure should also apply to women. They should have the same rights as men.

This indicator will encourage governments to improve their performance in terms of land governance. It will also provide information on implementation capacity as well as lead to equality of security of tenure for men and women.

Computation Method:

The indicator is the average of proportion adult population with recognized documentation to land and the proportion with who perceive that their rights are secure.

A= [(Adult population with recognized documentation over land)/(Total Adult population)]X100

B= [(Adult population who perceive their rights as secure)/(Total Adult population)]X100

Indicator 2 = (A+B)/2

Reference:

https://unstats.un.org/sdgs/metadata/

3: Mortality rate attributed to household and ambient air pollution

Definition:

The mortality attributable to the joint effects of household and ambient (outdoor) air pollution can be expressed as: Number of deaths, Death rate. Death rates are calculated by dividing the number of deaths by the total population (or indicated if a different population group is used, e.g. children under 5 years)[20].

Evidence from epidemiological studies have shown that exposure to air pollution is linked, among others, to the important diseases taken into account in this estimate:

- Acute respiratory infections in young children (estimated under 5 years of age);
- Cerebrovascular diseases (stroke) in adults (estimated above 25 years);
- Ischaemic heart diseases (IHD) in adults (estimated above 25 years);
- Chronic obstructive pulmonary disease (COPD) in adults (estimated above 25 years); and
- Lung cancer in adults (estimated above 25 years).

Rationale:

As part of a broader project to assess major risk factors to health, the mortality resulting from exposure to ambient (outdoor) air pollution and household (indoor) air pollution from polluting fuel use for cooking was assessed. Ambient air pollution results from emissions from industrial activity, households, cars and trucks which are complex mixtures of air pollutants, many of which are harmful to health. Of all of these pollutants, fine particulate matter has the greatest effect on human health. Polluting fuels include wood, coal, animal dung, charcoal, crop wastes and kerosene. Air pollution is the biggest environmental risk to health. Most of the burden is borne by the populations in low and middle-income countries.

Member States committed themselves to improving household and ambient air quality in the New Urban Agenda (NUA §67).

Comments and limitations:

An approximation of the combined effects of risk factors is possible if independence and little correlation between risk factors with impacts on the same diseases can be assumed (Ezzati et al, 2003). In the case of air pollution, however, there are some limitations to estimate the joint effects: limited knowledge on the distribution of the population exposed to both household and ambient air pollution, correlation of exposures at individual level as household air pollution is a contributor to ambient air pollution, and non-linear interactions (Lim et al, 2012; Smith et al, 2014). In several regions, however, household air pollution remains mainly a rural issue, while ambient air pollution is predominantly an urban problem. Also, in some continents, many countries are relatively unaffected by household air pollution, while ambient air pollution is a major concern. If assuming independence and little correlation, a rough estimate of the total impact can be calculated, which is less than the sum of the impact of the two risk factors.

Methodology

[20] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened.

Computation Method:

Attributable mortality is calculated by first combining information on the increased (or relative) risk of a disease resulting from exposure, with information on how widespread the exposure is in the population (e.g. the annual mean concentration of particulate matter to which the population is exposed, proportion of population relying primarily on polluting fuels for cooking).

This allows calculation of the 'population attributable fraction' (PAF), which is the fraction of disease seen in a given population that can be attributed to the exposure (e.g. in that case of both the annual mean concentration of particulate matter and exposure to polluting fuels for cooking).

Applying this fraction to the total burden of disease (e.g. cardiopulmonary disease expressed as deaths), gives the total number of deaths that results from exposure to that particular risk factor (in the example given above, to ambient and household air pollution).

To estimate the combined effects of risk factors, a joint population attributable fraction is calculated, as described in Ezzati et al (2003).

The mortality associated with household and ambient air pollution was estimated based on the calculation of the joint population attributable fractions assuming independently distributed exposures and independent hazards as described in (Ezzati et al, 2003).

The joint population attributable fraction (PAF) were calculated using the following formula:
PAF=1-PRODUCT (1-PAFi)
where PAFi is PAF of individual risk factors.

The PAF for ambient air pollution and the PAF for household air pollution were assessed separately, based on the Comparative Risk Assessment (Ezzati et al, 2002) and expert groups for the Global Burden of Disease (GBD) 2010 study (Lim et al, 2012; Smith et al, 2014).

For exposure to ambient air pollution, annual mean estimates of particulate matter of a diameter of less than 2.5 um (PM2.5) were modelled as described in (WHO 2016, forthcoming), or for Indicator 11.6.2.

PAF=SUM(Pi(RR-1)/(SUM(RR-1)+1)

where i is the level of PM2.5 in ug/m3, and Pi is the percentage of the population exposed to that level of air pollution, and RR is the relative risk.

The calculations for household air pollution are similar and are explained in detailed elsewhere (WHO 2014a).
Exposure: Indicator 7.1.2 was used as exposure indicator for household air pollution.

Annual mean concentration of particulate matter of less than 2.5 um was used as exposure indicator for ambient air pollution. The data is modelled according to methods described for Indicator 11.6.2.

Exposure-risk function: The integrated exposure-response functions (IER) developed for the GBD 2010 (Burnett et al, 2014) and further updated for the GBD 2013 study (Forouzanfar et al, 2015) were used.

Health data: The total number of deaths by disease, country, sex and age group have been developed by the World Health Organization (WHO 2014b).

Disaggregation:
The data is available by country, by sex, by disease, and by age.

Treatment of missing values:

- At country level

  Countries with no data are reported as blank.

- At regional and global levels

  Countries with no data are not reported in the regional and global averages.

Regional aggregates:

Number of deaths by country is summed and divided by the population of countries included in the region (regional aggregates) or by the total population (global aggregates).

Sources of discrepancies:

Underlying differences between country produced and internationally estimated data may due to:
- Different exposure data (annual mean concentration of particulate matter of less than 2.5 um of diameter, proportion of population using clean fuels and technology for cooking)
- Different exposure-risk estimates
- Different underlying mortality data

Data Sources

Data Availability

Data is available by country, sex, disease and age.

Data providers

Cities could request this data from ministry of health and ministry of environment.

Data compiler
WHO

References

www.who.int/gho/phe

Bonjour et al (2013). Environ Health Perspect, doi:10.1289/ehp.1205987.

Burnett et al (2014). Environ Health Perspect, Vol 122, Issue 4.

Ezzati et al (2003). The Lancet, 362:271-80.

Ezzati et al (2002). The Lancet. 360(9343):1347-60.

Forouzanfar et al (2015). The Lancet, 386:2287-323.

Lim et al (2012). The Lancet, 380(9859):2224-60.

Smith et al (2014). Annu.Rev.Public Health, Vol 35.

WHO (2014a). Methods description for the burden of disease attributable to household air pollution. Access at : http://www.who.int/phe/health_topics/outdoorair/database/HAP_BoD_methods_March2014.pdf?ua=1

WHO (2014b). Global Health Estimates 2013: Deaths by Cause, Age and Sex, by Country, 2000-2012 (provisional estimates). Geneva, World Health Organization, 2014.

WHO (2016). Air pollution: a global assessment of exposure and burden of disease, WHO Geneva.

4: Women's recognized legal right to property inheritance and ownership

Definition:

Research shows that many women farmers and entrepreneurs are less productive than men because they have more limited access to and control of economic resources, including land. Women are as productive as men when they access the same productive resources as men. Hence, women's access and control of land is crucial for achieving gender equality. Member States agreed to advocate for security of tenure for all while recognizing the many different tenure types (NUA §35).

4 "Proportion of countries where the legal framework (including customary law) guarantees women's equal rights to land ownership and/or control" is SDG-5.a.2

Rationale:

This indicator is process indicator that monitors reforms in the legal and policy framework that support women's rights to land ownership and control in both urban and rural areas. In the New Urban Agenda, Member States committed themselves to promoting, at the appropriate level of government increased security of tenure for all, permitting a continuum of land and property rights, and recognizing that security of land tenure for women as key to their empowerment, and setting up effective administrative systems (NUA §35).

Disaggregation:

Statistical data on land ownership should be disaggregated by sex, so as to facilitate measurement of progress on effectiveness of the legal framework on women's equal rights to land.

Methodology:

SDG-5.a.2 "Proportion of countries where the legal framework (including customary law) guarantees women's equal rights to land ownership and/or control." As indicator 5.a.2 is not directly measurable, six proxies have been identified to assess progress under indicator 5.a.2. [21]

• Proxy A: Is the joint registration of land compulsory or encouraged through economic incentives?

• Proxy B: Does the legal and policy framework require spousal consent for land transactions?

• Proxy C: Does the legal and policy framework support women's and girls' equal inheritance rights?

• Proxy D: Does the legal and policy framework provide for the allocation of financial resources to increase women's ownership and control over land?

[21] Reference www.fao.org/3/I8785EN/i8785EN.pdf

• Proxy E: In legal systems that recognize customary land tenure, does the legal and policy framework explicitly protect the land rights of women?

• Proxy F: Does the legal and policy framework mandate women's participation in land management and administration institutions?

Collectively, these proxies will track progress under indicator 5.a.2 based on good practices included in national legal frameworks. These proxies will assist to tackle the main constraints and gender biases that women face ensure their security their land rights.

Reporting process for indicator 5.a.2

1. National governments should identify a national entity and legal expert that will be responsible for collection of data, usually the Ministry of Land or national agencies responsible for land matters or the Ministry of Justice.
2. Identify a national legal expert to conduct 5.a.2 legal assessment for indicator. The national expert should be knowledgeable in matters regarding property rights in his or her country and have good legal research skills.
3. The national legal expert should conduct a survey every two years to identify the legal and policy framework for each proxy is found providing appropriate reference for the legal and policy framework. The survey contains three forms:
    - **Form 1 "Checklist of policy and legal instruments."** This form provides a checklist of the relevant policy and legal instruments for each proxy.
    - **Form 2 "List of policy and legal instruments for reporting under indicator 5.a.2."** This form is where the details of instruments containing the Proxy are provided and relevant provisions cited.
    - **Form 3 "Questionnaire on indicator 5.a.2."** This form summarizes the results of the assessment for each proxy.
4. The results of the assessment and computing will be checked and validated by the responsible entity, prior to communication to FAO. It is recommended that this is a transparent process, open to the participation of civil society and a cross-section of government institutions.
5. After checking survey results communicate the results to FAO

Data Sources:

Policies, Primary law, and secondary legislation. Any legal or policy provision must be publicly available.

References

FAO, "Realizing women's rights to land in the law: A guide for reporting on SDG indicator 5.a.2", www.fao.org/3/I8785EN/i8785EN.pdf

5: Proportion of population using safely managed drinking water services

Definition:

The percentage of the population that is using an improved drinking water source that is protected from chemical and faecal contamination. Improved drinking water sources include: piped water into dwelling, yard or plot; public taps or standpipes; boreholes or tubewells; protected dug wells; protected springs; bottled water; delivered water and rainwater.

Rationale:

The aim is to determine the portion of the population with "sustainable access" to "safe drinking water". The indicator also addresses dimensions accessibility, availability and quality. Water is essential for human life and well-being. Safe water reduces the incidence of disease. Safe drinking water reduces the incidence of diarrhea and deaths due to diarrhea. In addition, the water has to be affordable to households, enough for every household member and available without too much physical exertion and time[22].

The New Urban Agenda envisions progressive realization of the right to adequate housing, a major part of which is universal access to safe and affordable drinking water (NUA §13). In this regard, they committed themselves to ensure universal and equitable access to safe and affordable drinking water for all (NUA §119).

Data sources:

Data on drinking water sources is available from household surveys such as Demographic Health Survey, MICS etc. WHO/UNICEF Joint Monitoring Program collect data from countries which is available at www.washdata.org . JMP estimates access to basic services for urban and rural areas separately for each country. Sometimes JMP estimates differ from national estimates. This is usually due to differences in indicator definitions.

UNHABITAT utilizes JMP data and encourages production of city level estimates to facilitate city level analysis and policy formulation.

Disaggregation:

For purposes of monitoring the New Urban Agenda disaggregate by urban/rural and city level and income level if possible.

Reference:

The metadata is from https://unstats.un.org/sdgs/metadata/ , but it has been shortened.

UNHABITAT, "Urban Indicator Guidelines", July 2009

[22] UNHABITAT, "Urban Indicator Guidelines", July 2009

6: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

Definition:

The Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water is the percentage of the population using a basic sanitation facility which is not shared with other households and where excreta is safely disposed in the original place or treated off-site. 'Improved' sanitation facilities include: flush or pour flush toilets to sewer systems, septic tanks or pit latrines, ventilated improved pit latrines, pit latrines with a slab, and composting toilets[23].

Rationale:

The aim is to determine the portion of the population with "sustainable access" to "basic sanitation". Improved sanitation facilities make human contact with excreta unlikely and substantially reduces the incidence of diarrhoea. In May 2017, the World Health Organization estimated that each year each year there were nearly 1.7 billion cases diarrhoea among children under five kills and around 525 000 were fatal. A significant proportion of diarrhoeal disease can be prevented through safe drinking-water and adequate sanitation and hygiene[24]. The indicator also addresses dimensions accessibility, availability and quality. The indicator takes into account safe management of faecal waste and discharge of untreated wastewater. Handwashing is an important factor in reducing spread of diseases. During surveys enumerators should watch for availability of water and soap at handwashing locations.

The New Urban Agenda envisages progressive realization of the right to adequate housing, one of the criteria for which is access to improved sanitation (NUA §13). In this regard, they committed themselves to promote adequate investments in protective, accessible and sustainable infrastructure and service provision systems for sanitation (NUA §119).

Data sources:

Data on sanitation is available from household surveys such as Demographic Health Survey, MICS etc. WHO/UNICEF Joint Monitoring Program collect data from countries which is available at www.washdata.org . JMP estimates access to basic services for urban and rural areas separately for each country. Sometimes JMP estimates differ from national estimates. This is usually due to differences in indicator definitions. Data is collected every even year and published the following year.

Disaggregation:

For purposes of monitoring the New Urban Agenda disaggregate by urban/rural and city level and income level if possible.

UNHABITAT utilizes JMP data and encourages production of city level estimates to facilitate city level analysis and policy formulation.

Reference:

https://unstats.un.org/sdgs/metadata/

WHO, "Diarrhoeal disease", https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease

[23] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened.

[24] https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease

7: Renewable energy share in the total final energy consumption

Definition:

The renewable energy share in total final consumption is the percentage of final consumption of energy that is derived from renewable resources[25].

Rationale:

This indicator will monitor progress under the "Guidelines for Implementing the new Urban Agenda" theme "Access to basic services" and the category 1.1.3.3 "Access to modern renewable energy". Member States committed to ensuring universal access to affordable, reliable and modern energy services by promoting energy efficiency and sustainable renewable energy and supporting subnational and local efforts to utilize renewable energy in public buildings, as well as advance its use in residential buildings by mandating installation in building codes (NUA §121).

The target "By 2030, increase substantially the share of renewable energy in the global energy mix" impacts all three dimensions of sustainable development. Renewable energy technologies represent a major element in strategies for greening economies everywhere in the world and for tackling the critical global problem of climate change. A number of definitions of renewable energy exist; what they have in common is highlighting as renewable all forms of energy that their consumption does not deplete their availability in the future. These include solar, wind, ocean, hydropower, geothermal resources, and bioenergy (in the case of bioenergy, which can be depleted, sources of bioenergy can be replaced within a short to medium-term frame). Importantly, this indicator focuses on the amount of renewable energy actually consumed rather than the capacity for renewable energy production, which cannot always be fully utilized. By focusing on consumption by the end user, it avoids the distortions caused by the fact that conventional energy sources are subject to significant energy losses along the production chain.

Concepts:

Renewable energy consumption includes consumption of energy derived from: hydro, solid biofuels, wind, solar, liquid biofuels, biogas, geothermal, marine and waste. Total final energy consumption is calculated from national balances and statistics as total final consumption minus non-energy use.

Comments with regard to specific renewable energy resources:

- Solar energy consumption includes solar PV and solar thermal
- Liquid biofuel energy consumption includes biogasoline, biodiesels and other liquid biofuels
- Solid biofuel consumption includes fuelwood, animal waste, vegetable waste, black liquor, bagasse and charcoal
- Waste energy covers energy from renewable municipal waste

Comments and limitations:

- A limitation with existing renewable energy statistics is that they are not able to distinguish whether renewable energy is being sustainably produced. For example, a substantial share of today's renewable energy consumption comes from the use of wood and charcoal by households in the developing world, which

[25] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened.

sometimes may be associated with unsustainable forestry practices. There are efforts underway to improve the ability to measure the sustainability of bio-energy, although this remains a significant challenge.

- Off-grid renewables data are limited and not sufficiently captured in the energy statistics
- The method of allocation of renewable energy consumption from electricity and heat output assumes that the share of transmission and distribution losses are the same between all technologies. However, this is not always true because renewables are usually located in more remote areas from consumption centers and may incur larger losses.
- Likewise, imports and exports of electricity and heat are assumed to follow the share of renewability of electricity and heat generation, respectively. This is a simplification that in many cases will not affect the indicator too much, but that might do so in some cases, for example, when a country only generates electricity from fossil fuels but imports a great share of the electricity it uses from a neighboring country's hydroelectric power plant.
- Methodological challenges associated with defining and measuring renewable energy are more fully described the Global Tracking Framework (IEA and World Bank, 2013) Chapter 4, Section 1, page 194-200. Data for traditional use of solid biofuels are generally scarce globally, and developing capacity in tracking such energy use, including developing national level surveys, is essential for sound global energy tracking.

Methodology

Computation Method:

This indicator is based on the development of comprehensive energy statistics across supply and demand for all energy sources – statistics used to produce a national energy balance. Internationally agreed methodologies for energy statistics are described in the "International Recommendations on Energy Statistics" (IRES), adopted by the UN Statistical Commission, available at: https://unstats.un.org/unsd/energy/ires/.

Once a national energy balance is developed, the indicator can be calculated by dividing final energy consumption from all renewable sources by total final energy consumption. Renewable energy consumption is derived from three tables of the IEA world energy statistics and balances: total final consumption, electricity output and heat output. All volumes reported in the total final consumption table are taken as reported. Since volumes for electricity and heat in the final consumption table are not broken down by technology, electricity and heat output tables are used instead to break down final consumption of electricity and heat by technology. The allocation by technology is done by deriving the share of technology in electricity and heat output tables and multiplying that share by final energy consumption of electricity and heat, respectively. For instance, if total final consumption table reports 150 TJ for biogas energy, while total final consumption of electricity is 400 TJ and heat 100 TJ, and the share of biogas in total electricity output is 10 percent and 5 percent in heat, the total reported number for biogas consumption will be 195 TJ (150 TJ+400TJ*10%+100TJ*5%). The Global Tracking Framework Report (IEA and World Bank, 2013) provides more details on the suggested methodology for defining and measuring renewable energy (Chapter 4, Section 1, page 201-202). UNSD follows the same methodology to compute the indicators, though information may come from different tables.

Disaggregation:

Disaggregation of the data on consumption of renewable energy, e.g. by resource and end-use sector, could provide insights into other dimensions of the goal, such as affordability and reliability. For solar energy, it may also be of interest to disaggregate between grid and off-grid capacity.

Regional aggregates:

Aggregates are calculated, whether by region or global, using final energy consumption as weights.

Data Sources

Data on renewable energy consumption are available through national Energy Balances compiled based on data collected by the International Energy Agency (for around 150 countries) and the United Nations Statistics Division (UNSD) for all - countries. The energy balances make it possible to trace all the different sources and uses of energy at the national level.

Some technical assistance may be needed to improve these statistics, particularly in the case of renewable energy sources. Specialized industry surveys (e.g. on bioenergy use) or household surveys (in combination with the measurement of other indicators) would be feasible approaches to filling in data gaps (e.g. for use of firewood, off-grid solar energy).

Data Availability

Description:

Between the various existing data sources, primarily the IEA Energy Balances and the UN Energy Statistics Database, annual total and renewable energy consumption for every country and area can be collected. The *Tracking SDG7: The Energy Progress Report* (formerly *Sustainable Energy for All Global Tracking Framework*) is reporting this indicator at a global level between 2010 and 2030.

Time series:

1990-present

Calendar

Data collection:

Data are collected on an annual basis.

Data release:

The IEA Energy Balances are published in summer (publishing information for two calendar years prior). The UN energy balances are made available towards the end of the calendar year (publishing information for two calendar years prior)

Data providers

National administrations, as described in documentation on sources for IEA and UNSD:
http://wds.iea.org/wds/pdf/WORLDBAL_Documentation.pdf
https://unstats.un.org/unsd/energy/edbase.htm

Data compilers

The International Energy Agency (IEA) and the United Nations Statistics Division (UNSD)

Description:

The IEA and UNSD are the primary compilers of national energy statistics and develop internationally comparable energy balances based on internationally agreed methodologies. Aggregates are based on analysis merging of IEA and UNSD data.

References

URL:
iea.org; unstats.un.org/unsd/energy

References:

IEA Energy Balances and Statistics
http://www.iea.org/statistics/

UN Energy Statistics Database http://unstats.un.org/unsd/energy/edbase.htm (description) and http://data.un.org/Explorer.aspx?d=EDATA (data)

IEA SDG 7 webpage: http://www.iea.org/sdg

International Recommendations on Energy Statistics (IRES) https://unstats.un.org/unsd/energy/ires/

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International Energy Agency (IEA) and the World Bank. 2013. "Global Tracking Framework 2013"

IRENA Renewable Energy Database
http://resourceirena.irena.org/gateway/dashboard

8: Annual growth rate of real GDP per employed person

Definition:
Annual growth rate of real GDP per employed person conveys the annual percentage change in real Gross Domestic Product per employed person.

Rationale:
The real GDP per employed person being a measure of labour productivity, this indicator represents a measure of labour productivity growth, thus providing information on the evolution, efficiency and quality of human capital in the production process.

Economic growth in a country can be ascribed either to increased employment or to more effective work by those who are employed. This indicator casts light on the latter effect, being therefore a key measure of economic performance. Labour productivity (and growth) estimates can support the formulation of labour market policies and monitor their effects. They can also contribute to the understanding of how labour market performance affects living standards.

Comments and limitations:
Output measures are obtained from national accounts and represent, as much as possible, GDP at market prices for the aggregate economy. However, despite common principles that are mostly based on the United Nations System of National Accounts, there are still significant problems in international consistency of national accounts estimates, based on factors such as differences in the treatment of output in services sectors, differences in methods used to correct output measures for price changes (in particular, the use of different weighting systems to obtain deflators) and differences in the degree of coverage of informal economic activities.

Data on employment used in the denominator of this indicator refer, as much as possible, to the average number of persons with one or more paid jobs during the year. That is, the reliability of the employment data is also dependent on the degree of coverage of informal activities by the statistical source used.

Methodology

Computation Method:

$$\text{Real GDP per employed person} = \frac{\text{GDP at constant prices}}{\text{Total employment}}$$

The numerator and denominator of the equation above should refer to the same reference period, for example, the same calendar year.

If we call the real GDP per employed person “LabProd”, then the annual growth rate of real GDP per employed person is calculated as follows:

$$\text{Annual growth rate of real GDP per employed person} = \frac{(\text{LabProd in year n}) - (\text{LabProd in year n} - 1)}{(\text{LabProd in year n} - 1)} \times 100$$

Disaggregation:

- Disaggregation by city/urban level

Treatment of missing values:

- At country level
  Multivariate regression techniques are used to impute missing employment values at the country level. For a detailed description of the methodology used, please refer to Trends Econometric Models: A Review of Methodology (ILO, Geneva, 2010), available at http://www.ilo.org/empelm/pubs/WCMS_120382/lang--en/index.htm.

- At regional and global levels

Regional aggregates:
To address the problem of missing data, the ILO designed several econometric models which are used to produce estimates of labour market indicators in the countries and years for which real data are not available. The employment data derived from the Trends Econometric Models (TEM) are used to produce estimates on labour productivity. These models use multivariate regression techniques to impute missing values at the country level, which are then aggregated to produce regional and global estimates. For further information on the TEM, please refer to the technical background papers available at: http://www.ilo.org/empelm/projects/WCMS_114246/lang--en/index.htm.

Sources of discrepancies:

Methods and guidance available to countries for the compilation of the data at the national level:
See:

- Estimates and projections of labour market indicators (http://www.ilo.org/empelm/projects/WCMS_114246/lang--en/index.htm)
- ILO Guidebook - Decent Work and the Sustainable Development Goals: A Guidebook on SDG Labour Market Indicators (https://www.ilo.org/stat/Publications/WCMS_647109/lang--en/index.htm)
- ILO Manual – Decent Work Indicators, Concepts and Definitions – Chapter 1, Economic and social context for decent work http://www.ilo.org/integration/resources/pubs/WCMS_229374/lang--en/index.htm (second version, page 214)
- Resolution concerning statistics of work, employment and labour underutilization http://www.ilo.ch/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-by-international-conferences-of-labour-statisticians/WCMS_230304/lang--en/index.htm
- System of National Accounts 2008 http://unstats.un.org/unsd/nationalaccount/sna2008.asp
- Trends Econometric Models: A Review of Methodology http://www.ilo.org/empelm/pubs/WCMS_120382/lang--en/index.htm
- ILOSTAT Database (www.ilo.org/ilostat)
- ILOSTAT Database – Metadata – Indicator Descriptions (Labour productivity, at: http://www.ilo.org/ilostat-files/Documents/description_PRODY_EN.pdf).

Data Sources

Description:

Output measures used in the numerator of this indicator (Gross Domestic Product) are best obtained from the production side of national accounts and represent, as much as possible, GDP at market prices for the aggregate economy (adjusted for inflation, in constant prices).

Employment data used in the denominator are preferably derived from labour force or other household surveys with an employment module. In the absence of a household survey, establishment surveys, administrative records or official estimates based on reliable sources can be used as well as population censuses. It is however important to note that employment data from establishment surveys will capture the number of jobs and not the number of persons employed as preferred for the denominator. Also, establishment surveys cover, in many cases, the formal sector and employers and employees only, not accounting for the whole economy.

When calculating this indicator, it is important to ensure that the coverage of the employment data is consistent with that of the national accounts.

Collection process:
For the purposes of international reporting on the SDG indicators, the ILO uses country-level estimates of GDP in constant 2010 US$ from the World Bank's World Development Indicators database and country-level estimates on employment from household surveys or derived from the ILO's TEM to calculate levels and growth rates of labour productivity at the country, regional and global levels.

Data Availability

Description:

Time series:
Data for this indicator is available as of 2000 in the SDG Indicators Global Database, but time series going back to 1991 and including projections up to 2022 are available in ILOSTAT.

Calendar

Data collection:

Data release:
ILO estimates of labour productivity are part of the ILO Estimates and Projections series, analysed in the ILO's World Employment and Social Outlook reports. Both the underlying ILO estimates and the WESO are released twice a year (May and January).

Data providers

National Statistical Offices, and in some cases Labour Ministries or other related agencies.

Data compilers

ILO.

- ILO Guidebook - Decent Work and the Sustainable Development Goals: A Guidebook on SDG Labour Market Indicators (https://www.ilo.org/stat/Publications/WCMS_647109/lang--en/index.htm)
- Estimates and projections of labour market indicators (http://www.ilo.org/empelm/projects/WCMS_114246/lang--en/index.htm)

ILO Manual – Decent Work Indicators, Concepts and Definitions – Chapter 1, Economic and social context for decent work http://www.ilo.org/integration/resources/pubs/WCMS_229374/lang--en/index.htm (second version, page 2149)
- Resolution concerning statistics of work, employment and labour underutilization http://www.ilo.ch/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-by-international-conferences-of-labour-statisticians/WCMS_230304/lang--en/index.htm
- System of National Accounts 2008 http://unstats.un.org/unsd/nationalaccount/sna2008.asp
- Trends Econometric Models: A Review of Methodology http://www.ilo.org/empelm/pubs/WCMS_120382/lang--en/index.htm
- ILOSTAT Database (www.ilo.org/ilostat)
- ILOSTAT Database – Metadata – Indicator Descriptions (Labour productivity, at: http://www.ilo.org/ilostat-files/Documents/description_PRODY_EN.pdf).

9: Proportion of informal employment in non-agriculture employment, by sex

Definition:
This indicator presents the share of non-agricultural employment that is informal[26].

Rationale:
This indicator will monitor progress under the theme "Inclusive Urban Economy" in the Guidelines for Implementing the New Urban Agenda" under the category 1.2.1.2 "Support the informal Economy". One of the commitments in the New Urban Agenda was to recognize the contribution of the working poor in the informal economy, particularly women, and gradually transition of workers and economic units from the informal to the formal economy by combining incentives and compliance measures, while ensuring preservation and improvement of existing livelihoods (NUA §59).

In contexts where social protection coverage is limited, social security benefits (such as unemployment insurance) are insufficient or even inexistent, and/or where wages and pensions are low, individuals may have to take up informal employment to ensure their livelihood. In these situations, indicators such as the unemployment rate would provide a very incomplete picture of the labour market situation, overlooking major deficits in the quality of employment. Statistics on informality are key to assessing the quality of employment in an economy, and are relevant to developing and developed countries alike (ILOSTAT indicator description for informality, available at http://www.ilo.org/ilostatfiles/Documents/description_IFL_EN.pdf).

Concepts:
Employment comprises all persons of working age who during a specified brief period, such as one week or one day, performed work for others in exchange for pay or profit.

Informal employment comprises persons who in their main or secondary jobs were in one of the following categories:
- Own-account workers, employers and members of producers' cooperatives employed in their own informal sector enterprises (the characteristics of the enterprise determine the informal nature of their jobs);
- Own-account workers engaged in the production of goods exclusively for own final use by their household (e.g. subsistence farming);
- Contributing family workers, regardless of whether they work in formal or informal sector enterprises (they usually do not have explicit, written contracts of employment, and are not subject to labour legislation, social security regulations, collective agreements, etc., which determines the informal nature of their jobs);
- Employees holding informal jobs, whether employed by formal sector enterprises, informal sector enterprises, or as paid domestic workers by households (employees are considered to have informal jobs if their employment relationship is, in law or in practice, not subject to national labour legislation, income taxation, social protection or entitlement to certain employment benefits).

An enterprise belongs to the informal sector if it fulfils the three following conditions:
- It is an unincorporated enterprise (it is not constituted as a legal entity separate from its owners, and it is owned and controlled by one or more members of one or more households, and it is not a quasi-corporation: it does not have a complete set of accounts, including balance sheets);

[26] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened.

- It is a market enterprise (it sells at least some of the goods or services it produces);
- The enterprise is not registered or the employees of the enterprise are not registered or the number of persons engaged on a continuous basis is below a threshold determined by the country.

Comments and limitations:
The considerable heterogeneity of definitions and operational criteria used by countries to measure informal employment greatly hinders the international comparability of statistics on informality.
Also, the scope of this indicator is limited to non-agriculture. However, to have a comprehensive picture of the importance of informality in the economy and to better understand its patterns, statistics on informal employment should be produced and analysed for both agricultural and non-agricultural activities.

Methodology

Computation Method:

$$\text{Proportion of informal employment in non agricultural employment} = \frac{\text{Informal employment in non agricultural activities}}{\text{Total employment in non agricultural activities}} \times 100$$

Disaggregation:
Data on this indicator is requested disaggregated by sex, and by city and urban levels.
In order to produce this indicator, employment statistics disaggregated by formal / informal employment and by economic activity (agriculture / industry / services) are needed.

Treatment of missing values:

- At country level
- At regional and global levels

Methods and guidance available to countries for the compilation of the data at the national level:
- ILO Guidebook - Decent Work and the Sustainable Development Goals: A Guidebook on SDG Labour Market Indicators (https://www.ilo.org/stat/Publications/WCMS_647109/lang--en/index.htm)
- Resolution concerning statistics of employment in the informal sector, adopted by the Fifteenth International Conference of Labour Statisticians (January 1993), available at http://ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-byinternational-conferences-of-labour-statisticians/WCMS_087484/lang--en/index.htm
- Guidelines concerning a statistical definition of informal employment, adopted by the Seventieth International Conference of Labour Statisticians (November-December 2003) available at http://ilo.org/global/statistics-and-databases/standards-and-guidelines/guidelines-adopted-byinternational-conferences-of-labour-statisticians/WCMS_087622/lang--en/index.htm
- ILO manual Measuring informality: A statistical manual on the informal sector and informal employment available at http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_222979.pdf

Quality assurance

With a view to ensuring data quality and reliability, and especially cross-country comparability, the ILO derives statistics on informal employment based on a standard definition and standard operational criteria through processing microdata sets from household surveys.
Thanks to this exercise, two series of indicators on informality are disseminated in the ILO's central statistical database, ILOSTAT (www.ilo.org/ilostat): one referring to the statistics produced and reported by countries, and another based on ILO's standard criteria (harmonized).
For the purposes of international reporting on the SDG indicators, both series are used (the country-reported estimates of informal employment are submitted alongside the ILO harmonized estimates of informal employment).

Data Sources

Description:
The preferred source of data for this indicator is a labour force survey, with sufficient questions to determine the informal nature of jobs and whether the establishment where the person works in belongs to the formal or the informal sector.

Collection process:
The ILO Department of Statistics sends out its annual questionnaire on labour statistics to all relevant agencies within each country (national statistical office, labour ministry, etc.) requesting for the latest annual data available and any revisions on numerous labour market topics and indicators, including many SDG indicators. Indicator 8.3.1 is calculated from statistics submitted to the ILO Department of
Statistics via this questionnaire as well as through special agreements with regional and national statistical offices or through the processing of microdata sets of national labour force surveys.

Data Availability

Both country-reported estimates and ILO harmonized estimates of informal employment are available in ILOSTAT (www.ilo.org/ilostat).

Data collection:
The ILO Department of Statistics sends out its annual questionnaire on labour statistics usually in the 2nd quarter, with a view to receiving the requested statistics by the 3rd quarter or the end of the year at the latest. Data received in batch from regional and national statistical offices and data obtained through the processing of microdata sets of national labour force surveys by the ILO Department of Statistics are continuously updated in ILOSTAT (as they become available to the ILO Department of Statistics).

Data release:
The ILO Department of Statistics' online database ILOSTAT is continuously updated to reflect statistics compiled and processed every week.

Data providers

Mainly National Statistical Offices.

Data compilers

ILO

Disaggregation:

For purposes of monitoring the New Urban Agenda disaggregate by urban/rural and city level if possible.

References

1. ILO Guidebook - Decent Work and the Sustainable Development Goals: A Guidebook on SDG Labour Market Indicators (https://www.ilo.org/stat/Publications/WCMS_647109/lang--en/index.htm)

2. Resolution concerning statistics of employment in the informal sector, adopted by the Fifteenth International Conference of Labour Statisticians (January 1993), available at http://ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-byinternational-conferences-of-labour-statisticians/WCMS_087484/lang--en/index.htm

3. Guidelines concerning a statistical definition of informal employment, adopted by the Seventieth International Conference of Labour Statisticians (November-December 2003) available at http://ilo.org/global/statistics-and-databases/standards-and-guidelines/guidelines-adopted-byinternational-conferences-of-labour-statisticians/WCMS_087622/lang--en/index.htm

4. ILO manual Measuring informality: A statistical manual on the informal sector and informal employment, available at http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_222979.pdf

5. ILOSTAT's indicator description on informality, at http://www.ilo.org/ilostatfiles/Documents/description_IFL_EN.pdf

6. Resolution concerning statistics of work, employment and labour underutilization adopted by the Nineteenth International Conference of Labour Statisticians (October 2013), available at http://ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-byinternational-conferences-of-labour-statisticians/WCMS_230304/lang--en/index.htm

7. International Standard Industrial Classification of All Economic Activities (ISIC Rev.4) https://unstats.un.org/unsd/cr/registry/isic-4.asp

10: Unemployment rate, by sex, age, persons with disabilities and by city

Definition:
The unemployment rate conveys the percentage of persons in the labour force who are unemployed.

Rationale:
The unemployment rate is a useful measure of the underutilization of the labour supply. It reflects the inability of an economy to generate employment for those persons who want to work but are not doing so, even though they are available for employment and actively seeking work. It is thus seen as an indicator of the efficiency and effectiveness of an economy to absorb its labour force and of the performance of the labour market. Short-term time series of the unemployment rate can be used to signal changes in the business cycle; upward movements in the indicator often coincide with recessionary periods or in some cases with the beginning of an expansionary period as persons previously not in the labour market begin to test conditions through an active job search.

Comments and limitations:
Even though in most developed countries the unemployment rate continues to prove its usefulness as an important indicator of labour market performance, and specifically, as a key measure of labour underutilization, in many developing countries, however, the significance and meaning of the unemployment rate could be questioned. In the absence of unemployment insurance systems or social safety nets, persons of working age must avoid unemployment, resorting to engaging in some form of economic activity, however insignificant or inadequate. Thus, in this context, other measures should supplement the unemployment rate to comprehensively assess labour underutilization.

Methodology

Computation Method:

$$\text{Unemployment rate} = \frac{\text{Total unemployment}}{\text{Total labour force}} \times 100$$

Disaggregation:
-Disaggregation by sex
- Disaggregation by age group
- Disaggregation by disability status
Disaggregation by city/urban level.

Treatment of missing values:

- At country level
  Multivariate regression techniques are used to impute missing values at the country level. However, the imputed missing country values are only used to calculate the global and regional estimates; they are not used for international reporting on the SDG indicators by the ILO.
  For a more detailed methodological description, please refer to Trends Econometric Models: A Review of Methodology (ILO, Geneva, 2010), available at http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_elm/---trends/documents/publication/wcms_120382.pdf .

- At regional and global levels

Regional aggregates:

To address the problem of missing data, the ILO designed several econometric models which are used to produce estimates of labour market indicators in the countries and years for which real data are not available. The unemployment estimates derived from the Trends Econometric Models (TEM) are used to produce global and regional estimates on unemployment rates. These models use multivariate regression techniques to impute missing values at the country level, which are then aggregated to produce regional and global estimates. For further information on the TEM, please refer to the technical background papers available at: http://www.ilo.org/empelm/projects/WCMS_114246/lang--en/index.htm.

Sources of discrepancies:

Methods and guidance available to countries for the compilation of the data at the national level:

In order to calculate this indicator (according to the ILO definitions of unemployment and unemployment rate), data is needed on both the labour force and the unemployed, by sex and age (and eventually disability status). This data is collected at the national level mainly through labour force surveys (or other types of household surveys with an employment module). For the methodology of each national household survey, one must refer to the most comprehensive survey report or to the methodological publications of the national statistical office in question.

- Decent Work and the Sustainable Development Goals: A Guidebook on SDG Labour Market Indicators, available at https://www.ilo.org/stat/Publications/WCMS_647109/lang--en/index.htm
- ILO Manual – Decent Work Indicators, Concepts and Definitions – Chapter 1, Employment opportunities http://www.ilo.org/integration/resources/pubs/WCMS_229374/lang--en/index.htm (second version, pages 34 and 49)
- Resolution concerning statistics of work, employment and labour underutilization

http://www.ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adoptedby-international-conferences-of-labour-statisticians/WCMS_230304/lang--en/index.htm

- ILOSTAT (www.ilo.org/ilostat)
- ILOSTAT Metadata – Indicator descriptions (http://www.ilo.org/ilostat-files/Documents/description_UR_EN.pdf)

Quality assurance

Data consistency and quality checks regularly conducted for validation of the data before dissemination in the ILOSTAT database.

In many cases, data reported to the ILO Department of Statistics through its annual questionnaire on labour statistics, by national statistical offices or other relevant national agencies. Data also received in other cases through agreements between the ILO Department of Statistics and regional or national statistical agencies or obtained through ILO processing of microdata sets of national household surveys. The primary source of the data as well as the repository where applicable are indicated in the relevant metadata and/or footnotes in ILOSTAT and in the SDG Indicators Global Database.

Data Sources

Description:

The preferred official national data source for this indicator is a household-based labour force survey.

In the absence of a labour force survey, a population census and/or other type of household surveys with an appropriate employment module may also be used to obtain the required data.

It is important to note that unemployment data derived from employment office records or unemployment registers would not refer to unemployment (as defined for the purposes of this indicator, using the three-criteria of being without a job, seeking employment and available for employment) but to registered unemployment, and thus, it would not be comparable with indicator 8.5.2.

Collection process:
The ILO Department of Statistics sends out its annual questionnaire on labour statistics to all relevant agencies within each country (national statistical office, labour ministry, etc.) requesting for the latest annual data available and any revisions on numerous labour market topics and indicators, including many SDG indicators. Indicator 8.5.2 is calculated from statistics submitted to the ILO Department of Statistics via this questionnaire as well as through special agreements with regional and national statistical offices or through the processing of microdata sets of national labour force surveys.

Data Availability

Description:
The indicator is widely available based on real observations provided by countries and derived from national labour force surveys, other types of household surveys or population census.

However, the disaggregation by disability is not widely available. It is increasingly reported but coverage is still very low.

Time series:
Data for this indicator is available as of 2000 in the SDG Indicators Global Database, but time series going back several decades are available in ILOSTAT.

Calendar

Data collection:
The ILO Department of Statistics sends out its annual questionnaire on labour statistics, usually in the 2nd quarter, with a view to receiving the requested statistics by the 3rd quarter or the end of the year at the latest. Data received in batch from regional and national statistical offices and data obtained through the processing of microdata sets of national household surveys by the ILO Department of Statistics are continuously updated in ILOSTAT (as they become available to the ILO Department of Statistics).

Data release:
The ILO Department of Statistics' online database ILOSTAT is continuously updated to reflect statistics compiled and processed every week. In general, statistics for EUROSTAT and OECD countries are available around the 2nd or 3rd quarter of the year following the year of reference, whereas they are usually available around the 3rd or 4th quarter of the year following the year of reference for other countries.

Data providers

Mainly National Statistical Offices, and in some cases Labour Ministries or other related agencies, at the country-level. In some cases, regional or international statistical offices can also act as data providers.

- Decent Work and the Sustainable Development Goals: A Guidebook on SDG Labour Market Indicators, available at https://www.ilo.org/stat/Publications/WCMS_647109/lang--en/index.htm
- ILOSTAT database: www.ilo.org/ilostat
- ILOSTAT Metadata – Indicator Descriptions (http://www.ilo.org/ilostat-files/Documents/description_UR_EN.pdf)
- Decent Work Indicators Manual: http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_223121.pdf
- Resolution concerning statistics of work, employment and labour underutilization, adopted by the 19th ICLS in 2013: http://www.ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adoptedby-international-conferences-of-labour-statisticians/WCMS_230304/lang--en/index.htm

Trends Econometric Models: A Review of Methodology: http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_elm/---trends/documents/publication/wcms_120382.pdf

11: Proportion of youth (aged 15-24 years) not in education, employment or training

Definition:
This indicator measures the proportion of youth (aged 15-24 years) who are neither attending school nor college nor in employment nor undergoing any form of training.

Rationale:
The share of youth not in employment, education or training (youth NEET rate) provides a measure of youth who are outside the educational system, not in training and not in employment, and thus serves as a broader measure of potential youth labour market entrants than youth unemployment. It includes discouraged worker youth as well as those who are outside the labour force due to disability and engagement in household chores, among other reasons. NEET is also a better measure of the current universe of potential youth labour market entrants as compared with the youth inactivity rate, as the latter includes those youth who are outside the labour force and are in education, and thus are furthering their skills and qualifications.

Comments and limitations:
The calculation of this indicator requires to have reliable information on both the labour market status and the participation in education or training of young persons. The quality of such information is heavily dependent on the questionnaire design, the sample size and design and the accuracy of respondents' answers.
In terms of the analysis of the indicator, in order to avoid misinterpreting it, it is important to bear in mind that it is composed of two different sub-groups (unemployed youth not in education or training and youth outside the labour force not in education or training). The prevalence and composition of each sub-group would have policy implications, and thus, should also be considered when analysing the NEET rate.

Methodology

Computation Method:

$$\text{Youth NEET rate} = \frac{Youth - (Youth\ in\ employment + Youth\ not\ in\ employment\ but\ in\ education\ or\ training)}{Youth} \times 100$$

It is important to note here that youth simultaneously in employment and education or training should not be double counted when subtracted from the total number of youth.
The formula can also be expressed as:

$$\text{Youth NEET rate} = \frac{(Unemployed\ youth + Youth\ outside\ the\ LF) - (Unemployed\ youth\ in\ education\ or\ training + Youth\ outside\ the\ LF\ in\ education\ or\ training)}{Youth} \times 100$$

Where LF stands for labour force
Disaggregation:
-Disaggregation by sex
Disaggregation by city/urban level

Treatment of missing values:

- At country level
  Multivariate regression and cross-validation techniques are used to impute missing values at the country level. The additional variables used for the imputation include a range of indicators, including labour market and school enrolment data. However, the imputed missing country values are only used to calculate the global and regional estimates; they are not used for international reporting on the SDG indicators by the ILO.
  For a more detailed methodological description, please refer to Trends Econometric Models: A Review of Methodology (ILO, Geneva, 2010), available at http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_elm/---trends/documents/publication/wcms_120382.pdf .

- At regional and global levels

Regional aggregates:

The NEET aggregates are derived from the Trends Econometric Models (TEM) that are used to produce global and regional estimates of, amongst others, rates of youth not in employment. These models use multivariate regression and cross-validation techniques to impute missing values at the country level, which are then aggregated to produce regional and global estimates. The regional and global NEET rates are obtained by first adding up, across countries, the numerator and denominator of the formula that defines NEET rates - outlined above. Once both magnitudes are produced at the desired level of aggregation, the ratio between the two is used to produce the NEET rate for each regional grouping and the global level. Notice that this direct aggregation method can be used due to the imputation of missing observations. For further information on the TEM, please refer to the technical background papers available at: http://www.ilo.org/empelm/projects/WCMS_114246/lang--en/index.htm.

Sources of discrepancies:

Methods and guidance available to countries for the compilation of the data at the national level:

In order to calculate this indicator reliable data is needed on both the labour market situation and the participation in the educational system of the youth. This data is collected at the national level mainly through labour force surveys (or other types of household surveys with an employment module). For the methodology of each national household survey, one must refer to the most comprehensive survey report or to the methodological publications of the national statistical office in question.

- ILO Guidebook - Decent Work and the Sustainable Development Goals: A Guidebook on SDG Labour Market Indicators (https://www.ilo.org/stat/Publications/WCMS_647109/lang--en/index.htm)
- ILO Manual – Decent Work Indicators, Concepts and Definitions – Chapter 1, Employment opportunities http://www.ilo.org/integration/resources/pubs/WCMS_229374/lang--en/index.htm (second version, page 38)
- Resolution concerning statistics of work, employment and labour underutilization

http://www.ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adoptedby-international-conferences-of-labour-statisticians/WCMS_230304/lang--en/index.htm

- International Standard Classification of Education 2011 (ISCED-2011)

http://www.uis.unesco.org/Education/Pages/international-standard-classification-of-education.aspx

- ILOSTAT Metadata – Indicator Descriptions – Youth NEET rate
  http://www.ilo.org/ilostat-files/Documents/description_NEET_EN.pdf
- ILOSTAT (www.ilo.org/ilostat)

Quality assurance

Data consistency and quality checks regularly conducted for validation of the data before dissemination in the ILOSTAT database.

In many cases, data are reported to the ILO Department of Statistics through its annual questionnaire on labour statistics, by national statistical offices or other relevant national agencies. Data are also received in other cases through agreements between the ILO Department of Statistics and regional or national statistical agencies or obtained through ILO processing of microdata sets of national household surveys. The primary source of the data as well as the repository where applicable are indicated in the relevant metadata and/or footnotes in ILOSTAT and in the SDG Indicators Global Database.

Data Sources

Description:
The preferred official national data source for this indicator is a household-based labour force survey.
In the absence of a labour force survey, a population census and/or other type of household surveys with an appropriate employment module may also be used to obtain the required data.

Collection process:
The ILO Department of Statistics sends out its annual questionnaire on labour statistics to all relevant agencies within each country (national statistical office, labour ministry, etc.) requesting for the latest annual data available and any revisions on numerous labour market topics and indicators, including many SDG indicators. Indicator 8.6.1 is calculated from statistics submitted to the ILO Department of
Statistics via this questionnaire as well as through special agreements with regional and national statistical offices or through the processing of microdata sets of national labour force surveys.

Data Availability

Description:

Time series:
Data for this indicator is available as of 2000 in the SDG Indicators Global Database, but longer time series are available in ILOSTAT.

Calendar

Data collection:
The ILO Department of Statistics sends out its annual questionnaire on labour statistics, usually in the 2nd quarter, with a view to receiving the requested statistics by the 3rd quarter or the end of the year at the latest. Data received in batch from regional and national statistical offices and data obtained through the processing of microdata sets of national household surveys by the ILO Department of Statistics are continuously updated in ILOSTAT (as they become available to the ILO Department of Statistics).

Data release:
The ILO Department of Statistics' online database ILOSTAT is continuously updated to reflect statistics compiled and processed every week. In general, statistics for EUROSTAT and OECD countries are available around the 2nd or 3rd

quarter of the year following the year of reference, whereas they are usually available around the 3rd or 4th quarter of the year following the year of reference for the other countries.

Data providers

Mainly National Statistical Offices, and in some cases Labour Ministries or other related agencies, at the country-level. In some cases, regional or international statistical offices can also act as data providers.

References

- ILO Guidebook - Decent Work and the Sustainable Development Goals: A Guidebook on SDG Labour Market Indicators (https://www.ilo.org/stat/Publications/WCMS_647109/lang--en/index.htm)
- Decent Work Indicators Manual: http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_223121.pdf
- Resolution concerning statistics of work, employment and labour underutilization, adopted by the 19th ICLS in 2013: http://www.ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adoptedby-international-conferences-of-labour-statisticians/WCMS_230304/lang--en/index.htm
- International Standard Classification of Education (ISCED) developed by UNESCO: http://www.uis.unesco.org/Education/Pages/international-standard-classification-of-education.aspx
- What does NEETs mean and why is the concept so easily misinterpreted? (ILO, W4Y, Technical brief n°1): http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_343153.pdf
- ILOSTAT database: www.ilo.org/ilostat
- ILOSTAT Metadata – Indicator Descriptions (http://www.ilo.org/ilostat-files/Documents/description_NEET_EN.pdf)

12: Manufacturing employment as a proportion of total employment

Definition:

The indicator is represented by the share of manufacturing employment in total employment.

Rationale:

This indicator conveys the contribution of manufacturing in total employment. It measures the ability of the manufacturing sector to absorb surplus labour forces from agricultural and other traditional sectors towards production labour with higher wages, when monitored over time. However, in developed countries an opposite trend is expected where emphasis has shifted to reduction in labor in manufacturing as part of cost-cutting measures, to promote more capital-intensive industries.

Concepts:

Employment comprises all persons of working age who during a short reference period (one week), were engaged in any activity to produce goods or provide services for pay or profit. The working-age population is usually defined as all persons aged 15 and above. For further clarification, see: Resolution concerning statistics of work, employment and labour underutilization (2013), available from http://ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-by-international-conferences-of-labour-statisticians/WCMS_230304/lang--en/index.htm. No distinction is made between persons employed full time and those working less than full time.

Manufacturing sector is defined according to the International Standard Industrial Classification of all Economic Activities (ISIC) revision 4 (2008, the latest) or revision 3 (1990). It refers to industries belonging to sector C in revision 4 or sector D in revision 3.

Comments and limitations:

The characteristics of the data source impact the international comparability of the data, especially in cases where the coverage of the source is less than comprehensive (either in terms of country territory or economic activities). In the absence of a labour force survey (the preferred source of data for this indicator), some countries may use an establishment survey to derive this indicator, but these usually have a minimum establishement size cut-off point and small units which are not officially registered (whether in manufacturing or not) would thus not be included in the survey. Consequently, employment data may be underestimated. Discrepancies can also be caused by differences in the definition of employment or the working–age population.

Methodology

Computation Method:

$$\frac{\text{Total employment in manufacturing activities}}{\text{Total employment in all economic activities}} * 100$$

Disaggregation:

-Disaggregation by sex.
-Disaggregation by city/urban level.

Treatment of missing values:

- At country level

Multivariate regression and cross-validation techniques are used to impute missing values at the country level. The additional variables used for the imputation include a range of indicators, including labour market and economic data. However, the imputed missing country values are only used to calculate the global and regional estimates; they are not used for international reporting on the SDG indicators by the ILO.
For a more detailed methodological description, please refer to Trends Econometric Models: A Review of Methodology (ILO, Geneva, 2010), available at http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_elm/---trends/documents/publication/wcms_120382.pdf .

- At regional and global levels

The aggregates are derived from the Trends Econometric Models (TEM) that are used to produce global and regional estimates of, amongst others, employment by economic activity. These models use multivariate regression and cross-validation techniques to impute missing values at the country level, which are then aggregated to produce regional and global estimates. The regional and global shares of employment in manufacturing are obtained by first adding up, across countries, the numerator and denominator of the formula that defines the manufacturing employment as a proportion of total employment - outlined above. Once both magnitudes are produced at the desired level of aggregation, the ratio between the two is used to compute the share for each regional grouping and the global level. Notice that this direct aggregation method can be used due to the imputation of missing observations. For further information on the TEM, please refer to the technical background papers available at: http://www.ilo.org/empelm/projects/WCMS_114246/lang--en/index.htm.

Regional aggregates:

The ratio for global and regional aggregates is calculated after direct summation of country values within country groups.

Sources of discrepancies:

The difference may arise due to: a) discrepancies in data sources; b) ISIC Revision used by a country; c) informal employment; d) coverage of data source (geographical coverage, economic activities covered, types of establishments covered, etc.); e) working-age population definition..

Data Sources

Description:
The preferred official national data source for this indicator is a household-based labour force survey.

In the absence of a labour force survey, a population census and/or other type of household survey with an appropriate employment module may also be used to obtain the required data.
Where no household survey exists, establishment surveys or some types of administrative records may be used to derive the required data, keeping into account the limitations of these sources in their coverage. Specifically, these sources may exclude some types of establishments, establishments of certain sizes, some economic activities or some geographical areas.

Collection process:

The ILO Department of Statistics sends out its annual questionnaire on labour statistics to all relevant agencies within each country (national statistical office, labour ministry, etc.) requesting the latest annual data and any revisions on numerous labour market topics and indicators, including many SDG indicators. Indicator 9.2.2 is calculated from statistics submitted to the ILO Department of
Statistics via this questionnaire as well as through special agreements with regional and national statistical offices or through ILO processing of microdatasets of national labour force surveys.

UNIDO employment data are collected using General Industrial Statistics Questionnaire which is filled by NSOs and submitted to UNIDO annually.

Data Availability

Description:

Data is available in ILOSTAT for around 170 countries and territories.

Time series:

Data for this indicator is available as of 2000 in the UN Global SDG Database, but longer time series are available in ILOSTAT.

Calendar

Data collection:
The ILO Department of Statistics sends out its annual questionnaire on labour statistics, usually in the 2nd quarter, with a view to receiving the requested statistics by the 3rd quarter or the end of the year at the latest. Data received in batch from regional and national statistical offices and data obtained through the processing of microdata sets of national household surveys by the ILO Department of Statistics are continuously updated in ILOSTAT (as they become available to the ILO Department of Statistics).

Data release:
The ILO Department of Statistics' online database ILOSTAT is continuously updated to reflect statistics compiled and processed every week. In general, statistics for EUROSTAT and OECD countries are available around the 2nd or 3rd quarter of the year following the year of reference, whereas they are usually available around the 3rd or 4th quarter of the year following the year of reference for the other countries.

Data providers

Mainly national statistical offices, and in some cases labour ministries or other related agencies, at the country-level. In some cases, regional or international statistical offices can also act as data providers.

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URL:

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2. Decent Work Indicators Manual: http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_223121.pdf
3. Resolution concerning statistics of work, employment and labour underutilization, adopted by the 19th ICLS in 2013: http://www.ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adoptedby-international-conferences-of-labour-statisticians/WCMS_230304/lang--en/index.htm
4. ILOSTAT database: www.ilo.org/ilostat
5. ILOSTAT Metadata – Indicator Descriptions (http://www.ilo.org/ilostat-files/Documents/description_ECO_EN.pdf)
6. International Standard Industrial Classification of All Economic Activities 2008 (https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf)

13: Proportion of urban population living in slums, informal settlements or inadequate housing

Definition:

One of the commitments of member states in the New Urban Agenda was to support the progressive realization of the right to adequate housing for all. One way to measure progress towards achieving this commitment is by monitoring the percentage of the population that live in slums or informal settlements or in inadequate housing[27].

This indicator will have four components:

a. Percentage of people in slum and informal settlements households;
b. Percentage of people in slum households;
c. Percentage change in the number of households living in slum conditions;
d. Percentage of people in inadequate housing;

Rationale:

Article 25 of the Human Rights Declaration gives everyone the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services[28]. With the adoption of the New Urban Agenda in October 2016 in Quito, Member States committed themselves to promoting national, subnational and local housing policies that achieve adequate housing for all as a component of the right to an adequate standard of living, one of the rights in the Human Rights Declaration. This indicator measures the percentage of population that has inadequate housing, including those that live in slums or informal settlements. It is a measure of how far a country is from achieving adequate housing for all, one of the key commitments in the New Urban Agenda (NUA §31).

The rationale for this indicator is that when people have adequate housing, they are more likely to be healthy, and they are in a better position to have more education and skills training and hence improve their skills.[29] Housing expenditures, in the form of new buildings or renovations, has a multiplier effect throughout the economy. Stimulating industries that supply housing construction supplies, leading to more employment and output.

A key aspect of adequate housing is that it should be affordable, because if housing is unaffordable for the household, then it does not have enough money for other needs including food, clothing, medical care and cost of commuting. Hence, the household does not have an adequate standard of living.

Slum:

The international definition for a slum household is one which has one or more of the following household deprivations:

1. Lack of access to improved water source,

[27] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened and adapted to NUA monitoring.
[28] United Nations, The Universal Declaration of Human Rights, Article 25, https://www.ohchr.org/EN/UDHR/Documents/UDHR_Translations/eng.pdf
[29] UN-HABITAT, 2017, "Measuring the SDG Target 11.1's Indicator – Background concept note", page 8

2. Lack of access to improved sanitation facilities,
3. Lack of sufficient living area,
4. Lack of housing durability, and
5. Lack of security of tenure.

Improved water sources include: piped water into dwelling, yard or plot; public tap/standpipe serving no more than 5 households; protected spring; rainwater collection; bottled water (if secondary source is also improved); bore hole/tube well; and protected dug well. A household has enough water for every member, if it has access to at least 20 liters per day per person.

The Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water is the percentage of the population using a basic sanitation facility which is not shared with other households and where excreta is safely disposed in the original place or treated off-site. 'Improved' sanitation facilities include: flush or pour flush toilets to sewer systems, septic tanks or pit latrines, ventilated improved pit latrines, pit latrines with a slab, and composting toilets.

A household has sufficient living area if no more than 3 people share a habitable room that is at least four square meters[30].

Durable housing must meet the following criteria, built on a location where there is no risk of flooding or other hazards, its walls, roof and floor must made from permanent building material, and comply with building codes and be in good state of repair.

A household has secure tenure when it has evidence of documentation proving that it has secure tenure status or perceived protection from forced evictions.

Informal Settlements:

In the context of indicator 11.1.1, Informal settlements can be defined as lack of basic services (improved water and improved sanitation) or lack a durable housing or lack of security of tenure. Both rich and poor urban residents live in informal settlements. It is important to monitor the number of households living in informal settlements, this facilitates computation of percentage change in the number of households living in informal settlements, an indicator that can be used to monitor the impact of programmes.

Inadequate Housing:

A household has inadequate housing if it does not meet one of the following criteria: legal security of tenure; availability of basic services and infrastructure; affordability (if its cost is too high for the household); habitability; accessibility; location; and cultural adequacy. Habitability refers to whether housing lets in dampness, cold, rain or is structurally unsound. Accessibility refers to whether it is accessible to vulnerable groups such as those with disabilities. Location refers to whether the housing is within easy commuting distance to places of work, healthcare facilities and schools or is near dangerous sites.

[30] Same definition/criterion as under MDGs http://mdgs.un.org/unsd/mdg/Metadata.aspx

Affordability:

Households that spend 30 percent or more of their income on housing costs are considered to live in unaffordable housing, which is one of the criteria for determining "Percentage of people in inadequate housing households (IHH)".

Summary:

The criteria for classifying slums or informal settlements or in inadequate housing can be summarized as[31]:

Table 2. Criteria defining slums, informal settlements and inadequate housing

	Slums	Informal Settlements	Inadequate Housing
Access to water	X	X	X
Access to sanitation	X	X	X
Sufficient living area, overcrowding	X		X
Structural quality, durability and location	X	X	X
Security of tenure	X	X	X
Affordability			X
Accessibility			X
Cultural adequacy			X

Data sources and computation method:

The national focal point for this indicator can obtain this data from the national statistical office. A national statistical office can compute percentages of population living in slums, informal settlements, inadequate housing and unaffordable housing utilizing household surveys such as Demographic Health Surveys (DHS), MICS and population and housing census data as well as household income and expenditure survey. The five components of this indicator are computed as follows:

(a) Percentage of people in slum and informal settlements households (SISH) =

$$100\ [\frac{\text{Number of of people living in SISH households}}{\text{City population}}]$$

(b) Percentage of people in slum households = $100\ [\frac{\text{Number of of people living in slum households}}{\text{City population}}]$

(c) Percentage change in the number of households living in slum conditions=

$$100\ [\frac{(\text{Number of households living in slum conditions year t}) - (\text{number of households living in slum conditions year t} - 1)}{(\text{number of households living in slum conditions year t} - 1)}]$$

(d) Percentage of people in inadequate housing = $100[\frac{\text{Number of of people living in IHH}}{\text{City population}}]$

[31] https://unstats.un.org/sdgs/metadata/

Disaggregation:

Data to be provided at national urban and city level, and when possible disaggregated by income group, age of household members, disability of household members, as well as sex, race, ethnicity, religion and migration status of the head of the household.

Monitoring Frequency:

This indicator will be monitored at 3 – 5 year intervals until the year 2036.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Data providers

The main data source is the national statistical office

Data compilers

UNHABITAT

References

1. New Urban Agenda, page 12, http://habitat3.org/wp-content/uploads/NUA-English.pdf
2. The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened and adapted to NUA monitoring.
3. United Nations, The Universal Declaration of Human Rights, Article 25, https://www.ohchr.org/EN/UDHR/Documents/UDHR_Translations/eng.pdf
4. UN-HABITAT, 2017, "Measuring the SDG Target 11.1's Indicator – Background concept note", page 8
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14: Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities

Definition:

This indicator will be monitored by the proportion of the population that has convenient access to public transport. The access to public transport is considered convenient when an officially recognized stop is accessible within a distance of 0.5 km from a reference point such as a home, school, workplace, market, etc. Additional criteria for defining public transport that is convenient include[32]:
a. Public transport accessible to all special-needs customers, including those who are physically, visually, and/or hearing-impaired, as well as those with temporary disabilities, the elderly, children and other people in vulnerable situations.
b. Public transport with frequent service during peak travel times
c. Stops present a safe and comfortable station environment

In the context of monitoring of the implementation of NUA, the target is by 2036, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of in vulnerable situations, women, children, persons with disabilities and older persons.

Rationale:

This indicator is for monitoring the use of and access to the public transportation system and less use of the private transportation, better access to public transport in areas with a high percentage of elderly citizens, physically challenged individuals, and low income earners or high density residential areas, public housing and reducing the distances public transport stops. The accessibility requires high-capacity public transport systems that are well integrated in a multimodal arrangement and within comfortable walking or cycling distances from homes and jobs for all.

The ability of residents including persons with disabilities to access markets, employment opportunities, and service centres such as schools and hospitals is crucial for efficient economic activity. The transport system facilitates access to resources and employment opportunities. The aim of this indicator is to measure progress in terms of a higher percentage of the population having access to public transportation, hence contributing to reduction in pollution. The transportation system is a key facilitates of economic activities and social inclusion. Emissions from transport are now responsible for 23% of global Green House Gas Emissions and are increasing faster than any other source; outdoor air pollution alone, a major source of which is transport, is responsible for 3.7 million deaths annually, road traffic accidents kill more than 1.2 million people every year while traffic reduce GDPs. Progress on access to public transportation is key to achieving Sustainable Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable. Accessibility to services, goods and opportunities for all is facilitated by making cities more compact and walkable by the integration of land-use planning with transport planning.

Improving the access to low-income and high-density residential areas with a high proportion of elderly citizens and physically challenged individuals improves the efficiency and the sustainability of the public transport system. Better access to employment opportunities reduces income, consumption and spatial inequalities, thus making cities more inclusive, safe and sustainable. Effective and low-cost transportation is key to reducing urban poverty and inequalities and enhancing economic development. Clean public transport is a very efficient way to lowering levels of energy consumption, the reducing of CO2 emissions and slowing climate change.

Concepts:

[32] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened.

This indicator is monitored by the proportion of the population that has convenient access to public transport, since most public transport users walk from their trip origins to public transport stops and from public transport stops to their destinations, as opposed to driving and parking and ride or transfers. That is why the access to public transport is considered convenient when an officially recognized stop is accessible within a distance of 0.5 km from a home, school, workplace, market, etc. Additional criteria for defining public transport that is convenient include:
a. Public transport accessible to all special-needs customers, including those who are physically, visually, and/or hearing-impaired, as well as those with temporary disabilities, the elderly, children and other people in vulnerable situations.
b. Public transport with frequent service during peak travel times.
c. Stops that are safe and comfortable.

Public transport is defined as a shared passenger transport service that is available to the general public. It includes cars, buses, trolleys, trams, trains, subways, and ferries that are shared by strangers without prior arrangement. It excludes taxis, carpools, and hired buses, which are not shared by strangers without prior arrangement. It also excludes informal, unregulated modes of transport (para-transit), motorcycle taxis, three-wheelers, etc.

Public transport has to fulfil the following conditions: well designed 'stops' for passengers to embark and 'routes' that are both officially or formally recognized.

Additional methodological comments:

The method to estimate the proportion of the population that has convenient access to public transport has four steps:
a) Spatial analysis to measure the built-up area of the urban agglomeration and calculate the total area (square kilometres). Boundaries should be aligned with census enumeration areas so that to have matching demographic data.

b) Recording of the public transport stops in the urban agglomeration: information can be obtained from city administration or service providers, open sources and community-based maps alternative. Where possible assign characteristics of the quality, universal accessibility for people with disabilities, safety, and frequency of the service to the public transport stops' inventory for detailed analysis and further disaggregation.

c) Estimation of urban area with access to public transport:

Use a map with the inventory of officially-recognized public transport stops and create a buffer area of 500m radius for each stop. Merge and clip with boundary of the boundary built-up area of the urban agglomeration.

d) Estimation of the proportion of the population with convenient access out of the total population of the city:

Overlay GIS demographic data on the number of dwellings within the area with access to public transport stop. Calculate the population within those dwellings. Estimate the proportion of population out of the total population of the city.

In addition to the above, other considerations of tracking the transport target include the following:

a) Accessibility related to urban planning: this parameter can be measured using density (people/sq.km) from census surveys, Percentage of street space in cities and Number of Intersections / Sq. Km from analysis of earth observations and/or city maps. Density is an important determinant for the efficiency of public transport systems. The adequacy of streets and crossings determine urban accessibility to a great extent.

b) Accessibility related to transport planning: this parameter can be measured using Percentage of population within 500m of mass transit stop from City maps and sample survey data or census.

c) Affordability: this can be obtained from percentage of household income of lowest quintile of population spent on transport from Sample surveys and Willingness to Pay surveys. Poorest quintile should not spend more than 5% of their household income on transport.

d) Quality: this parameter can be measured using travel time, universal access, safety, security, comfort and user information from sample surveys.

e) Modal shift to sustainable transport: this is also expressed in Modal share (cars, non-motorized transport, pedestrian traffic), Passenger KM travelled on electric vehicles as percentage of total passenger KM travelled in urban areas from City mobility surveys. This parameter is also important due to transport's contribution to carbon emissions and air quality issues in cities.

Comments and limitations:

Currently, there is no internationally agreed methodology for measuring convenience and service quality of public transport. Consequently, comparable harmonized global/local data on urban transport systems do not exist.

It is recognized that convenience measured as distance does not reflect the quality of the public transport which will vary from country to country.

It is recognized that in addition to proximity to the transport stop: affordability, safety, and universal accessibility may influence the usage of public transport. Yet, existence of widely accessible public transport is a precondition for its usage.

High capacity public transport, such as trains allows for a larger capture area, beyond the 0.5km of the proposed indicator.

It is also recognized that there are various forms of public transport in the member countries that are not fully defined or captured in this methodology. In particular, many developing countries have access to public transport that is available anywhere on the streets and not necessarily at designated public transport stops. The creation of designated stops is a precondition of measurement of this indicator in these countries.

Methodology

Computation Method:

This indicator is computed based on the following criteria:

Service areas are identified by a buffering operation (using GIS) by constructing lines of equal proximity around each public transport stop or each public transport route. The key decision is whether routes or stops should be used as the reference of measurement. The two approaches may lead to very different values of spatial availability. But generally, public transport stops offer a more appropriate basis than routes for estimating service area coverage because stops are the actual locations where public transport users access the system. A common practice is to assume that individuals that will utilize the public transport are within 0.5km (or 500m) of either a public transport route or stop. Some studies measure the distance based on air or Euclidean distance, while others use network distance (that is, the walk distance computed using the street network to reach a public transport feature. Since the network distance between two locations in space is greater than, or equal to, the corresponding air distance, the size of a coverage area defined by the network distance will be smaller than, or equal

to, that defined by air distance. However, because of the additional data requirements and the amount of processing effort involved, travel time (network distance) measures are rarely used in practice. For this indicator the public transport stop will be used as the point of service.

The identification of the population served

Once a service buffer is constructed, overlay the buffer onto census tracts or other polygons for which socio-demographic data (such as population figures, disabled persons) is available. These polygons are referred to as the analysis zones.

Integrating local temporal availability.

The methodology does not take into account the frequency of public transport service, it is based solely on spatial access to stops or routes. This wait time for public transport is related to the frequency of the service, and is completely left out when conducting global comparison, but countries that can capture this additional component are encouraged to collect and report this information as part of the disaggregation.

Finally, the population with access to public transport out of the entire city population will be computed as;

Percentage with access to Public transport =100x[(population with convenient access to Public transport)/(City Population)]

Disaggregation:

Information can be disaggregated as shown below, including potential disadvantages such as disability, but it requires strong efforts and changes in mainstream mechanisms of data collection:
Disaggregation by location (intra-urban).
Disaggregation by income group.
Disaggregation by sex (female-headed household).
Disaggregation by race (head of household).
Disaggregation by ethnicity (head of household).
Disaggregation by migratory status (head of household).
Disaggregation by age.
Disaggregation by mode of public transport.

Quantifiable Derivatives:
- Proportion of urban area that has convenient access to public transport.
- Proportion of population/urban area that has convenient access to public transport stop with universal accessibility for people with disabilities.

Data Sources

Description:

The actual and recommended data sources for this indicator are the following:
- Data on location of public transport stops in city: city administration or service providers, GIS data
- Dwelling units within 500m of public transport stops: Census, GIS data
- Number of residents per dwellings unit: Census/household survey

- Household surveys that collect information on the proportion of households that declare they have access to public means of transport within 0.5 km. These surveys can also collect information about the quality of the service.

Due to its spatial nature, the use of the urban agglomeration is a precondition for the measurement and comparability of this indicator.

Collection process:

At the Global level, all this data will be assembled and compiled by the UN-Habitat and other partners.

Data Availability

This indicator has an established methodology but data is not readily available.

Another limitation is that no internationally agreed methodology exists for measuring convenience and service quality of public transport.

Calendar

Data collection:

The monitoring of the indicator can be collected annually until the year 2036.

Data providers

National Focal points will nominated by respective Governments. Such focal points could be the ministries themselves, NSOs, academic or research institutions, Civil Society Organisations, operators or a combination of.

Data compilers

UN-Habitat

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15: Ratio of land consumption rate to population growth rate

Definition:

The indicator is defined as the ratio of land consumption rate to population growth rate[33].

This indicator requires two definitions: (a) land consumption rate and (b) population growth rate.

Population growth rate = $[(P_{t+1}-P_t)/P_t]*100$ where P_t and P_{t+1} is the population at beginning and end of the reference year, respectively, this is a percentage.
The percentage of current total urban land that was newly developed (consumed) is the measure of the land consumption rate. The fully developed area is also sometimes referred to as built up area.

Rationale:

In the New Urban Agenda, Member States committed themselves to encouraging spatial development strategies guide urban extension, prioritizing urban renewal by planning for well-connected infrastructure and services, sustainable population densities and compact design and integration of new neighbourhoods and preventing urban sprawl. They also committed themselves to promoting planned urban extensions and infill, prioritizing renewal, regeneration and retrofitting of urban areas as well as preserving and promoting the ecological and social function of land, including coastal areas that support cities and human settlements, and to fostering ecosystem-based solutions to ensure sustainable consumption and production patterns, so that the ecosystem's regenerative capacity is not exceeded In this connection, they committed to promoting integrated urban and territorial planning, including planned urban extensions based on the principles of equitable, efficient and sustainable use of land and natural resources and multiple use of space, as well as mixed social and economic uses in built-up areas (NUA §52, 69, 97, 98).

Globally, land cover today is altered principally by direct human use. A large proportion of cities both from developed and developing countries have high consuming suburban expansion patterns. A global study on 120 cities shows that urban land cover has, on average, grown more than three times as much as the urban population [1].

Comments and limitations:

In some cases, it is difficult to measure the urban expansion by conurbations of two or more urban areas that are in close proximity; to whom to attribute the urban growth and how to include it as one metric usually becomes a challenge. At the same time, data would not always coincide to administrative levels, boundaries and built-up areas. However, the European Commission highlights some possible drawbacks of this indicator that can be technically addressed. Efforts to use the area of reference at the level of the built-up area of the urban agglomeration should be taken into consideration. The delimitation of city boundaries may be another methodological problem that a clear agreed definition can solve.

The indicator may experience difficulties in capturing cities with negative or zero population growth; or cities that due to severe disaster have lost part of their territories. To face this challenge, the baseline/benchmark of population

[33] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened.

density and its change over time must be taken into consideration. Reducing densities below sustainable levels have impacts on the cities' sustainability.

In the absence of the GIS layers, this indicator may not be computed as defined. As a result, more alternative measures for land that is developed or consumed per year can be adequately used. Alternatively, one can monitor the efficient use of urban land by measuring how well we are achieving the densities in residential zones that any city plans or international guidance call for. Comparing achieved to planned densities is very useful at the city level. However, planned densities vary greatly from country to country, and at times from city to city. At the sub-regional or city levels, it is more appropriate to compare average densities achieved currently to those achieved in the recent past. While building more densely does use land more efficiently, high density neighbourhoods, especially in and around urban centres, have a number of other advantages. They support more frequent public transportation, and more local stores and shops; they encourage pedestrian activity to and from local establishments; and they create lively (and sometimes safer) street life.

Methodology

Computation Method:

A more elaborate formula to estimate the land use efficiency will be provided with two stages.

Stage 1: Estimate the population growth rate.

Population Growth rate i.e. PGR = $\ln(P_{t+n}/P_t)/(y)$

Where
P_t is total population within the city in the past/initial year
P_{t+n} is total population within the city in the current/final year
y is the number of years between the two measurement periods

Stage 2: Estimating the land consumption rate

This rate gives us a measure of compactness which indicates a progressive spatial expansion of a city.

Land consumption rate i.e. LCR = $\ln(Urb_{t+n}/Urb_t)/(y)$

Where
Urb_t is total areal extent of the urban agglomeration in km^2 for past/initial year
Urb_{t+n} is total areal extent of the urban agglomeration in km^2 for current year
y is the number of years between the two measurement periods

The formula to estimate the ratio of land consumption rate to population growth rate (LCRPGR) is provided as follows:

LCRPGR= (+ (Land Consumption rate)/(Annual Population growth rate))

And the overall formula can be summarized as:
LCRPGR = $(((\ln(Urb_{t+n} / Urb_t))/y))/((\ln(P_{t+n}/P_t)/y))$

The periods for both urban expansion and population growth rates should be at comparable scale.

Disaggregation:

Potential Disaggregation:
- Disaggregation by location (intra-urban)
- Disaggregation by income level
- Disaggregation by urban typology

Quantifiable Derivatives
- Population density
- Population density growth/reduction rate
- Annual amount of urban expansion (km^2)

Percentage of urban expansion in relation to the urban footprint area

Treatment of missing values:

- At country level

  All countries are expected to fully report on this indicator more consistently after 2-3 years with few challenges where missing values will be reported due to missing base map files. Therefore, any missing values will be representative of populations where either population growth figures are unavailable or land consumption rates are inestimable. Because the values will be aggregated at the national levels from a national sample of cities, missing values will be less observed at national and global levels

- At regional and global levels

  See section above.

Regional aggregates:

Data at the global/regional levels will be estimated from national figures derived from national sample of cities. Regional estimates will incorporate national representations using a weighting by population sizes. Global monitoring will be led by UN-Habitat with the support of other partners and regional commissions.

Sources of discrepancies:

Based on several consultations, we note that in order to calculate the land use efficiency ratio we must stabilize the definition of population and spatial footprint of the city which is literally defined as “urban extension”. Unclear spatial definitions and an occasional use of admin boundaries arbitrarily set for population and surface accounting creates more spatially-generated noise than signal in the final accounting of the indicators. Already some spatial noise is particularly created by the use of ratios. The following data sources will be harmonized to ensure more consistent reporting on this indicator--Satellite data, built-up areas grids, time-standardized census population grids; globally complete classification grids can be aggregated to admin units but may create inconsistencies if they are not available for all cities, allowing to classify them by dominance of the urban/rural surfaces or similar approaches.

Data Sources

Description:

Data for this indicator is available for all cities and countries (UN DESA population data) and satellite images from open sources. Several sources of information are required for this computation: Satellite imagery from open sources or the exact measurements in km squared of the built-up areas or the land that is fully developed in Km squared, annual urban population data for the reference years of analysis.

Data for the size of the city land that is currently considered as developed is usually available from the urban planning units of the cities. New options using remote sensing techniques have also been developed to estimate the land that is currently developed or considered as built up areas out of the total city land. This option also accurately extracts land that is considered as wetlands and hence unlikely to be occupied now or in the future.

When the spatial measurement option is used, the use of the urban agglomeration (built-up area) is a precondition for the measurement and comparability of this indicator. Data for this indicator can be easily availed using global and local sources. The indicator has been collected and analyzed since 2000 by several municipalities and countries. Various governments (Mexico, Colombia Brazil, India, Ethiopia, etc., and most European countries) have collected data on this indicator recently.

Eurostat collects data on this indicator using other comparable techniques. World Bank and Lincoln Institute collected data for 120 cities and published it in the Atlas of Urban Expansion. [02]. Currently UN-Habitat, Lincoln Institute and New York University prepared a similar study for another 200 cities.
UN-Habitat City Prosperity Initiative is collecting data on this indicator for nearly 300 cities as part of the Agency’s efforts to integrate spatial analysis in the SDGs.

Collection process:

National level capacity building initiatives will aim to balance the knowledge and understanding of the analysis, compilation and reporting of this indicator. Global reporting will rely on the estimates that come from the national statistical agencies. With uniform standards in computation at the national level, few errors of omission or bias will be observed at the global/regional level. A rigorous analysis routine will be used to re-assess the quality and accuracy of the data at the regional and global levels. This will involve cross-comparisons with expected ranges of the values reported for cities.

Data Availability

Description:

This indicator is categorized under Tier II, meaning the indicator is conceptually clear and an established methodology exists but data on many countries is not yet available. The Global Human Settlement Layer (GHSL) technology open framework is proposed for global open spatial baseline data production (built-up and population grids) – global open data is available and will be updated by EU support plus international partnership, the tools will be opened to national Authorities by a new platform and capacity building program that will be soon made available with the support of the EU and Habitat. Every country will soon be able to build their own set of built-up and population grids, or to use the globally available ones.

Time series:

Available time series runs at the city and national level for selected countries

Calendar

Data collection:

The monitoring of the indicator can be repeated at regular intervals of 5 years, allowing for three reporting points until the year 2030. Initial reporting is targeted for 2017 for all cities in the global sample of cities.

Data release:

Updates will be undertaken every year, which would allow for annual updates in reporting at the global level post 2017.

Data providers

UN-Habitat and other partners such as the Global Human Settlement Layer (GHSL) team and ESRI will support various components for reporting on this indicator. The global responsibility of building the capacity of national governments and statistical agencies to report on this indicator will be led by UN-Habitat. National governments/national statistical agencies will have the primary responsibility of reporting on this indicator at national level with the support of UN-Habitat to ensure uniform standards in analysis and reporting.

Data compilers

UN-Habitat
UN-Habitat with the support of other selected partners will lead the compilation of data for this indicator.

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16: Percentage of countries with a direct participation structure for civil society engagement in urban planning and management, which are regular and democratic

Definition:

This indicator measures the availability of structures for participation and civic engagement of National Urban programmes with particular attention to project/programme beneficiaries and vulnerable children, adolescent girls and boys. Therefore local and national governments should strive to: a) facilitate and protect people's participation and civic engagement through independent civil society organizations that can be from diverse backgrounds - local, national, and international; b) promote civic and human rights education and training programmes to make urban residents aware of their rights and the changing roles of diverse children, adolescent girls and boys, women, men, and young women and men in urban settings; c) remove the barriers that block participation of socially marginalized groups and promote non-discrimination and the full and equal participation of children, adolescent girls and boys, women, young men and women and marginalized groups.

Rationale:

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Concepts:

Democratic participation: Structures allow and encourage participation of civil society representing a cross-section of society that allows for equal representation of all members of the community.

Direct participation: Structures allow and encourage civil society accessing and actively engaging in decision-making, without intermediaries, at every stage of the urban planning and management process.

Regular participation: Structures allow and encourage civil society participation at every stage of the urban planning and management process, and at least every six months.

Marginalized groups: Groups of people that are not traditionally given equal voice in governance processes. These include, but are not limited to, children, adolescent girls and boys, women, young men and women, low-income communities, ethnic minorities, religious minorities, people with disabilities, the elderly, sexual and gender identity minorities and migrants.

Structures: Any formal platform that allows for participation of civil society. This can include, but is not limited to: national or local legislation, policy, town council meetings, websites, elections, suggestion boxes, appeals processes, notice period for planning proposals etc.

Civil Society: These are any combination of private organizations that are not conventionally for profit operating independently of the government and not part of any government, including but not limited to non-governmental organizations, community groups, religious-based organizations, community-based organizations, regional representative groups, unions, research institutes, think tanks, professional bodies, non-profit sports and cultural groups, and any other groups that conduct its activities to advocate and champion for promotion of the interests and

wills of the members and wider community in the pursuit of relief of suffering, interests of the poor and vulnerable groups, and promotion of community development.

Urban Management: The officials, including elected officials and public servants, that are responsible for city-management, across all sectors, such as roads, water, sanitation, energy, public space, land title etc.

Urban Budget decision making: The process by which money is allocated to various sectors of urban management, including roads, roads, water, sanitation, energy, public space, land title etc.

Urban Planning, including Design and Agreements: The technical and political process that concerns the development and use of land, how the natural environment is used etc. Design includes over-arching and specific design of public space, as well as zoning and land use definitions. Agreements refer to specific contract/arrangements made with various groups in regard to their land, e.g. Indigenous groups, protected natural environments etc.

Outstanding / anticipated issues for this indicator:

The indicator measures the availability of structures for civil society participation in urban planning and management, which is a reflection of structures for citizen voices/participation. The fact that informed evaluators conduct the evaluation can introduce biases. These biases and discrepancies have been examined in the pilot phases and so far, the experiences are that the marginal differences are not as large as was expected.

Overall, the evaluator's assessments sometimes do not reflect a full analysis of the effectiveness or accessibility of these structures in its totality but gives a local idea of how these evaluators view the inclusiveness and openness on these structures to accommodate the participation of citizens and civil society. Changes in data will be examined for intra-city differences and within country differences over time to understand more sources for variations and internal consistencies.

Within the civic society landscape, there are numerous players including civil societies led by individuals, community groups, advocates, corporations and foundations. Similarly, there are many different views about the relevance and importance of civil society participation particularly, perhaps, among groups listed above. These varying structures at the urban level may either be available for involvement.

Finally, civic society engagement in urban planning and management involves overlapping pathways, and goals, including a mix of planned and unpredicted elements. Advancing toward a measurement frame is intended to help sort out theories and pathways – not to set hard boundary lines, but rather to help both urban managers and communities better understand what they are trying to achieve, and how they are getting there.

Methodology

To measure existence of direct participation structures of civil society in urban planning and management at the country or city level, a scorecard approach will be used to evaluate the available structures for civil society participation in urban planning and management, as evaluated by five (5) local experts from government, academia, civil society and international organizations. The identifications and selection of these 5 local evaluators/experts will be guided by local urban observatories teams that are available in many cities. In the pilot exercises, these urban observatories as local custodians of urban data at the city level are able to coordinate the assessments and check for consistencies and relevant local references that guide the decisions and scores of the evaluators.

A questionnaire with a 4-point Likert scale (strongly disagree, disagree, agree, and strongly agree) will be used to measure and test the existence of structures for civil society participation in urban governance and management. These structures are examined through four core elements and should be assessed as follows:

1. Are there structures for civil society participation in urban planning, including design and agreements, that are direct, regular and democratic?

2. Are there structures for civil society participation in local urban budget decision-making, that are direct, regular and democratic?

3. Are there structures for civil society evaluation and feedback on the performance of urban management, that are direct, regular and democratic?

4. Do these structures promote the participation of children, women, young men and women, and/or other marginalized groups?

The evaluators will score each of the questions on the Likert Scale, as below.

1 - Strongly disagree, 2 - Disagree, 3 - Agree, 4 - Strongly agree

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
Are there structures for civil society participation in urban planning, including design and agreements, that are direct, regular and democratic?				
Are there structures for civil society participation in urban budget decision making, that are direct, regular and democratic?				
Are there structures for civil society evaluation and feedback on the performance of urban management, that are direct, regular and democratic?				
Do the structures promote the participation of children, adolescent girls and boys, women, young men and women, and/or other marginalized groups?				

Once each of the five (5) categories is evaluated as shown in the table above, the scored will be averaged to have a final score per evaluator. These will then be average to get a final score per city.

Computation Method:

The Likert Scale will use the following guidance:

Strongly Disagree: There are no structures in place *or* available structures do not allow civil society participation that is direct, regular or democratic.

Disagree: Structures exist that allow civil society participation, but they are only partially direct, regular and democratic; or they are only one of direct, regular or democratic.

Agree: Structures exist that allow and encourage civil society participation that is direct and/or regular and/or democratic, but not all three.

Strongly Agree: Structures exist that allow and encourage civil society participation that is fully direct, regular and democratic.

To determine the proportion of cities with a direct participation structure of civil society in urban planning and management that operates regularly and democratically, a midpoint on the Likert scale of 2.5 will be used. The value of the indicator is the proportion of cities with overall score that is greater than the mid-point.

As a result, if we have N cities selected for the evaluation in a given country, and n is the number of cities with scores that are higher than the mid-point, the value of the indicator will be calculated as:

$$\text{Value of Indicator} = \frac{n}{N} \text{ (to be expressed as a percentage)}$$

Notably, the number of cities in which the evaluation will be conducted may be determined using the National Sample of Cities approach. The approach will help draw a sample of cities using sound statistical and scientific methodologies based on several relevant city-specific criteria/characteristics that capture the specific contexts of countries, ensuring that the sample is representative of a given country's territory, geography, size, history, etc.

The unit of measure is percentage.

Evaluators will be given further detailed guidance and criteria to follow.

Calculation of achievement rate:

Evaluators examine structures at the city and country level, including, for example, legislation, rules and regulations, policies and practice. Data is collected from Evaluators reports and scores who are attached to local urban observatories in various cities.

Disaggregation:

Required:

Male/Female, Disability, Urban/Rural, Geography, Wealth, Disability, Humanitarian/non-humanitarian situation, Age

Potential Disaggregation:

- Disaggregation by city characteristics
- By regularity of participation
- By nature, and typology of existing structures

Data Sources

The Ministry selected by the government as the focal point for this indicator. Some data can come from the cities directly.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

Bi-annual monitoring until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compiler

UNHABITAT

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17: Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)

Definition:

Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage, level of government, type of expenditure and type of private funding. In addition, for purposes of monitoring the New Urban Agenda "percent of city-level expenditure on urban heritage and culture" should be computed and presented too.

This is a Tier III SDG indicator, no data for this indicator is currently available and its methodology is still under development.

Rationale:

In the New Urban Agenda, Member States committed themselves to the sustainable leveraging of natural and cultural heritage in cities and human settlements through integrated urban and territorial policies and adequate investments at the national, subnational and local levels, to safeguard and promote cultural infrastructures and sites, museums, indigenous cultures and languages. This includes fostering an enabling environment for businesses and innovation and creation of decent and productive jobs through the promotion of cultural and creative industries, sustainable tourism, performing arts and heritage conservation activities (NUA §38, 45, 60 and 97).

Concepts:

Cultural heritage is the legacy of physical artefacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations[34]. Examples include: a) monuments: architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features which are of outstanding value from the point of view of history, art or science; b) groups of buildings: groups of separate or connected buildings, which because of their architecture, their homogeneity or their place in the landscape, are of outstanding value from the point of view of history, art or science; c) sites: works of man or the combined works of nature and man, and areas including archaeological sites, which are of outstanding value from the historical, aesthetic, ethnological or anthropological point of view[35].
Natural heritage: Natural features, geological and physiographical formations and delineated areas that constitute the habitat of threatened species of animals and plants and natural sites of value from the point of view of science, conservation or natural beauty. It includes nature parks and reserves, zoos, aquaria and botanical gardens[36]..

[34] http://www.unesco.org/new/en/cairo/culture/tangible-cultural-heritage/
[35] UNESCO CULTURE FOR DEVELOPMENT INDICATORS page 132, https://en.unesco.org/creativity/sites/creativity/files/digital-library/CDIS%20Methodology%20Manual_0.pdf
[36] http://uis.unesco.org/en/glossary-term/natural-heritage

Preservation: Aim of preservation is to obviate damage liable to be caused by environmental or accidental factors, which pose a threat in the immediate surroundings of the object to be conserved. Accordingly, preventive methods and measures are not usually applied directly but are designed to control the microclimatic conditions of the environment with the aim of eradicating harmful agents or elements, which may have a temporary or permanent influence on the deterioration of the object[37].

Methodology

Computation Method:

$B_{pi} = [b_i / B_i]*100$

B_{pi} = Percentage of annual budget provided for maintaining cultural and natural heritage in the year i
b_i = Total amount of annual budget provided for maintaining cultural and natural heritage in the year i
B_i = Total amount of annual public budget in the year i

The information that should be provided is B_{pi}, b_i and B_i. b_i and B_i can be supplied in both local currency and USD.

Disaggregation:

Data to be provided at national and city level.

Data Sources

The Ministry selected by the government as the focal point for this indicator. Some data can come from the cities, if they have expenditures on this indicator.

Collection process:

At the Global level, all this data will be assembled and compiled by the UNESCO. National focal points should send data to UNESCO with copy to UNHABITAT-GUO, unhabitat-guo@un.org.

Data Availability

Data of public expenditure and the percentage at different levels of government, can be obtained from the public authorities themselves.

Calendar

Data collection:

[37] UNESCO, Traditional Restoration Techniques: A RAMP Study, 1988.

The monitoring of the indicator can be annual until the year 2036.

Data providers

National Focal points will nominated by respective Governments.

Data compilers

UNESCO. In addition to what countries provide to UNESCO, UNHABITAT requires the data to be disaggregated by city-level and and computation of B_{pi} (Percentage of annual budget provided for maintaining cultural and natural heritage in the year i).

References

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http://uis.unesco.org/en/glossary-term/natural-heritage

18: Proportion of Municipal Solid Waste collected and managed in controlled facility out of total Municipal Solid Waste generated, by cities

Definition:

Proportion of solid waste generated by households and similar wasted generated by commercial and industrial establishments that is collected and disposed of in controlled facilities out of total municipal solid waste generated by cities.

Rationale:

In the New Urban Agenda, Member States committed themselves to strengthening the sustainable management of resources, including land, water (oceans, seas and freshwater), environmentally sound management and minimization of all waste. They committed to substantially reducing waste generation by reducing, reusing and recycling waste, minimizing landfills and converting waste to energy. In this context, they noted the need to promote adequate investments in protective, accessible and sustainable infrastructure and service provision systems for water, sanitation and hygiene, sewage, solid waste management, urban drainage, reduction of air pollution and storm water management. They also committed to ensure universal access to affordable, disposal of waste and sanitation, (NUA §71, 74, 119 and 121).

Concepts:

Municipal Solid Waste[38] (MSW) is solid waste generated by households, and solid waste of a similar nature generated by commercial and industrial premises, by institutions such as schools, hospitals, care homes and prisons, as well as solid waste from public spaces such as streets, markets, slaughter houses, public toilets, bus stops, parks, and gardens. The definition of MSW should follow the local definition, thus the local and national definition(s) of MSW should be incorporated. However, MSW should exclude mineral waste.

Total Municipal Solid Waste Generated by the City is the total municipal solid waste generated by the population in the defined boundary of the city[39].

Municipal Solid Waste Collected refers to municipal solid waste being moved from the point of generation, such as specific addresses or designated collection points, to the point of preparation for reuse, recycling, treatment or disposal, with proper regularity and frequency, in a way that does not adversely affect public health.

Municipal Solid Waste Managed in Controlled Facilities refers to municipal solid waste received by facilities with BASIC control level according to the ladder of control level, i.e. waste is treated or disposed of with engineering and/or management control in place to limit health and safety risks, as well as environmental impacts.

Comments and Limitations:

Collection of data for the indicator should be a routine function of a City waste department, however, in many cities it is not done and it will require training and capacity development for monitoring at both national and local level. The

[38] It can be noted that international data collections (e.g., UNSD/ United Nations Environment Programme Questionnaire on Environment Statistics-Waste Section) exclude waste from municipal sewage network and treatment, municipal construction and demolition waste from the definition of Municipal Solid Waste. Therefore, where possible data collected for this SDG indicator should allow for disaggregation by these categories which would allow for reporting for both the SDG and for other international reporting (e.g., UNSD/ United Nations Environment Programme Questionnaire).

[39] For this indicator monitoring, the boundary of municipality is recommended by experts as the municipality typically holds the responsibility of solid waste management for its area of jurisdiction, it is also the place where waste and other demographic data is most likely available. However, another definition of city is proposed to include all habituated areas (metropolitan areas) for the purpose of SDG reporting.

data collection will require a household survey on MSW generation and access to MSW collection services at least twice a year to take seasonal changes into account at municipality level. The survey can be expensive and labour intensive, which can make it unaffordable for cities in low-income countries. It also requires high technical skills and experience to judge the control level of the waste management facilities, hence a high technical capacity at local level for monitoring this indicator has to be developed. To aggregate the collected data on a national level, capacity development for the national government is also essential. Another key challenge for data precision in middle to low-income countries is the lack of accurate population data in their municipalities, particularly regarding informal settlements, where usually no waste collection service is taking place.

Method of Computation and Other Methodological Considerations

Computation Method:
SDG 11.6.1 comprises of two quantitative sub-indicators as follows:

Proportion of municipal solid waste collected

Equation 1

$$x = \frac{\text{Municipal solid waste collected}}{\text{Total municipal solid waste generated by the city}} \times 100\ (\%)$$

Proportion of MSW managed in controlled facilities

Equation 2

$$y = \frac{\text{Municipal solid waste managed in controlled facilities}}{\text{Total municipal solid waste generated by the city}} \times 100\ (\%)$$

Both indicators use the same denominator, i.e. 'total MSW generated by the city'.

Total municipal solid waste generated by the city can be estimated by multiplying the municipal solid waste generated per capita with the population of the city. When the MSW generation per capita is not available, a survey to determine the daily waste generation in households and other institutions (e.g. restaurants, hotels, hospitals, schools, etc.) should be conducted.

Data Sources and Collection Method

To calculate the indicator three data points are necessary, namely,

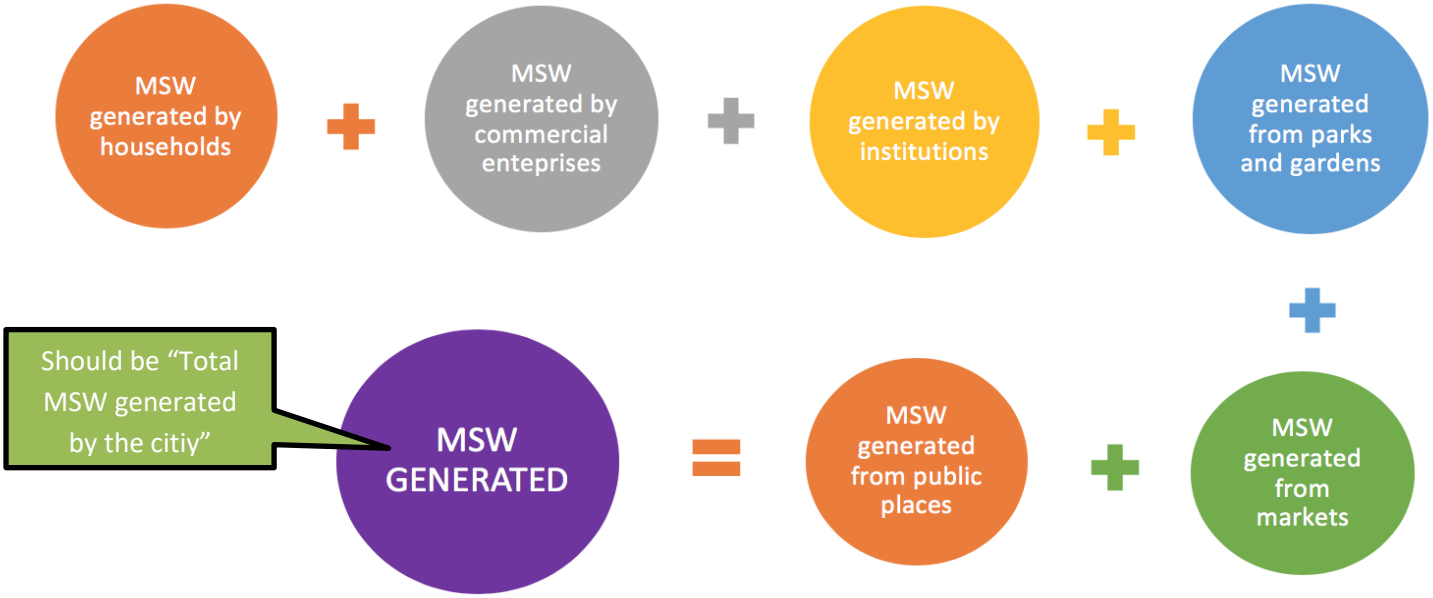
1) total MSW generated in the city;
2) total MSW collected in the city; and
3) total MSW managed in controlled facilities.

In general, municipal governments from high-income countries have detailed data on MSW generation and treatment, including how much MSW is treated in which treatment or facility type. They can therefore easily calculate the 11.6.1 indicator by using the existing data. However, in low- and middle-income countries it is not an unusual case that credible data regularly collected at local level and aggregated at national level is difficult to find. There is no globally standardized monitoring methodology on MSW data in line with the definition suggested under SDG 11.6.1, and collecting data is difficult, especially in circumstances where infrastructure or facilities to measure waste are absent. It should also be noted that in low- and middle-income countries the amount of illegal dumping of MSW and uncollected MSW is substantial, hence the sum of the recorded measurements of MSW received by landfill sites or

other facilities cannot represent the total MSW generation in the city. Therefore, we propose several data collecting methodologies for the three data points necessary for the calculation of 11.6.1, according to different situations concerning data and resources availability in different countries.

Total MSW Generation in the City:

MSW generated in the city is a sum of MSW generated by households, commercial enterprises, institutions, parks and gardens, markets and public spaces. In the following, methodologies for the estimation of the total MSW generation are described, ranking from 'light' to 'heavy' depending on the availability of resources different cities have described. These methodologies can be applied for cities without reliable MSW data.



1. **'Light' methodology**

   MSW generation increases when socio-economic factors of the society increase. Based on the socio-economic status of the city, per-capita MSW generation can be estimated based on globally available datasets including UNEP/UNSD Environmental Statistics, What a Waste 2.0 by World Bank (2018) and other data such as 'Wasteaware' ISWM Benchmark Indicators (WABI) database [40].

2. **'Medium' methodology**

   MSW generation can be estimated by collecting data from MSW collection companies, recycling companies and major junk shops, especially on how much waste is being received by them. This amount is divided by the population with access to waste collection services (not total population) to obtain per-capita MSW generation. This per-capita MSW generation is then multiplied with the total number of city inhabitants to receive total MSW generation in the city.

3. **'Heavy' methodology**

   This methodology measures the *average* ***household*** *solid waste generation per capita* of a random representative sample of residents and then multiplies it with the total number of city inhabitants. Furthermore, a random representative sampling of ***other*** waste generators, such as commerce, institutions and public spaces, is also conducted and the resulting amount for waste generated multiplied by the number

[40] http://benchmark.wasteaware.org/reports

of such generators in the municipality. As stated above, it should be noted that in low- and middle-income countries the amount of illegal dumping of MSW and uncollected MSW is not negligible, hence the sum of the recorded measurements of MSW received by landfill sites or other facilities cannot represent the total MSW generation in the city.

MSW generation from Household

The below listed steps are taken to estimate total MSW generation from households:

1) Identify 5 representative districts for large cities and 3 districts for small and medium cities from high, middle and low income areas in your city (5 or 3 districts x 3 different income groups, so 15 respectively 9 districts in total).
2) Distribute 8 liner bags to 10 households per district. Write dates, districts and a serial number on the liner bags to improve recording later. The necessary number of liner bags for the survey is 1,200 for large cities and 720 for small to medium cities.
   The minimum number of samples is 150 households for large cities and 90 households for small and medium cities. Although it depends on the number of households in the city, this generally represents a statistical confidence band of more than 85 %. Considering the practicality of conducting the survey regarding time and cost constrains, this is the recommended sample number. It is important to ask participating households to not sell or take out recyclables for rug pickers during the survey, so that the genuine waste generation in the household can be captured properly.
3) 2 days later go back to the households visited to pick up the first two days samples. Discard the first day's waste, as it is highly likely that it is not a representative sample. Some households put accumulated waste into the distributed liner bags, especially at the first day, making the sample not representative for the daily generation of waste. Measure the weight of every liner bag per household and average out the weight to obtain the daily waste generation. Repeat this until you get 7 liner bag samples per household.
4) Aggregate the data according to the different income groups from the 150 or 90 households using the below format.
5) Multiply average household MSW generation with the population of the city to obtain total household MSW generation in your city.

Household income level	**# of surveyed districts**	**# of househols per district**	**# of sample households**	**Average weight of daily MSW generation**	**Total population in the income group in the city**	**Average household MSW generation per capita**	**Total MSW generated**
High income	5 or 3	10	50 or 30	g/day		g/person/day	t/day
Middle income	5 or 3	10	50 or 30	g/day		g/person/day	t/day
Low income	5 or 3	10	50 or 30	g/day		g/person/day	t/day

MSW generation from Other Sources

The following steps are taken to estimate total MSW generation from other sources:

1) When distributing liner bags for households in selected districts, visit 2 hotels, 3 restaurants, 2 schools, 1 institution, 1 market and 1 hospital per district. If a city has large shopping malls, these should be visited separately too.
2) Interview, measure and record how much waste is generated per day and find out with which collection company they have a service contract.
3) Interview the collection companies about the amount of waste being generated from the interviewed premises, if necessary.

4) Survey what data is available for each premises for the purpose of aggregation, such as total sqm of hotels, restaurants, schools, institutions and markets. It might be that this data is not available, so confirm what data is available for the purpose of aggregation (total tourist number for hotels, total number of students for schools, total number of beds for hospitals, etc.). Any indication for the scale of the premises is good.
5) Aggregate data collected through the survey according to the different sources of MSW generation in the below format.

Generation source		**# of surveyed districts**	**# of premises visited per district**	**Total # of premises visited**	**Total # of sqm, population, students, etc.**	**Average MSW generation per day**	**Total MSW generated**
Commercial	Hotel	5 or 3	2	10 or 6	m^2	g/ m^2/day	t/day
	Restaurants	5 or 3	3	15 or 9	m^2	g/ m^2/day	t/day
	Shopping malls	5 or 3	1	5 or 3	m^2	g/ m^2/day	t/day
Hospitals		5 or 3	1	5 or 3	m^2	g/ m^2/day	t/day
Institutions		5 or 3	1	5 or 3	m^2	g/ m^2/day	t/day
Markets		5 or 3	1	5 or 3	m^2	g/ m^2/day	t/day
Street Sweeping		5 or 3	1	5 or 3	m	g/m/day	t/day

Total MSW generated by the city

The sum of the determined total MSW generated from households and other sources is the total MSW generated by the city.

Total MSW Collected:

The amount of waste collected will be estimated by two different approaches:

a) Consider the average amount of waste received by waste treatment, recycling and disposal facilities during the reporting year as MSW collected
b) Consider the proportion of the population with access to regular MSW collection services as a MSW collected

It is ideal to collect data for both a) and b). The data on a) can be obtained through records and interview of waste treatment, recycling and disposal facilities. The data on b) can be obtained through household surveys for total MSW generation per capita stated above. This household survey can be conducted when distributing the liner bags to the households for the total MSW generation survey. The proposed questions are:

1 How does your household usually dispose of garbage?	- Collected by service provider -> go to question 2 - 3 - Disposed of in designated waste container or collection point -> go to questions 2-4 - Disposed of within household plot - Buried or burnt - Disposed elsewhere - Don't know
2 Is your service provider formal or informal?	- Yes - No - Don't know
3 Do you receive waste collection services regularly?	- Yes - No

4 How far away is the designated waste container or collection point?	- ( ) number

In the methodology of b), if the waste is collected unregularly (anser No for question 3) or the distance is too far (more than 200 m is proposed, but this could be shorter/longer according to the local culture), it CANNOT be accounted as 'MSW collected'. Based on the results of the survey extrapolate to the entire city and specify proportion of population/commerce/institutions receiving at least basic collection services. Multiply those numbers by the average waste generation rates.

Estimation of MSW Managed in Controlled Facilities:

MSW managed in controlled facilities is the percentage of MSW processed, treated or safely disposed of in a facility that has reached at least an intermediate level of control, out of total municipal solid waste generated. The first stage in assessing the proportion of MSW managed in controlled facilities is to obtain a full list of the facilities where collected MSW is being managed. These facilities may include landfills and dumpsites, thermal treatment facilities such as incinerators, and biological and materials recovery/recycling facilities.

Data on the amounts of MSW being received at each facility needs to be collected. This can be derived from the City's waste management department records, from other published sources, or from site visits and surveys. Care needs to be taken to ensure that the following are discounted:

- MSW being received from other jurisdictions (e.g. other cities, satellite towns or rural areas not inside the City boundary); and
- MSW being rejected, by-produced or stored un-managed at the sites

The major facilities receiving MSW need to be visited. A facility operating outside of the formal waste management system may be recognised as an integral part of the waste management system, as long as there is a verifyable point of data collection. The level of control for a particular facility can be assessed using qualitative criteria focusing on the degree of control over waste treatment and disposal using the following evaluation and scoring matrix. MSW management facilities with 'Basic' or above level of control are considered as 'controlled facilities'.

	Level of Control	Land disposal	Thermal treatment	Biological and materials recovery/recycling
a.	Low (uncontrolled) facility	☐ No compaction ☐ No cover soil ☐ No fencing ☐ Fire/smoke existence ☐ No leachate control ☐ No equipment / limited equipment	☐ Uncontrolled burning ☐ No air / water pollution control	☐ Unregistered locations with no distinguishable boundaries ☐ No provisions made for workers ☐ No air / water pollution control
b.	Limited (semi-controlled) facility	☐ Some compaction ☐ No cover soil ☐ Some fire/smoke existence ☐ Site staffed ☐ Some level of access control / fencing ☐ No leachate control ☐ Some equipment for compaction	N/A	☐ Unregistered facilities with distinguishable boundaries ☐ No provisions made for health and safety of workers ☐ No air / water pollution control
c.	Basic (controlled) facility	☐ Waste compacted ☐ Covered with soil ☐ Site staffed ☐ Site fenced and control of access ☐ No fire/smoke existence ☐ Sufficient equipment for compaction and soil cover	☐ Emission controls to capture particulates ☐ Trained staff follow set operating procedures ☐ Equipment maintained ☐ Ash management carried out	☐ Registered facilities with marked boundaries. ☐ Provisions made for health and safety of workers ☐ Necessary air / water pollution control

d.	Improved facility	☐ Waste compacted ☐ Covered with soil ☐ Site staffed ☐ Site fenced and control of access ☐ Leachate containment and treatment (depending on the local climate) ☐ Collection of landfill gas (depending on landfill technology)	N/A	☐ Engineered facilities with effective process control ☐ Evidence of materials extracted being delivered into recycling or recovery markets. ☐ Pollution control compliant to environmental standards
e.	State-of-the-art facility	☐ Waste compacted ☐ Covered with soil ☐ Site staffed ☐ Site fenced and full control of access ☐ Properly sited and designed functional sanitary landfill site ☐ Leachate containment (naturally consolidated clay on the site or constructed liner) ☐ Leachate treatment ☐ Gas collection and flaring and/or utilization ☐ Post closure plan existent	☐ Built to and operating in compliance with international best practice including e.g. EU or other similarly stringent stack and GHG emission criteria ☐ Emission control is conducted compliant to environmental standards ☐ Fly-ash managed as a hazardous waste using best available technology ☐ High energy conversion efficiency meeting European 'R1' or similar standard	☐ Built to and in compliance with international best practice ☐ Nutrient value of biologically treated materials utilized (e.g. in agriculture/horticulture) ☐ Materials extracted with high purity and delivered into recycling markets

More detailed qualitative assessment of the degree of management control of MSW facilities is helpful to identify and stimulate performance improvement. The qualitative assessment is based on the internationally recognised 'Wasteaware ISWM Benchmark Indicators' (or WABIs). The WABIs use six sub-indicators (2E1-6) to carry out a balanced assessment of the overall management performance of waste management facilities.

Survey Sheet Example for Recycling and Treatment Facilities

Treatment facility name	Degree of control score	Process employed	Type of waste	Amount of solid waste received	Amount of sewage sludge	Amount of residue	Residue is exported where
	(1) (2) (3)			(t)	(t)	(t)	
	(1) (2) (3)			(t)	(t)	(t)	

Survey Sheet Example for Disposal Facilities

Landfill sites name	Landfill type	Operation start year	Degree of control score	Amount of MSW received	Amount of sewage sludge received
			(1) (2) (3)	(t)	(t)
			(1) (2) (3)	(t)	(t)

Data Disaggregation

Data for this indicator can be disaggregated at the city and town level:

- Disaggregation by population (waste generation per capita)
- Disaggregation by type of facility
- Disaggregation by material type, i.e., by municipal sewage network and treatment, municipal construction and demolition waste and any other

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Contact International Organization for Global Monitoring

United Nations Human Settlements Programme (UN-Habitat)

19: Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities

Definition and concepts:

The indicator measures the portion of the land in a city that is open space for public use for all, by sex, age, and persons with disabilities. Some of the key terms used in the metadata of this indicator are: built-up area, cities, open spaces for public use, etc.[41]

a) City as defined by the area covered by the built-up and urbanized open space, this is its Urban extent. This definition is utilizes the analysis of satellite imagery to define the boundary of the city morphologically – based on the density of structures. This definition of city includes residential areas, non-residential zones, open spaces such as parks and small amounts of undeveloped land.

b) Urban extent is defined as the total area occupied by the built-up area and the urbanized open space. The built-up area is that which is occupied by buildings and other impervious surfaces.
Landsat imagery[42] is used to identify and classify the built-up pixels into 3 types depending on the share of built-up density (urban-ness) in a 1-km^2 circle of a given building (walking distance radius of about 564 meters around a given building):
   - Urban built-up area: pixels where the walking distance circle has a built-up density greater than 50%.
   - Suburban built-up area: pixels where the walking distance circle has a built-up density between 25%-50%.
   - Rural built-up area: pixels where the walking distance circle has a built-up density of less than 25% and that are not on subdivided land.

   The urbanized open space is classified into 3 types:

   - Fringe open space consists of all open space pixels within 100 meters of urban or suburban pixels;
   - Captured open space consists of all open space clusters that are fully surrounded by urban and suburban built-up pixels and the fringe open space pixels around them, and that are less than 200 hectares in area; and
   - Rural open space consists of all open spaces that are not fringe or captured open spaces.

c) **Public space**: The Global Public Space toolkit defines Public Space as all places that are publicly owned or of public use, accessible and enjoyable by all, free and without a profit motive. Public spaces are categorized into streets, open spaces and public facilities. Public space in general is defined as the meeting or gathering places that exist outside the home and workplace that are generally accessible by members of the public, and which foster resident interaction and opportunities for contact and proximity. For measurement, the elements which can be considered as open public space include:

[41] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened.
[42] Landsat Imagery is made up of several spectral bands that can be used to identify impervious surfaces roughly corresponding to built-up areas, making it possible to classify them by human-assisted algorithms into several classes with a high degree of accuracy.

- **Parks**: Open space inside an urban territory that provide free air recreation and contact with nature, substantial part of which is green area.
- **Recreational areas**: public areas used for recreation that contribute to environmental preservation, such as playgrounds, riverfronts, waterfronts, public beaches, etc.
- **Civic parks**: Open space created because of building agglomeration around an open area, which was later transformed into a representative civic area. They are characterized by considerable nature, specifically gardens and a good place for cultural events and passive recreation.
- **Squares and Plazas**: Open spaces created by the layout of buildings around an open area. Squares are usually public spaces relevant to the city due to their location, territorial development, or cultural importance.

d) **Streets** are roads within towns, cities and neighbourhoods most commonly lined with houses or buildings used by pedestrians or vehicles in order to go from one place to another in the city, interact and to earn a livelihood. The main purpose of a street is facilitating movement of traffic and enabling public interaction. Street space includes: Streets, avenues and boulevards, pavements, passages and galleries, Bicycle paths, sidewalks, traffic island, tramways and roundabouts.

e) **Land allocated to streets** refers to the total area of urban surface that is occupied by all forms of streets (as defined above) at the time of data collection and excludes proposed networks.

Rationale:

This indicator is linked to theme 1.1.1.4 "Ensure access to public spaces including streets, sidewalks and cycling lanes" in the Guidelines for Reporting on the Implementation of the New Urban Agenda. In the New Urban Agenda, Member States articulated a vision of cities that "prioritize safe, inclusive, accessible, green and quality public spaces that are friendly for families, enhance social and intergenerational interactions, cultural expressions and political participation, as appropriate, and foster social cohesion, inclusion and safety in peaceful and pluralistic societies, where the needs of all inhabitants are met, recognizing the specific needs of those in vulnerable situations".[43] In this vein, Member States committed to promote safe, inclusive, accessible, green and quality public spaces, and in particular facilitate access for persons with disabilities to public spaces (NUA §36, 37 & 53). This indicator provides a good way to monitor progress towards achieving this commitment.

Public spaces increase the value of property values around them. The UNHABITAT research on 30 cities around the world and found evidence that prosperous cities are those that allocate enough land to street development (with proper layout), and enough intersections[44].

The implementation of SDGs is an opportunity to monitor public spaces internationally in a comparable way. The indicator 11.7.1 aims to monitor successfully the amount of land that is dedicated by cities for public space (open spaces and streets). Cities vary considerably in size, history, development patterns, designs, shapes and citizen's attitudes towards public spaces. Measuring how much public space a city has is only one part of measuring whether residents actually benefit from the space. For more than a decade, UN-Habitat has promoted the use of public space as an implementation and delivery strategy for projects in urban planning, housing and slum upgrading, governance and urban safety, basic services and even post-conflict reconstruction.

[43] New Urban Agenda, page 11

[44] UNHABITAT, Street as Public Spaces-Drivers of Prosperity (2013), https://unhabitat.org/books/streets-as-public-spaces-and-drivers-of-urban-prosperity/

In 2011, UN-Habitat's Governing Council gave a clear opportunity and direction through Resolution 23/4 to consolidate agency-wide work on public space. UN-Habitat's Member States mandated the agency to develop an approach that promotes the role of public space in meeting the challenges of our rapidly urbanizing world, and to coordinate various global partners and experts on public space and to directly assist cities in their initiatives on the public space management and monitoring. The inclusion of a global indicator on public space within the SDGs framework further energised the already ongoing efforts by UN-Habitat.

Cities that develop their public spaces enhance safety and security, create economic opportunity and improve public health, among many benefits. In this vein, UN-Habitat has recommendations on creating better public spaces in cities[45]:

- Secure enough public space in advance
- Plan a system of public spaces
- Reap the benefits of well-designed streets
- Plan green public spaces

Comments and limitations:

A major challenge for local monitoring of this indicator is the maintenance, application and consistent use of universally accepted definitions, which generally do not consider existing operational/functional administrative boundaries. Urbanization has over the past two decades has resulted in big urbanized areas which extending beyond existing administrative urban area boundaries, the local operationalization and management of urban systems remain within defined authorities. These authorities are often in charge of provision of basic services, building permit issuance, zoning and other development control. While some countries have adopted dynamic administrative structures for their urban areas (which shift with expansions in built-up areas), others have maintained confined boundaries. Some of the most common types of boundaries include city, municipality, local authority, metropolitan area; all of which are set and defined based on governance and service delivery structures.

UN-Habitat has developed tools, programmes and guidelines to assist cities in measuring and accounting for the available public space in cities. Some cities in the developing world lack formally recognized public spaces that are publicly maintained. A prerequisite to collecting accurate and relevant data is understanding of the current local contexts and primary data collection in collaboration with city authorities and local communities.

In addition, the types of open public space vary across cities. The types of spaces listed in this indicator are the most common open public spaces.

Beyond measuring the amount of open space in public use in cities, this indicator also attempts to capture the quality of the space that may impede its proper use. The qualitative data collected on this indicator strengthens the evidence that an open space exists, and that its public use is guaranteed, to allow city authorities and other stakeholders to further improve its quality and increase its use.

Methodology

Computation Method:
The methodology is a three-step process:

[45] UNHABITAT, "Urban Planning for City Leaders (2013)", https://unhabitat.org/books/urban-planning-for-city-leaders/, pp 40-43

a) Spatial analysis to measure the built-up area of the city;
b) Use of satellite images to identify potential open public spaces, physical verification on the ground to validate data and access the quality of spaces and computation of the total area occupied by the open public spaces;
c) Estimation of the total area allocated to streets;

a. Spatial analysis to measure the built-up area

Built-up areas reflect the presence of people and the various activities that they are engaging in. In general, higher built-up density reflects higher activity and population concentrations. The main focus of monitoring indicator 11.7.1 is the built-up area. The steps to follow to measure this indicator are:

1. Identify cities where the indicator will be computed.
2. Download freely available LANDSAT imagery with low cloud cover for the analysis year. Alternative high-resolution images from other sources can also be used.
3. Classify LANDSAT imagery into built-up, non-built-up, and water using a GIS or image processing software.
4. Assess the level of urban-ness for each of the resultant built-up pixels - This can be achieved through spatial statistics in GIS and/or image processing software. Place a 1-km^2 circle around each built-up pixel and calculate the share of pixels in the circle that are also built-up. If >=50% of the pixels in the circle are built-up, the pixel is classified as Urban. If >=25% and <50% of the pixels in the circle are built-up, the pixel is classified as Suburban. If <25% of the pixels in the circle are built-up, the pixel is classified as Rural.
5. Combine contiguous urban and suburban pixels to form an urban cluster of the built-up area.

b. Spatial analysis to identify potential open public spaces, ground verification and estimate their total area

Map potential open public spaces within the urban boundaries identified in step one above and estimation of their area. Steps to follow to compute this component of the indicator:

1. Utilize inventories of Open Public Spaces, legal documents, land use plans and other official sources of information.
2. For cities no open public spaces inventory, satellite imagery can be used to identify potential open public spaces.
3. Digitize the identified potential open public spaces.
4. Ground verification of potential open public spaces and assessing their quality. UN-Habitat, in consultation with partners, has developed a detailed tool to facilitate the verification of each space and collection of additional data on its quality and accessibility. This tool is freely available and allows for on-site definition/ editing of the space's boundaries. It also contains standard and extended questions which collect data relevant to the indicator, including location of the spaces, their ownership and management, safety, inclusivity and accessibility. Tool is available at https://ee.kobotoolbox.org/x/#IGFf6ubq.
5. Calculate the total area covered by the verified open public spaces.

c. Computation of land allocated to streets (LAS)

Where street data by width and length fields is available/specified, the following methodology could be used:

1. Select only the streets included in the urban extent (or clip streets to the working city boundary)
2. From GIS or alternative software, calculate the total area occupied by each street by multiplying its length with width. Sum all individual street areas to attain the total amount of land occupied all streets within the defined urban area.

An alternative technique for computing land allocated to the streets is utilizes sampling. The Halton sampling sequence is recommended because it generates equidistant points, increasing the degree of sample representativeness. Steps to follow to compute LAS using this method:

1. Using the urban extent boundary identified earlier, generate a Halton sequence of sample points (Halton sequence refers to quasi-random sequence used to generate points in space that are ex-post evenly spread i.e. equidistant). The number of points used for each city varies based on its area. In large study areas of more than 20 km2, a density of one circle per hectare is used while in small study areas of less than 20 km2 a density of one circle per two hectares is used.
2. Buffer the points to get sample areas with an area of 10 hectares each.
3. Within each 10-hectare sample area, digitize all streets in GIS software and compute the total amount of land they occupy.
4. Calculate the average land allocated to streets for all sample areas using the formula:

$$\text{The land allocated to streets} = \frac{\text{Sum of LAS from all sampling points}}{\text{Number of sampling points}}$$

The final computation of the indicator is done using the formula:

$$\textbf{Share of the built} - \textbf{up area of the city that is open space in public use}(\%)$$

$$= \frac{\textbf{Total surface of open public space} + \textbf{Total surface of land allocated to streets}}{\textbf{Total surface of built up area of the urban agglomeration}}$$

Disaggregation:

- Location (intra-urban)
- Qualities of the open public space (safe, inclusive, accessible, green)
- The share of built-up area that is green open space in public use
- The share of built-up area is universally accessible open space in public use, particularly for disable persons
- Type of human settlements
- Typology of public space.

Data Sources

Sources and collection process:

The main sources of data are satellite imagery from open sources, documentation outlining publicly owned land and community-based maps.

- For estimating the total surface of Built-up area - Data can be extracted from existing layers of satellite imagery ranging from open sources such as Google Earth, US Geological Survey/NASA Landsat imagery and Sentinel Imagery to higher resolution land cover data sets and commercial imagery. Images are to be analyzed for the latest available year.
- For the Inventory of open public space - Information can be obtained from legal documents outlining publicly owned land and well-defined land use plans. In some cases, where this information is lacking

(incomplete or outdated): open sources, key informants in the city and community-based maps, can be a viable alternative.

- It is not possible to determine the ownership or use of open spaces through remote sensing alone. Fieldwork is essential to validate and verify the open spaces derived from satellite imagery determine whether it is for public and non-public use.

Data Availability

Description:

UN-Habitat has compiled a database on the indicator, which contains data from different sources, including the City Prosperity Initiative, the Atlas of Urban Expansion project, World Cities Culture Forum, outputs from city specific piloting initiatives by the Global Public Spaces Programme (GPSP) and other sources. A data collection process at the city and country level has also been initiated by the GPSP, through which countries are submitting data on the indicator to the agency. So far, about 94 countries have provided data on the indicator. In addition, UN-Habitat has initiated a data validation process, which involves collating all the available data and sharing it with countries for review and verification.

Table 1. Global set of countries and cities with public space data available

Region	**Cities covered as of August 2019**	**Countries covered as of August 2019**
Australia and New Zealand	29	2
Central Asia and Southern Asia	75	8
Eastern Asia and South-eastern Asia	101	12
Latin America and the Caribbean	48	14
Northern America and Europe	94	20
Oceania excluding Australia and New Zealand	1	1
Sub-Saharan Africa	109	19
Western Asia and Northern Africa	47	11
Total	**504**	**87**

Source: UN-Habitat: Global Urban Observatory database 2019.

Data collection and release calendar:

The monitoring of the indicator can be repeated at regular intervals of 3-5 years, allowing for four reporting points until the year 2036. However, annual updates to the existing database will be done and hence data releases based on annual updates will be available every year. Monitoring in 3-5-year intervals will allow cities to determine whether the shares of open public space in the built-up areas of cities are increasing significantly over time, as well as deriving the share of the global urban population living in cities where the open public space is below the acceptable minimum.

Data compilers

UN-Habitat is the lead agency on the global reporting for this indicator and as such, has over the last two years coordinated the efforts of various partners, on methodological developments and piloting of data collection. Key

among these partners have included National Statistical Offices, New York University, ESRI, FAO, UNGGIM, UCLG, Local government departments, the European Commission, UN regional commissions, KTH University-Sweden,

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- UN-Habitat (2015) Global Public Space Toolkit from Global Principles to Local Policies and Practice

20: Does the country have a National Urban Policy or Regional Development Plan that (a) responds to population dynamics, (b) ensures balanced territorial development, and (c) increase in local fiscal space.

Definition:

The indicator seeks to determine whether a country has a National Urban Policy or Regional Development Plan that takes into account changes in population, treats all geographical areas evenly in allocation of development activities and encourages local fiscal autonomy.

Rationale:
This indicator is used to monitor Target 11.a: Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning. However, in the context of the New Urban Agenda, the monitoring period is 2016 to 2036.

The New Urban Agenda calls for participatory urban policies and mainstreaming sustainable urban and territorial development as part of integrated development strategies and plans. In this vein, it invited the United Nations system, development partners, international and multilateral financial institutions, the private sector and other stakeholders to coordinate their urban and rural development strategies. It also calls for coherent policy frameworks and fiscal decentralization processes, so that adequate capacities are developed at all levels (NUA §82, 86 and 130).

Methodology

Means of verification: SDG reports (this had been reported since 2017), and Global report on National Urban Policies.

Disaggregation:
Data to be provided at national level.

Data Sources

The Ministry selected by the government as the focal point for this indicator. SDG reports (this had been reported since 2017), and Global Report on National Urban Policies.

Collection process:
National focal points should send a copy of the information on this indicator to UNHABITAT-GUO, unhabitat-guo@un.org.

Data Availability

The monitoring of the indicator can be annual until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compiler

UNHABITAT

21: Material Footprint, material footprint per capita, and material footprint per GDP

Definition:
Material Footprint (MF) is the attribution of global material extraction to domestic final demand of a country. The total material footprint is the sum of the material footprint for biomass, fossil fuels, metal ores and non-metal ores[46].

Rationale:
This indicator will be used to monitor progress of under the theme "Sustainable Management and Use of Natural Resources" and category 1.3.2.1 "Strengthen the sustainable management of natural resources in urban areas". Member States committed themselves to facilitating the sustainable management of natural resources in cities and human settlements while protecting and improving the urban ecosystem and environmental services, reducing greenhouse gas emissions and air pollution and promoting disaster risk reduction and management and enabling economic development (NUA §65). Material footprint of consumption reports the amount of primary materials required to serve final demand of a country and can be interpreted as an indicator for the material standard of living/level of capitalization of an economy. Per-capita MF describes the average material use for final demand.

This indicator is for monitoring the sustainable management and efficient use of natural resources, however in the context of NUA the monitoring will go on up to 2036.

Concepts:
Domestic Material Consumption (DMC) and MF need to be looked at in combination as they cover the two aspects of the economy, production and consumption. The DMC reports the actual amount of material in an economy, MF the virtual amount required across the whole supply chain to service final demand. A country can, for instance have a very high DMC because it has a large primary production sector for export or a very low DMC because it has outsourced most of the material intensive industrial process to other countries. The material footprint corrects for both phenomena.

Comments and limitations:
The global material flows database is based on country material flow accounts from the European Union and Japan and estimated data for the rest of the world.

Methodology

Computation Method:

It is calculated as raw material equivalent of imports (RME_{IM}) plus domestic extraction (DE) minus raw material equivalents of exports (RME_{EX}). For the attribution of the primary material needs of final demand a global, multi-regional input-output (MRIO) framework is employed. The attribution method based on I-O analytical tools is described in detail in Wiedmann et al. 2015. It is based on the EORA MRIO framework developed by the University of Sydney, Australia (Lenzen et al. 2013) which is an internationally well-established and the most detailed and reliable MRIO framework available to date.

Disaggregation:

The MF indicator can be disaggregated to four main material categories, a varying number of economic sectors whose expenditure require materials and to three domestic final demand sectors (household consumption, government consumption and capital investment) and foreign final demand (i.e. exports).

[46] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened.

Treatment of missing values:

- At country level

A zero is imputed when no positive real value was officially recorded, in the base data sets used, for any of the underlying components which make up this aggregated total. Thus "0.0" can represent either NA, or a genuine 0.0, or (crucially) a combination of both, which is a common situation. This allows for values to be easily aggregated into further aggregations; however, it should be thus noted that due to imputing missing values as '0.0', the aggregations may represent a lower value than actual situation.

- At regional and global levels

Similarly, missing values are imputed as zero in the regional and global aggregations. However, in the case where no data is available at all for a particular country then the per capita and per GDP estimates are weighted averages of the available data.

Regional aggregates:
See: http://uneplive.unep.org/media/docs/graphs/aggregation_methods.pdf

Sources of discrepancies:

Data Sources

Description:
The global material flows database is based on country material flow accounts from the European Union and Japan and estimated data for the rest of the world. Estimated data is produced on the bases of data available from different national or international datasets in the domain of agriculture, forestry, fisheries, mining and energy statistics. International statistical sources for DMC and MF include the IEA, USGS, FAO and COMTRADE databases.

Collection process:
The International Resource Panel of the United Nations Environment Programme compiles the data from countries and from other sources.

Data Availability

Description:
The data covers more than 170 countries. The data set covers each nation individually from 1970 to 2017.

Data compilers

UNEP, OECD and EUROSTAT

References

EUROSTAT (2013). Economy-wide material flow accounts. Compilation Guide 2013.
Wiedmann, T., H. Schandl, M. Lenzen, D. Moran, S. Suh, J. West, K. Kanemoto, (2013) The Material Footprint of Nations, Proc. Nat. Acad. Sci. Online before print.
Lenzen, M., Moran, D., Kanemoto, K., Geschke, A. (2013) Building Eora: A global Multi-regional Input-Output Database at High Country and Sector Resolution, Economic Systems Research, 25:1, 20-49.

22: Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP[47]

Concepts and definitions

Definition:
Domestic Material Consumption (DMC) is a standard material flow accounting (MFA) indicator and reports the apparent consumption of materials in a national economy.

Rationale:
This is another indicator under the theme "Sustainable Management and Use of Natural Resources" and category 1.3.2.1 "Strengthen the sustainable management of natural resources in urban areas". It is also based on the commitment to facilitate the sustainable management of natural resources in the economy (NUA §65). DMC reports the amount of materials that are used in a national economy. DMC is a territorial (production side) indicator. DMC also presents the amount of material that needs to be handled within an economy, which is either added to material stocks of buildings and transport infrastructure or used to fuel the economy as material throughput. DMC describes the physical dimension of economic processes and interactions. It can also be interpreted as long-term waste equivalent. Per-capita DMC describes the average level of material use in an economy – an environmental pressure indicator – and is also referred to as metabolic profile.

This indicator is also for monitoring the sustainable management and efficient use of natural resources, and in the case of NUA the monitoring will go on up to 2036.

Concepts:
Domestic Material Consumption (DMC) and MF need to be looked at in combination as they cover the two aspects of the economy, production and consumption. The DMC reports the actual amount of material in an economy, MF the virtual amount required across the whole supply chain to service final demand. A country can, for instance have a very high DMC because it has a large primary production sector for export or a very low DMC because it has outsourced most of the material intensive industrial process to other countries. The material footprint corrects for both phenomena.

Comments and limitations:
DMC cannot be disaggregated to economic sectors which limits its potential to become a satellite account to the System of National Accounts (SNA).

Methodology

Computation Method:
It is calculated as direct imports (IM) of material plus domestic extraction (DE) of materials minus direct exports (EX) of materials measured in metric tonnes. DMC measures the amount of materials that are used in economic processes. It does not include materials that are mobilized in the process of domestic extraction but do not enter the economic process. DMC is based on official economic statistics and it requires some modelling to adapt the source data to the methodological requirements of the MFA. The accounting standard and accounting methods are set out in the

[47] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened.

EUROSTAT guidebooks for MFA accounts. MFA accounting is also part of the central framework of the System of integrated Environmental-Economic Accounts (SEEA).

Disaggregation:

The DMC indicator can be disaggregated into imports, domestic extraction and exports by a large number of material follow categories. At the highest level of aggregation biomass, fossil fuels, metal ores and non-metallic minerals are distinguished. DMC is usually reported for 11 material categories, DE for 44 material categories.

Treatment of missing values:

- At country level

A zero is imputed when no positive real value was officially recorded, in the base data sets used, for any of the underlying components which make up this aggregated total. Thus "0.0" can represent either NA, or a genuine 0.0, or (crucially) a combination of both, which is a common situation. This allows for values to be easily aggregated into further aggregations; however, it should be thus noted that due to imputing missing values as '0.0', the aggregations may represent a lower value than actual situation.

- At regional and global levels

Similarly, missing values are imputed as zero in the regional and global aggregations. However, in the case where no data is available at all for a particular country then the per capita and per GDP estimates are weighted averages of the available data.

Regional aggregates:

See: http://uneplive.unep.org/media/docs/graphs/aggregation_methods.pdf

Data Sources

Description:
The global material flows database is based on country material flow accounts from the European Union and Japan and estimated data for the rest of the world. Estimated data is produced on the bases of data available from different national or international datasets in the domain of agriculture, forestry, fisheries, mining and energy statistics. International statistical sources for DMC and MF include the IEA, USGS, FAO and COMTRADE databases.

Collection process:

The IRP Global Material Flows and Resource Productivity working group compiles the data from countries and from other sources.

Data Availability

Description:
The data covers more than 170 countries. The data set covers each nation individually from 1970 to 2017.

Calendar

Data providers

National Statistical Offices

Data compilers

UNEP, OECD and EUROSTAT

References:

EUROSTAT (2013). Economy-wide material flow accounts. Compilation guide 2013.
Wiedmann, T., H. Schandl, M. Lenzen, D. Moran, S. Suh, J. West, K. Kanemoto, (2013) The Material Footprint of Nations, Proc. Nat. Acad. Sci. Online before print.
Lenzen, M., Moran, D., Kanemoto, K., Geschke, A. (2013) Building Eora: A global Multi-regional Input-Output Database at High Country and Sector Resolution, Economic Systems Research, 25:1, 20-49.

23: National recycling rate, tons of material recycled

Definition

Proportion of material recycled in the country plus quantities exported for recycling out of total waste generated in the country, minus material imported intended for recycling.

Rationale

This indicator will be used to monitor progress under the theme "Sustainable Management and Use of Natural Resources" under category 1.3.2.2 "Promote resource conservation and waste reduction, reuse and recycling". In the New Urban Agenda (NUA §74), Member States committed to promoting environmentally sound waste management by reducing, reusing and recycling waste, minimizing landfills, reducing marine pollution and converting waste to energy when that choice delivers the best environmental outcome. For purposes of monitoring the New Urban Agenda, in addition to computing the indicator at the country level, it highly desirable to compute it at city level and national urban level.

Good integrated and sustainable (solid) waste management (ISWM) involves: maintaining healthy conditions for residents in cities through a good waste collection and disposal services; protection of the environment throughout the waste chain, especially during treatment and disposal; and proper resource management: by returning both materials and nutrients to beneficial use, through preventing waste and achieving high rates of organics recovery, reuse and recycling. Good resource management involves the "3Rs": reduce, reuse and recycle. Recycled materials can be returned to industrial value chains where they are inputs in national, regional and global production.

Recycling saves cities money and provides employment, for instance, informal and microenterprise sectors handled as much as 27% of waste generated in Delhi, providing employment and also saving the City money that the city would have to contractors to collect and dispose of an additional 1800 tonnes of waste every day[48].

Concepts

Recycling is one of four ways recovery operations. Recovery is any waste management operation that diverts waste material from the waste stream which results in a certain product with a potential economic or ecological benefit. Recovery refers to the following operations[49]:

1. Material recovery is "recycling"[50];
2. Energy recovery is "re-use as fuel";
3. Biological recovery: includes composting and methanisation;
4. Re-use: any end-of-life products and equipment or its components (e.g. electrical and electronic equipment) are used for the same purpose for which they were produced.

[48] UN-Habitat (2010). *Solid Waste management in the World Cities Water and Sanitation in the World's Cities*, Earthscan, London, ISBN 978-1-84971-169-2 http://mirror.unhabitat.org/pmss/listItemDetails.aspx?publicationID=2918, page XIX.

[49] ibid

[50] Note that waste material undergoing internal recycling, i.e., directly at the place of generation, is excluded as it does not enter the waste cycle.

The concepts of recovery and recycling necessitate delineation of when a waste stops being waste. The EU Waste Framework Directive specifies that waste stops being waste when it has undergone a recovery operation[51].

Method of Computation and Other Methodological Considerations

Computation Method:
SDG 12.5.1 comprises of quantitative sub-indicators as follows:

Proportion of municipal solid waste recycled

Equation 1

$$x = \frac{\text{Municipal plastic waste recycled}}{\text{Total municipal plastic waste generated by the city}} \times 100\ (\%)$$

Equation 2

$$x = \frac{\text{Municipal glass waste recycled}}{\text{Total municipal glass waste generated by the city}} \times 100\ (\%)$$

Equation 3

$$x = \frac{\text{Municipal metal waste recycled}}{\text{Total municipal metal waste generated by the city}} \times 100\ (\%)$$

Equation 4

$$x = \frac{\text{Municipal paper waste recycled}}{\text{Total municipal paper waste generated by the city}} \times 100\ (\%)$$

When disaggregation is not feasible, utilize the following formula:

Equation 5

$$x = \frac{\text{Municipal solid waste recycled}}{\text{Total municipal solid waste generated by the city}} \times 100\ (\%)$$

Total municipal solid waste (MSW) generated (the denominator same as for indicator 18 (SDG-11.6.1)) by the city can be estimated by multiplying the municipal solid waste generated per capita with the population of the city. When the

[51] United Nations Statistics Division, "Manual on the Basic Set of Environment Statistics of the FDES 2013", Generation and Management of Waste chapter, page 30, https://unstats.un.org/unsd/environment/FDES/MS_3.3.1_3.3.2_Waste.pdf

MSW generation per capita is not available, a survey to determine the daily waste generation in households and other institutions (e.g. restaurants, hotels, hospitals, schools, etc.) should be conducted.

Data Sources and Collection Method

Total MSW Generation in the City:
Total MSW Recycled:

More detailed qualitative assessment of the degree of management control of MSW facilities is helpful to identify and stimulate performance improvement. The qualitative assessment is based on the internationally recognised 'Wasteaware ISWM Benchmark Indicators' (or WABIs). The WABIs use six sub-indicators (2E1-6) to carry out a balanced assessment of the overall management performance of waste management facilities.

Survey Sheet Example for Recycling and Treatment Facilities

Treatment facility name	Degree of control score	Process employed	Type of waste	Amount of solid waste received	Amount of sewage sludge	Amount of residue	Residue is exported where
	(1) (2) (3)			(t)	(t)	(t)	
	(1) (2) (3)			(t)	(t)	(t)	

National statistical offices will get the data from the local authorities and then aggregate to get recycling rates for urban areas countrywide.

Data Disaggregation

- Data for this indicator can be disaggregated at the city and town level or locations in a city
- Disaggregation by population (tons recycled per capita)
- Disaggregation by material type, i.e., paper, plastic, glass, metal

It is important to disaggregate because recycling rates vary greatly by type of material. Plastic waste has a very negative impact of on the environment, especially on marine life. Hence, it is crucial to know progress in reducing plastic waste.

References

Official SDG Metadata URL: https://unstats.un.org/sdgs/metadata/files/Metadata-12-05-01.pdf (not yet available)

Other references:
United Nations Statistics Division, "Manual on the Basic Set of Environment Statistics of the FDES 2013", Generation and Management of Waste chapter, page 29 - 30 , https://unstats.un.org/unsd/environment/FDES/MS_3.3.1_3.3.2_Waste.pdf

UN-Habitat (2010). *Solid Waste management in the World Cities Water and Sanitation in the World's Cities*, Earthscan, London, ISBN 978-1-84971-169-2 http://mirror.unhabitat.org/pmss/listItemDetails.aspx?publicationID=2918

UN Environment (2015) *Global Waste Management Outlook*, ISBN: 978-92-807-3479-9 http://web.unep.org/ourplanet/september-2015/unep-publications/global-waste-management-outlook

United Nations Statistics Division/United Nations Environment Programme *United Nations Statistics Division/United Nations Environment Programme Questionnaire on Environment Statistics,* https://unstats.un.org/unsd/envstats/questionnaire

United Nations Statistics Division, UNSD Environmental Indicators, https://unstats.un.org/unsd/envstats/qindicators

International Solid Waste Management Association (2015) *Roadmap to Closing Waste Dumpsites the World's Most Polluted Places* http://www.iswa.org/fileadmin/galleries/About%20ISWA/ISWA_Roadmap_Report.pdf Accessed on 26 November 2016

Wilson et al - Wasteaware ISWM indicators - doi10.1016j.wasman.2014.10.006 - January 2015

Wilson_et_al_Supplementary_information_Wasteaware_ISWM_Benchmark_Indicators_User_Manual_Online

Contact International Organization for Global Monitoring

UNSD, UNEP

24: Proportions of positions (by age group, sex, persons with disabilities and population groups) in public institutions (national and local), including (a) the legislatures; (b) the public service; and (c) the judiciary, compared to national distributions[52].

Definition:

This metadata sheet is focused only on the first sub-component of indicator 16.7.1, namely on positions in national legislatures / city council held by women (sex and age,).

The legislative / city council sub-component of indicator 16.7.1 aims to measure how representative of the general population are the individuals occupying key decision-making positions in national legislatures / city council. More specifically, this indicator measures the proportional representation of various demographic groups (women, age groups) in the national population amongst individuals occupying the following positions in national legislatures / city council: (1) Members, (2) Speakers and (3) Chairs of permanent committees in charge of the following portfolios: Foreign Affairs (national legislature only), Defence (national legislature only), Finance, Human Rights and Gender Equality. Furthermore, it looks at the electoral and constitutional provisions adopted by countries to secure representation in national legislatures of persons with disabilities and contextually relevant population groups.

Rationale:

The New Urban Agenda calls for achievement gender equality and empower all women and girls by ensuring women's full and effective participation and equal rights in all fields and in leadership at all levels of decision-making[53] and addressing of to addressing multiple forms of discrimination faced by women and girls, as well as other vulnerable population groups (NUA §20). This indicator is monitoring section 2.1.6 of the Guidelines for Reporting on the Implementation of the New Urban Agenda, which is on "Promote women's full participation in all fields and all levels of decision-making".

The concept of representation

There are different approaches to the concept of representation in parliament, with two of the most widely known being descriptive and substantive representation (Bird, 2003; Floor Eelbode, 2010). Descriptive representation is concerned with the extent to which the composition of parliament mirrors the various socio-demographic groups in the national population. Substantive representation, meanwhile, is concerned with the extent to which parliament acts in the interest of certain population groups (irrespective of whether or not members of parliament consider themselves as members of those groups).

Indicator SDG 16.7.1 focuses on descriptive representation. The underlying assumption is that when parliament / city council reflects the social diversity of a nation / city, this may lead to greater legitimacy of the parliament in the eyes of the electorate or the residents of a city, as members resemble the people they represent in respect to gender and age. Descriptive representation has been found to be associated with higher levels of trust in public institutions, as people feel closer to elected representatives who resemble them and perceive more visibly representative political

[52] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened.
[53] New Urban Agenda page 5

bodies with better quality and fairness of policy decisions, and with less undue influence of vested interests over decision-making.[54] Such descriptive representation should then enhance the substantive influence of population groups. This Monitoring Framework focuses on women and girls for purposes of monitoring the New Urban Agenda,

The methodology for this indicator measures representation in parliamentary decision-making with respect to the sex and age of members of parliament. It identifies the extent to which the proportion of women members of parliament, and the proportion of young members of parliament, corresponds to the proportion of these groups in society as a whole.

A different approach is taken with regard to disability and population group status, which focuses on electoral and constitutional provisions guaranteeing the representation of persons with disabilities and various population groups in national parliaments (see 'Comments and limitations').

'Decision-making positions' in national parliaments / city councils

Target 16.7 focuses on 'decision-making' and the extent to which it is responsive, inclusive, participatory and representative. For the purpose of this indicator, three positions were identified for their importance in decision-making and leadership: Members of parliament, the Speaker of parliament and permanent committee Chairs. Broadly speaking, the decision-making power of individuals holding these positions can be described as follows:

- *Members of parliament* play important roles in public decision-making by voting on laws and holding the government to account.
- *The Speaker* of a legislature presides over the proceedings of parliament and typically plays a significant role in setting the parliamentary agenda and organizing the business of parliament. The Speaker is responsible for ensuring parliamentary business is conducted fairly and effectively, and for protecting the autonomy of the legislature in relation to the other branches of government.
- *Committee Chairs* preside over the work of parliamentary committees, and typically have great influence over the committee agenda and business, including the legislative and oversight work carried out. In addition, committee Chairs often participate in the management boards or bureau that guide the overall work of parliament. As the number and mandates of permanent committees vary between parliaments, for the sake of better quality data and greater comparability, this indicator only considers five Permanent Committees: Foreign Affairs, Defence, Finance, Human Rights and Gender Equality (see 'Comments and limitations').

In the case of city councils, the important decision-making individuals are: The Mayor is considered the head of the city; and the city council committee chairs

Political representation and disaggregation dimensions

[54] See OECD (2017)

The indicator calls for disaggregation of positions by age, sex, contextually relevant population groups and disability status. The following international human rights instruments contain provisions on enhancing opportunities for political participation by individuals and groups holding such characteristics:

The right and opportunity to participate in public affairs

Article 25 of the International Covenant on Civil and Political Rights (ICCPR) recognizes "the right and opportunity, without distinction of any kind such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status to take part in the conduct of public affairs, directly or through freely chosen representatives".

Age

The 2015 Security Council Resolution 2250 urges Member States to consider ways to increase inclusive representation of youth in decision-making at all levels in local, national, regional and international institutions and mechanisms to prevent and resolve conflict and counter violent extremism.

Sex

The 2000 Security Council Resolution 1325 and the six supporting resolutions between 2000-2013 on Women, Peace and Security urge member states to increase the numbers of women at all levels of decision-making institutions. The 1979 Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) provides the basis for realizing equality between women and men through ensuring women's equal access to, and equal opportunities in, political and public life, including the right to vote and to stand for election, as well as to hold public office at all levels of government (Article 7). States parties agree to take all appropriate measures to overcome historical discrimination against women and obstacles to women's participation in decision-making processes (Article 8), including legislation and temporary special measures (Article 4).

Concepts:

The indicator is based on the following key concepts and terms:

- *National legislature:* A legislature (alternatively called 'assembly' or 'parliament') is the multi-member branch of government that considers public issues, makes laws and oversees the executive.
    - *Unicameral / bicameral parliaments:* A legislature may consist of a single chamber (unicameral parliament) or two chambers (bicameral parliament). The organization of a country's legislature is prescribed by its constitution. Around the world, about 59% of all countries have unicameral legislatures, while the remaining 41% are bicameral[55]. To allow for a comprehensive analysis, this indicator will consider both chambers in bicameral parliaments.
- *Member of Parliament (MP):* A person who is formally an elected or appointed member of a national legislature. This metadata considers all members of lower and upper chamber regardless of the selection modality (direct election, indirect election and appointment).
- Speaker: A Speaker (alternatively called 'president' or 'chairperson' of the legislature) is the presiding officer of the legislature.

[55] Source: Structure of Parliaments, IPU New Parline database on national parliaments <https://data.ipu.org/compare?field=country%3A%3Afield_structure_of_parliament#pie>

Comments and limitations:

Measuring representation

- The significance of descriptive representation has been challenged in different ways. First, there is the question of what and who should be mirrored in the representative body; why be attentive to some groups (women, young people etc). One of the base tenets of democracy is freedom of choice at the ballot box and if one is corralled into having to vote for a candidate of your own sex or ethnicity, then that intrinsic liberty is constrained. Third, descriptive representation has the danger of ultimately becoming an end in itself. Concerns about effective representation should not end once parliament has the appropriate number of members for each minority groups. Indeed, at this stage concerns about adequate political representation should be just beginning. These members should be able to articulate minority concerns and have the same opportunities to influence policy as other members. Nevertheless, if a parliament includes none, or very few, women, young people, minorities etc., that is probably a worrying sign that their interests are not being heard. [56]
- Representation needs to go hand in hand with participation, with both concepts being part of target 16.7. Without meaningful opportunities for citizens to participate in parliamentary decision-making, representation alone is unlikely to automatically lead to effective popular control of the government - one of the fundamental principles of democracy (International IDEA, 2013).
- The age and sex of individuals holding decision-making positions in parliament provide an indication at the symbolic level of the way in which power is shared within this institution. However, there is no certainty that because a Speaker or committee Chair is young (or old), a woman (or a man), or belongs to a minority group, s/he will bring to the fore issues of interest to groups with the same socio-demographic profile.
- Tracking the age of MPs over time offers some measure of youth representation in parliament. However, in most parliaments around the world, leadership positions such as Speaker and permanent committee Chairs are considered senior functions which require considerable experience and are awarded in recognition of parliamentary achievement. This means that such positions are by nature unlikely to be held by members below the 'youth' age bracket of '45 years old and under'. As such, for the positions of Speaker and committee Chairs, more relevant insights will be generated on the basis of sex disaggregation.
- IPU studies on women in parliaments[57] have found that committees representing the three 'hard' policy portfolios of Foreign Affairs, Defence and Finance are traditionally male dominated. The two other committees tracked by this indicator, representing cross-cutting portfolios of Human Rights and Gender Equality, are also of interest given their specific areas of focus. Although not found in every parliament, the very existence of these two committees suggests a particular commitment within parliament to safeguarding human rights and promoting gender equality.
- In certain countries, particularly Small Island Developing States, the number of members of parliament may be very small. Consequently, there may not be a committee system, or the committee system may not contain the same distribution by areas of responsibility as observed in the majority of parliaments. In addition, in parliaments with a very small number of members, the addition or reduction of just one or two people to the number of women or the number of young MPs may have a significant impact on the overall percentage of representation of these groups.

[56] IPU and UNDP, "Frequently Asked Questions on the representation of minorities and indigenous peoples in parliament" (2008) in "Promoting inclusive parliaments: The representation of minorities and indigenous peoples in parliament"

[57] See, for example: IPU, "Gender-Sensitive Parliaments" (2011), "Equality in Politics: A Survey of Women and Men in Parliaments" (2008), "Women in Parliament: 20 Years in Review" (2016), "Women in Politics" (2017)

Methodology

- As regards the scope of 'population groups', while representation of minorities and indigenous peoples may be more often tracked by national parliaments due to the availability of internationally accepted definitions, the indicator also invites reporting on any other tracked population groups, including, for instance, occupational groups.
- An obvious limitation of this metadata is that it only considers members of parliament, in keeping with the focus of target 16.7 on 'decision-making'. However, some parliaments may find it useful to also look at the composition of various staff categories such as clerks of the parliament, committee clerks or researchers, etc.
- Who holds the Chairs of parliamentary committees is largely tributary to the overall distribution of seats within the parliament? For example, parliaments with no members under the age of 30 will not have any committee Chairs under that age. Since committee chairs are typically awarded on the basis of experience and seniority,[58] higher age groups are expected to be common among committee Chairs and Speakers.

Data collection

- In between reporting dates, it may be difficult to maintain up-to-date information on the results of by-elections held in selected constituencies to fill vacancies arising from the death or resignation of members.
- From one year to another during any given parliamentary term (typically 4 or 5 years), some Members may fall into a different age group amongst those considered for this indicator. For this reason, age should be reported as that at the time of election to parliament (and in the case of Speakers and permanent committee Chairs, at the time of nomination to a given position).

Recommendations for reporting also on the composition of local parliaments

While at present the indicator looks only at national parliaments, broadening its scope to include legislative bodies of local governments could be considered in the future, in line with target 16.7 which calls for decision-making to be representative "at all levels". Local councils or assemblies hold important decision-making powers, including the ability to issue by-laws that influence the lives of their respective local communities. While it is premature at this stage to propose a global methodology to report on representation in local legislatures due to the varying quality of data collection systems in place at the local level, and to a number of methodological complexities (notably with regards to the need for disaggregated population statistics to be available for each administrative division, in order to compute representation ratios in each local parliament), countries should nonetheless be encouraged to track diversity in local parliaments, using methodologies appropriate to their local context. As far as global SDG reporting is concerned, a recommendation for the future inclusion of local legislatures in indicator 16.7.1(a) can be found in Annex 1 to the Methodology Development Narrative. A custodian for this part of the indicator on local legislatures remains to be identified.

Methodology

Computation Method:

- Members:

[58] See e.g. IPU "Gender-sensitive Parliaments", p. 18 (on committee chairs: "All leaders, irrespective of gender, need to demonstrate their capabilities before they can be accepted as credible and legitimate authority bearers")

Indicator 16.7.1(a) aims to compare the proportion of various demographic groups (by sex and age) represented in national parliaments, relative to the proportion of these same groups in the national population above the age of eligibility.

To report on indicator 16.7.1(a), two ratios must be calculated, namely:

- For 'young' MPs (aged 45 and below)
- For female MPs

When comparing ratios of 'young' MPs and female MPs with corresponding shares of the national population that is aged 45 and below (for the first ratio) and female (for the second ratio), *it is important to consider the population of, or above, the age of eligibility*, the latter being, by definition, the lowest possible age of members of parliament. In other words, if the age of eligibility in a given country is 18 years old, the national population to be used as a comparator for the first ratio (for 'young' MPs) will be the national population aged 18-45 (*not* 0-45), and for the second ratio (for female MPs), the female population aged 18 and above.

1) To calculate the ratio for 'young' MPs (aged 45 and below), the following formula is to be used:

$$Ratio\ 1 = \frac{Proportion\ of\ MPs\ aged\ 45\ and\ below\ in\ parliament}{Proportion\ of\ the\ national\ population\ aged\ 45\ and\ below}$$

(with the age of eligibility as a lower boundary)

Where:

- The numerator is the number of seats held by MPs aged 45 and below, divided by the total number of members in parliament
- $The\ denominator\ can\ be\ computed\ using\ national\ population\ figures\ as\ follows = \frac{[Size\ of\ national\ population <= to\ 45] - [Size\ of\ national\ population < to\ age\ of\ eligibility]}{Size\ of\ the\ national\ population}$

The resulting ratio can then be interpreted as follows:

- 0 means no representation at all of 'youth' (45 years and below) in parliament
- 1 means perfectly proportional representation of 'youth' (45 years and below) in parliament
- <1 means under-representation of 'youth' (45 years and below) in parliament
- >1 means over-representation of 'youth' (45 years and below) in parliament

While a simple proportion of 'young' MPs in parliament is not internationally comparable, a ratio computed using the above formula is. For instance, 48% of 'young' MPs (45 years old or younger) may be an overrepresentation of youth in country A where only 30% of the national population above eligibility age falls in this age bracket (Ratio = 48/30 = 1.6), but in country B where 70% of the national population is 45 years old or younger, the same 48% would be interpreted as under-representation (Ratio = 48/70 = 0.69). In this example, the figure of 48% is not internationally comparable in relation to the national population (it means over-representation in one country and under-representation in another), but the ratios 1.6 and 0.69 *are* internationally comparable. They help us understand whether 48% of MPs aged 45 years old or less is close to, or far from, proportional representation of this age group in the national population.

2) To calculate the ratio for female MPs, the following formula is to be used:

$$Ratio\ 2 = \frac{Proportion\ of\ female\ MPs}{Proportion\ of\ women\ in\ the\ national\ population}$$

(with the age of eligibility as a lower boundary)

Where:

- The numerator is the number of seats held by female MPs, divided by the total number of members in parliament
- The denominator can be computed using national population figures as follows:

[Size of female national population > or = to age of eligibility]

Size of the national population > or = to age of eligibility

Note: This denominator can be set at 50 in most countries, as women generally represent around 50% of the national population in any given age bracket.

The resulting ratio can be:

- 0, when there is no representation of women at all in parliament
- <1, when the proportion of women in parliament is lower than that in the national population
- =1, when the proportion of women in parliament equals that in the national population
- >1, when the proportion of women in parliament is higher than that in the national population

- *Speakers:* No computation, as most parliaments will only have one Speaker per parliament in unicameral parliaments or one Speaker per chamber in bicameral parliaments[59]. Personal characteristics of the individual(s) holding the position of Speaker are recorded (i.e. age group and sex).
- *Chairs of permanent committees on Foreign Affairs, Defence, Finance, Human Rights and Gender Equality:* No computation, as data is collected only on five committee Chairs. Personal characteristics of the five individuals chairing these three committees are recorded (i.e. age group and sex).

Computation in bicameral legislatures

In bicameral parliaments, data will be collected and computed separately for the same set of positions in each chamber.

Disaggregation:

- Sex (Male/Female)

[59] In very rare cases, there are two or more speakers per parliament / chamber. For the sake of clarity and consistency of the analysis, this metadata does not introduce computation for such cases.

- Age: Cut-off age of 45 years of age or younger at the time of election, for members of the current legislature. For the Speaker and permanent committee Chairs, same cut-off age of 45 years of age or younger at the time of nomination to the position.[60]
- Disability: List of electoral or constitutional provisions guaranteeing representation of persons with disabilities in parliament.
- Contextually relevant population groups (e.g. indigenous/linguistic/ethnic/religious/occupational groups): List of electoral or constitutional provisions guaranteeing representation of various population groups in parliament.

Treatment of missing values:

- At country level

There is no treatment of missing values.

- At regional and global levels

There is no imputation of missing values.

Regional / global aggregates:

An internationally comparable scaled value aggregating the two ratios (see section on 'Computation Method' above) on the proportional representation of Members by sex and age must be calculated for this indicator. There is no computation to be made on the data provided on the Speaker and Chairs of the five permanent committees, which are not expressed as proportions.

In case of bilateral parliaments, scaled values will need to be calculated separately for each chamber.

Here is an example of how the computation and subsequent aggregation of the two ratios into a single scaled value can be done:

a) Ratio 1: For 'young' MPs (45 years and below)

Say in country A, 30% of the national population is aged 45 or younger (but above the age of eligibility), but only 25% of MPs fall in this age category:

$$Ratio\ 1 = \frac{Proportion\ of\ MPs\ aged\ 45\ and\ below\ in\ parliament}{Proportion\ of\ the\ national\ population\ aged\ 45\ and\ below}$$

(with the age of eligibility as a lower boundary)

[60] In an attempt to maximize data availability and minimize gaps in submissions of data on age and sex, this indicator is aligned with existing data collection practices of the IPU with regards to age, and adopts IPU's definition of young MPs as those under 45 years old.

Ratio = 0.25 / 0.3 = **0.83**

(<1 since MPs aged 45 or younger are under-represented amongst MPs compared to the proportion of this age group in the national population. The ratio is close to 1 as the share of 'young' MPs is not too far from the corresponding share of the national population falling in this age group.)

b) Ratio 2: For female MPs

Say in the same country A, 10% of seats are held by women MPs (and say we can assume that in country A, women generally represent around 50% of the national population in any given age bracket):

$$Ratio\ 2 = \frac{Proportion\ of\ female\ MPs}{Proportion\ of\ women\ in\ the\ national\ population}$$

(with the age of eligibility as a lower boundary)

Ratio = 0.10 / 0.50 = **0.2**

(<1 since women are under-represented amongst MPs, but this time the ratio is much smaller as sex-based representation in parliament is far from parity.)

c) Calculate the gap between each one of the two ratios and the 'parity score' of 1

Using the above example:

- Gap 1: For 'young' MPs (45 years and below): 1-0.83 = 0.17
- Gap 2: For female MPs: 1-0.2 = 0.8

Important note: *This calculation must be done irrespective of whether ratios are smaller or greater than 1, therefore using absolute values. For example, let's say in a given country 50% of MPs are aged 45 years or below, yet only 35% of the national population falls in this age bracket. Ratio 1 for this country will be 50/35 = 1.43. This ratio is greater than 1 as 'young MPs' are over-represented. Gap 1 would then be calculated as follows:*

- Gap 1: For 'young' MPs (45 years and below): |1-1.43| = |-0.43| = 0.43

And say 60% of seats are held by women in another country. In this country, Ratio 2 will be 60/50 = 1.2. Once again, this ratio is greater than 1 given women are over-represented. Gap 2 would then be calculated as follows:

- Gap 2: For female MPs: |1 – 1.2|= |-0.2| = 0.2

d) Calculate the average of the two gaps

$$\text{Average gap} = \frac{\text{Gap 1} + \text{Gap 2}}{2}$$

Using the above initial example: $\frac{[0.17 + 0.8]}{2} = 0.485$

e) Convert into a 'scaled value' between 0-100

Overall scaled value = [1 – Average gap] x 100

Using the above initial example: [1 – 0.485] x 100 = 0.515 x 100 = **51.5**

This scaled value can be interpreted as follows:

- The closer to 100, the more the composition of parliament mirrors of the social diversity of the country in terms of sex and age (i.e. 100 would mean a mirror image of the proportion of women and people aged 45 and younger in parliament and in society)
- The closer to 0, the less the composition of parliament mirrors the social diversity of the country in terms of sex and age (i.e. 0 would mean no representation of women and no representation of 'youth' aged 45 or younger amongst MPs)

Important notes on the interpretation of the scaled value:

The need to consider both individual ratios and the overall scaled value

Both the overall scaled value **and** the two individual ratios on age-based representation and sex-based representation should be taken into consideration. When a country performs well on the proportional representation of one group (e.g. 'young' MPs, in the above example, where the ratio was 0.83) and poorly or averagely on the proportional representation of another group (e.g. female MPs, in the above example, where the ratio was 0.2), the better representation of one group should not compensate for the poorer representation of another group, nor should the better representation be overlooked due to the poorer representation bringing the overall scaled value down. In the above example, the overall scaled value of 51.5 is average (on a scale of 0-100): the low ratio for female MPs (0.2) has been compensated for by the high ratio for 'young' MPs (0.83). This average scaled value of 51.5 is also hiding the good representation of 'young' MPs, as the lower level of representation of female MPs is bringing the overall scaled value down.

Effect of the age of eligibility for upper chambers on the age ratio and overall scale value

While in many bicameral legislatures, the age of eligibility for the upper chamber is significantly higher than that for the lower chamber, some have adopted an equal or similar age requirement for both chambers.[61] However, regardless of the minimum age of eligibility set for upper chambers, members of these chambers throughout the world are older on average than members of lower chambers (see New Parline). As such, those upper chambers that have a low eligibility age are likely to have a lower ratio for 'young' MPs than upper chambers that have a higher eligibility age. In other words, in upper chambers where the eligibility age is lower, the share of MPs who are 45 or younger is likely to be considerably less than the corresponding proportion of the national population that falls between the eligibility age and 45 years old. In turn, this lower age ratio for upper chambers that have a lower eligibility age will bring down the overall scaled value. This should be kept in mind when contextualizing the age ratio and overall scaled value for upper chambers.

Sources of discrepancies:

There is no internationally estimated data for this indicator.

Methods and guidance available to countries for the compilation of data at national level:

Data on the age and sex of Members, Speakers and Committee Chairs, as well as of electoral or constitutional provisions guaranteeing representation of persons with disabilities and various population groups in parliament, will be reported directly by the IPU. The IPU already compiles this data in the New Parline database on national parliaments (https://data.ipu.org).

New Parline contains data on the composition, structure and working methods of all national parliaments, it was launched in September 2018, as the successor to the Parline database on national parliaments that was established by the IPU in 1996. New Parline contains some 450 different fields, which are collected or updated at varying intervals, depending on the nature of the data. Data is collected by the IPU directly from national parliaments and other official sources (such as electoral commissions). Data is collected using questionnaires and surveys that are distributed via national IPU Groups in parliament (via the Secretary General of non-member parliaments. As at 19 September 2018,

[61] In 41 upper chambers, the age of eligibility is 30 years old or older, and in another 7, it falls between 25-29. In the remaining 26 upper chambers for which such information is collected by the IPU, the age of eligibility is between 18 and 24 years old. Source: New Parline (https://data.ipu.org/compare?field=chamber%3A%3Afield_min_age_member_parl&structure=any__upper_chamber#bar)

the IPU has 177 members; a further 16 national parliaments are not members). Data is then processed by the IPU prior to inclusion in the database. Some fields are updated daily, while others are updated annually, after each election, or when the constitutional or legal powers of parliament are changed. Parliaments are invited to check and update their data at least annually.

Once the methodology for SDG 16.7.1 is upgraded to Tier II, the IPU will inform parliaments that part of the data they provide will be used for the purpose of monitoring this indicator and will provide appropriate guidelines to respondents. In addition, the IPU will extend its data collection to include information on the age and sex of the Chairs of permanent committees on Foreign Affairs, Defence and Finance (data on Chairs of permanent committees on women and human rights is already collected within the scope of New Parline).

Methods and guidance available to countries for the compilation of data at international level:

The Declaration on Parliamentary Openness calls on parliaments to make publicly available information "about the backgrounds, activities and affairs of members, including sufficient information for citizens to make informed judgments regarding their integrity and probity, and potential conflicts of interest."

Inter-Parliamentary Union (IPU)'s "Guidelines for the Content and Structure of Parliamentary Websites" (2000) recommend that for the sake of informing the electorate about Members, official parliamentary websites should feature biodata of the current speaker and a list of members and permanent committee Chairs as recommended minimum. Biodata of members is a much-welcomed optional element.

Quality assurance

Data for the indicator will follow the quality assurance measures put in place by IPU for New Parline database. Data is collected directly from national parliaments. Quality controls and "sanity checks" are carried out by the IPU, using comparison against historical records for the same country and comparison between countries. In the case of any inconsistencies, a dialogue is opened with the parliament to clarify and, where necessary, correct the data. In addition, parliaments are invited to review all of their data on New Parline at regular intervals, at least annually and following elections.

Data Sources

Description:

The multiple data points pertaining to the parliamentary sub-component of indicator 16.7.1 will be compiled by the Inter-Parliamentary Union (IPU) based on information gathered in its New PARLINE database on national parliaments:

Data on age and sex of Members and Speakers:

The IPU already collects data from secretariats of national parliaments on an ongoing basis for New PARLINE. The Platform already provides up-to-date and disaggregated data on the following positions:

- *Members*: data disaggregated by sex and age.
- *Speakers*: data disaggregated by sex and age.

Chairs of permanent committees on Human Rights and Gender Equality: data disaggregated by sex and age.

Data on age and sex of Chairs of permanent committees on Foreign Affairs, Defence and Finance:
Data on the sex and age of Chairs of permanent committees on Foreign Affairs, Defence and Finance is not currently collected but will be incorporated into the existing data gathering process for New Parline, once this indicator is upgraded to Tier II. This is building on the successful attempt made by the IPU in 2011 to collect sex-disaggregated data on committee Chairs, broken down by area of competence (see IPU, Gender-sensitive parliaments, 2011).

Data on age and sex of Council Members and Mayors:

- *Council Members*: data disaggregated by sex and age.
- *Mayors*: data disaggregated by sex and age.
- *Chairs of permanent committees:* data disaggregated by sex and age.

Data on council members will be available at city councils.

Collection process:

The compilation of data by the Inter-Parliamentary Union uses the following mechanisms:

- data collection forms sent to Parliaments[62]
- internal review and validation of data obtained from national parliaments by the IPU
- on-line dissemination of data by IPU on New PARLINE

The IPU will apply the data validation procedures developed for New Parline, plus additional checks specifically for SDG indicator 16.7.1(a), prior to submitting data at the international level for SDG reporting.

Data Availability

Description and time series:

Data on age and sex:

[62] In case of bicameral parliaments, data will be obtained separately from the secretariat of each chamber, except where the two chambers share a secretariat / contact point.

As a general rule, (nearly) all parliamentary secretariats keep records of basic information on all members. While the format and scope of information provided vary, most feature the MPs' date of birth and sex. As such, parliamentary secretariats are the primary source of data for the **age** and **sex** dimensions of this indicator.

The IPU publishes data points on the sex and age of Members, Speakers and committee Chairs for the following number of countries:

- *Members*: Sex-disaggregated data available for parliaments in 193 countries and split between chambers in case of bicameral parliaments. With respect to age disaggregation, the latest data gathering by the IPU was carried out in 2015 in 128 countries across all regions, using the following age cut-offs (30, 40 and 45 years old) for counting 'young' parliamentarians (see IPU, Youth participation in national parliaments, 2016). The New PARLINE database provides information on the number of MPs in each parliament across 10 statistical intervals (age 18-20; age 21-30; age 31-40; age 41-45; age 46-50; age 51-60; age 61-70; age 71-80; age 81-90; age 91 and over) and the percentage of members in two age brackets (age 45 and younger; age 46 and older), with 45 being the cut-off age for 'youth' MPs. From 2014 to 2017, data on the age of parliamentarians was updated using an annual survey. From 2018 onwards, it is updated after every election.
- *Speakers*: Sex and age of Speakers available on New PARLINE for all parliamentary chambers in 193 countries. This data is updated on a daily basis, every time a change occurs.
- *Permanent committee Chairs*: Sex and age of chairs on committees on Human Rights and Gender Equality are featured on New PARLINE. This data is updated after every election. Furthermore, previous studies have provided data on the sex of committee Chairs in 89 parliamentary chambers, broken down by area of competence (see IPU, Gender-sensitive parliaments, 2011).
- In addition, New PARLINE provides information on the age of eligibility in 190 countries (i.e. the age of eligibility will be the cut-off age above which the demographic profile of the national population will be compared to that of members in parliament). This is required for defining the national population to be used as a comparator for the share of 'young' MPs in parliament (see Ratio 1). This data is updated every time a change occurs.
- *National population statistics:* The World Population Prospects 2017 database is the most recent official United Nations population estimates and projections[63]. *World Population Prospects* presents estimates for 233 countries and areas. About half of those countries or areas do not report official demographic statistics with the detail necessary for the preparation of cohort-component population projections, hence this estimation work undertaken by the Population Division in order to close those gaps. Estimates are presented for five-year periods, starting with 1950-1955 and ending with 2010-2015. These statistics are required to calculate the denominator of ratio 1 (see 'Computation Method'):

[63] The Population Division of the Department of Economic and Social Affairs of the United Nations issues a new Revision every two years. The next one is due in the first half of 2019. As explained by the UN Population Division, estimates from the *World Population Prospects* sometimes differ from official statistics as "official demographic statistics are affected by incompleteness of coverage, lack of timeliness and errors in the reporting or coding of the basic information. The analysis carried out by the Population Division takes into account those deficiencies and seeks to establish past population trends by resolving the inconsistencies affecting the basic data. Use of the cohort-component method to reconstruct populations is the major tool to ensure that the population trends estimated by the Population Division are internally consistent." The availability of data gathered by major survey programs, such as the Demographic and Health Surveys or the Multiple-Indicator Cluster Surveys, are useful in generating some of the data that is not currently being produced by official statistics. For more information on the methodology used by the United Nations Population Division to produce the estimates and projections for the *World Population Prospects*, please refer to the publication on Methodology.

- To calculate the “size of national population < or = to 45”, all age groups must be selected from 0-4 to 40-44 (unfortunately, the database does not produce more granular data for individual ages, so those aged 45 will be excluded from the total), for the current year, and for both sexes combined.
- To calculate the “size of national population < to age of eligibility”, all age groups must be selected (for the current year, and for both sexes combined) from 0-4 to the 5-year interval *closest* to the eligibility age (e.g. If the eligibility age is 18 years old, the closest interval will be 15-19, which contains the eligibility age; however if the eligibility age is 21, the closest interval will still be 15-19, and not 20-24, as the first interval is only 2 years ‘short of’ the eligibility age (i.e. 20-21), whereas the second interval is 3 years above the eligibility interval (i.e. 22-23-24).

Calendar

Data collection:

Data should be collected at least once every legislative term (preferably within 6 months of the opening of a new parliament). If possible, data should be updated annually. This will ensure timely capturing of changes in the composition of parliament and/or permanent committees which may come as a consequence of the electoral cycle, snap elections and by-elections held in selected constituencies to fill vacancies arising from the death or resignation of members.

- Sex and age of members: updated after every election
- Sex and age of Speakers: updated on a daily basis, every time a change occurs
- Sex and age of permanent committee Chairs: updated after every election
- Data on electoral or constitutional provisions guaranteeing representation of persons with disabilities and various population groups: updated at the time of every election

In addition, all data will be reviewed and updated annually by parliaments.

Data release:

Data will be reported at the international level in April each year and will provide a snapshot of the situation as at 1 January of that year.

The first full release of data for the indicator will take place in April 2020, on the basis of data as at 1 January 2020.

Throughout 2019, the IPU will have a rolling schedule of publication of parts of the data for the indicator in the New Parline database. For example, data on the sex of members of parliament is already available; whereas data on the age and sex of the Chairs of permanent committees on Foreign Affairs, Defence and Finance could start being collected in January 2018, and published in the database by June 2019.

Data providers

The Inter-Parliamentary Union is responsible for the provision of data on all dimensions of the indicator. Most part of the data is already available on New Parline, directly provided by national parliaments. The few remaining data points (on the age and sex of the Chairs of permanent committees on Foreign Affairs, Defence and Finance) will be added to the Platform once the indicator will be upgraded to Tier II.

Data compilers

The Inter-Parliamentary Union is responsible for the compilation of all data points required by this indicator to compute data on parliamentarians and for the computation of the two ratios and internationally comparable scaled values for each parliamentary chamber of each country. However, data council members can be obtained by city councils.

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25: Fixed Internet broadband subscriptions per 100 inhabitants, by speed

Definition:

The indicator fixed Internet broadband subscriptions, by speed, refers to the number of fixed-broadband subscriptions to the public Internet, split by advertised download speed[64].

The indicator is currently broken down by the following subscription speeds:

- 256 kbit/s to less than 2 Mbit/s subscriptions: Refers to all fixed broadband Internet subscriptions with advertised downstream speeds equal to, or greater than, 256 kbit/s and less than 2 Mbit/s.

- 2 Mbit/s to less than 10 Mbit/s subscriptions: Refers to all fixed -broadband Internet subscriptions with advertised downstream speeds equal to, or greater than, 2 Mbit/s and less than 10 Mbit/s.

- Equal to or above 10 Mbit/s subscriptions (4213_G10). Refers to all fixed -broadband Internet subscriptions with advertised downstream speeds equal to, or greater than, 10 Mbit/s.

Rationale:

By adopting the New Urban Agenda, Member States commit themselves to promoting equitable and affordable access as well as promoting appropriate measures in cities and human settlements that facilitate access to public information and communication (including information and communications technologies and systems) and other facilities in both urban and rural areas. They also committed themselves to encouraging urban-rural interactions and connectivity by strengthening sustainable transport and mobility, and technology and communications networks and infrastructure, based on planning instruments of the integrated urban and territorial approach (NUA §34, 36 and 50).

The Internet has become a major way for accessing information, especially science, technology and innovations. High-speed Internet access is crucial to ensuring that Internet users have good quality access to the Internet, fast download and upload times reduce waiting times for accessing or uploading internet content. Globally, fixed broadband subscriptions have increased from 4.3 per 100 inhabitants in 2006 to 14.1 per 100 inhabitants in 2018 while service providers are offering increasingly higher speeds. Differences in fixed broadband internet affect the quality and functionality of Internet access. Many developing countries have very low fixed-broadband subscriptions rates and very low speeds, which is a barrier to achieving Target 17.6 “Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge-sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism” . The indicator highlights the potential of the high-speed Internet access to improve cooperation and access to science, technology and innovation, and knowledge sharing. It also highlights the importance of Internet use as a development enabler and differences in access to the internet.

In terms of Means of implementation, Member States agreed to promote the development of national information and communications technology policies and e-government strategies, as well as user friendly digital governance tools, in order to make information and communications technologies accessible to the public, including women and girls,

[64] The source of the metadata is https://unstats.un.org/sdgs/metadata/, but it has been shortened.

children and youth, persons with disabilities, older persons and persons in vulnerable situations. They will also encourage the use of digital platforms and tools, including geospatial information systems in order to improve long-term integrated urban and territorial planning and design, land administration and management, and access to urban and metropolitan services (NUA §156).

Concepts:

Fixed Internet broadband subscriptions refer to subscriptions to high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This includes cable modem, DSL, fibre-to-the-home/building, other fixed (wired)-broadband subscriptions, satellite broadband and terrestrial fixed wireless broadband. This total is measured irrespective of the method of payment. It excludes subscriptions that have access to data communications (including the Internet) via mobile-cellular networks. It should include fixed WiMAX and any other fixed wireless technologies. It includes both residential subscriptions and subscriptions for organizations.

The Internet is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Comments and limitations:

Since most Internet service providers offer plans linked to download speed, the indicator is relatively straightforward to collect. Countries may use packages that do not align with the speeds used for this group of indicators. Countries are encouraged to collect the data in more speed categories so as to allow aggregation of the data according to the split shown above. In the future, ITU might start to include higher-speed categories, reflecting the increasing demand and availability of higher-speed broadband subscriptions.

Methodology

Computation Method:

ITU collects data for this indicator through an annual questionnaire from national regulatory authorities or Information and Communication Technology (ICT) Ministries, who collect the data from national Internet service providers. The data can be collected by asking each Internet service provider in the country to provide the number of their fixed-broadband subscriptions by the speeds indicated. The data are then added up to obtain the country totals.
For NUA monitoring purposes, there is need to have the data at city-level as well.

Disaggregation:

Since data for this indicator are based on administrative data from ISPs, no information on individual subscribers is available and therefore the data cannot be broken down by any individual characteristics. Data could in theory be broken down by geographic location, city-level and urban/rural, but ITU does not collect this information.

Treatment of missing values:

- At country level

  Missing values are not estimated (Not applicable).

- At regional and global levels

  Missing values are not estimated (Not applicable).

Regional aggregates:

Not calculated.

Sources of discrepancies:

Differences between global and national figures may arise when countries do not use the same definition for fixed-broadband subscriptions, or when speed tiers differ. Differences for each data point will be explained in a note.

Data Sources

Description:

Since data for this indicator are based on administrative data from operators, no information on individual subscribers is available and therefore the data cannot be broken down by any individual characteristics. Data could in theory be broken down by geographic location and urban/rural, but ITU does not collect this information.

Collection process:

ITU collects data for this indicator through an annual questionnaire from national regulatory authorities or Information and Communication Technology Ministries, who collect the data from Internet service providers.

Data Availability

Data for this indicator exist for about 90 economies (in 2015). However, more countries are expected to provide information on this indicator over the next few years, which will allow ITU to produce regional and global estimates. Data on fixed-broadband subscriptions not broken down by speed are widely available, and regional and global are being produced.

Calendar

Data collection:

Year-end data are released in June of the following year through the ITU World Telecommunication/ICT Indicators Database.

Data release:

June 2016

Data providers

The telecommunication/ICT regulatory authority or the Ministry in charge of ICTs within each country, who collect the data from Internet Service Providers (ISPs).

Data compilers

ITU

References

URL:

http://www.itu.int/en/ITU-D/Statistics/Pages/default.aspx

References:

ITU Handbook for the Collection of Administrative Data on Telecommunications/ICT, 2011, (and revisions and new indicators), https://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-ITC_IND_HBK-2011-PDF-E.pdf

26: Number of days to register a new business in the country

Definition:

One way to identify the ease of starting a business is the number of days it takes a firm to register. Registration must ideally include obtaining all necessary licenses and permits and completing any required notifications, verifications or inscriptions for the company and its employees with the relevant authorities[65]. Unit of measurement is number of days.[66]

Rationale:

The New Urban Agenda calls for development of vibrant, sustainable and inclusive urban economies, resource-efficient and resilient infrastructure, promotion of sustainable and inclusive industrial development and sustainable consumption and production patterns and fostering an enabling environment for businesses and innovation, and livelihoods (NUA §45). This indicator is monitoring section 1.2.1.3 of the Guidelines for Reporting on the Implementation of the New Urban Agenda, which is "Promote an enabling, fair and responsible environment for business and innovation".

A government should provide a conducive environment in the market it regulates as competition improves quality of goods and services, lowers cost for both producers and consumers, and creates facilities for those who want to enter any market. Excessive business regulation affects economic performance and development as it increases the costs of engaging in the formal economy (Doing Business, 2014). A prosperous city should develop regulatory framework that permits an easy entry of any firms in the market.

Methodology:

Days to start a business recorded in calendar days. The measure captures the median duration that incorporation lawyers indicate as necessary to complete all required registration procedures.

Source: Doing Business Indicator and Entrepreneur Surveys

Obtained from the Doing Business ranking[67].

Data Source:

The government should select a focal point in a ministry to provide this information. If that is not possible, then use data is obtained through enterprise surveys made mostly by the World Bank, however the data not available for all cities.

References

Doing Business (2014). Understanding Regulations for Small and Medium-Size Enterprises. 11th Edition. http://documents.worldbank.org/curated/en/115171468330898480/Doing-business-2014-understanding-regulations-for-small-and-medium-size-enterprises

[65] http://www.doingbusiness.org/Methodology/starting-a-business#time , Accessed August 6, 2014.
[66] UNHABITAT, 2016, The City Prosperity Index (CPI) Manual; https://unhabitat.org/wp-content/uploads/2019/02/CPI-METADATA.2016.pdf
[67] http://www.doingbusiness.org/data/exploretopics/starting-a-business , Accessed August 6, 2014.

27: Green Area Per Capita

Definition:

Total green area (square meters (m^2)) within the city (forests, parks, gardens, etc.) per inhabitant.

Rationale:

This indicator is used to monitor progress under the theme "Sustainable Management and Use of natural Resources" and category "Strengthen the sustainable management of natural resources in urban areas". The basis for selecting this indicator are the commitments (including NUA §65) that call for the sustainable management of natural resources in cities and human settlements in a manner that protects and improves the urban ecosystem and environmental services, through environmentally sound urban and territorial planning.

Green areas are defined as public and private areas that have flora such as plants, trees and grass (e.g. forests, parks, gardens). These areas are also a way to compensate for CO2 emissions as green spaces generally generate environmental sustainability. This indicator provides information about the amount of geographical space that the city dedicates to green space. A prosperous city seeks to increase the green areas per capita to have a better air quality and improve the quality of life of its population.

Methodology:

$$Green\ area\ per\ capita\ = \frac{\text{Total green area within a city}}{\text{city population}}$$

Source:

Local urban planning authorities.
Remote sensing imagery can be used to identify intra-urban green areas when no other information is available.

Limitations
Cities located in desert areas have a natural disadvantage; However, it is a duty of the city to guarantee a minimum amount of green space to its population.

References

UNHABITAT, "MEASUREMENT OF CITY PROSPERITY: Methodology and Metadata", 2016, page 84, https://unhabitat.org/wp-content/uploads/2019/02/CPI-METADATA.2016.pdf

Fuller, R. & Gaston, K. (2009). The scaling of green space coverage in European cities. Biology letters, On-line publication: doi:10.1098/rsbl.2009.0010. http://rsbl.royalsocietypublishing.org/content/early/2009/02/22/rsbl.2009.0010.full , accessed June 11, 2014.

Laghai, H. & Bahmanpour, H. (2012). GIS Application in Urban Green space Per Capita Evaluation. Annals of Biological Research, 2012, 3 (5):2439-2446.

28: Population density

Definition

This is defined as the Gross density i.e. the total city population divided by the total urban area in square kilometres. The Unit of measurement is number of People / km^2

Rationale:

High population density makes provision of many public services economically feasible, e.g. mass transit systems. This explains why for many years UNHABITAT has advocated for compact cities. In the New Urban Agenda, Member States committed to encouraging spatial development strategies that prioritize urban renewal by planning for the provision of accessible and well-connected infrastructure and services, sustainable population densities and compact design and preventing urban sprawl (NUA §52). High density has the many economic, social and environmental benefits.

It is possible for a city to have high population density and be prosperous at the same time. Studies show no correlation between high density and crime when factors such as income and class are accounted for. A well-designed and organized high-density neighbourhood can be safe and comfortable, but high-quality design is essential to achieve viable high-density areas (UN-Habitat, 2013). Very high population density is not desirable as it is overcrowding while very low population density is under-utilization of land.

Methodology:

Formula for population density:

$$Population\ density\ = \frac{\text{City Population}}{\text{Urban area}}$$

Data source:
Population data is usually collected by censuses and surveys. The local authorities must carefully mark the boundary of the urban areas (or perimeter). A density of at least 15,000 people per km^2 is optimal to promote high-density urban growth, minimize urban sprawl and optimize land efficiency (UN-Habitat, 2013).

Limitations
Density is often measured as population divided by an administrative boundary, such as, municipal boundaries, this measure of density is not very useful as municipal limits may include a large amount of vacant land or lakes and wide rivers (Bertraud 2004).

In some cities and contexts, it is possible to find functional densities with higher values from the proposed optimum. The higher values of density may vary according to cultural factors and available floor areas per person due to vertical development. Additionally, this indicator does not consider the quality of the urban design, which is essential to achieve high-density built-up areas (UN-Habitat, 2013).

References
UN-Habitat, 2013. Discussion Note 1. Urban Planning. A new strategy of sustainable neighbourhood planning: Five principles[68].
Bertaud, A. 2004. The Spatial Organization of Cities[69]
UNHABITAT, "MEASUREMENT OF CITY PROSPERITY: Methodology and Metadata", 2016, pp 44-45, https://unhabitat.org/wp-content/uploads/2019/02/CPI-METADATA.2016.pdf

[68] http://unhabitat.org/wp-content/uploads/2014/05/5-Principles_web.pdf, Accessed 28 July 2014.
[69] http://alainbertaud.com/wp-content/uploads/2013/06/AB_The_spatial_organization_of_cities_Version_31.pdf

29: Land-use mix

Definition: The diversity of land use per square kilometre, within a city or urban area.

Measurement Unit: Dimensionless (value between 0 and 1.61).

Rationale:

Land use is balanced through complementary uses and activities within a local area, daily trips are short and walkable. This indicator refers to the mix of residences, workplaces and local commerce). Diverse uses' peaking at different times ensures animated and safe local streets that encourage walking and cycling, and fosters a vibrant human environment where people want to live. The location of activities within a city has a huge impact on the levels of economic and social activities. If we consider distance as a function of the location, then the importance of a suitable location has a significant influence on economic activities and land uses, in the specialization of urban space, and therefore the presence of various sectors in the city (Kajtazi, 2007).

Land use characterizes the cityscape, while its spatial distribution determines the structure and organization of the city
(Institute for Transportation and Development Policy, 2013). A prosperous city seeks to distribute the major urban activities to balance its systems and functions.

Methodology:

1. Obtain urban land use map classified as follows: residential, commercial + services, industrial, public facilities, and public spaces. Public facilities are all the institutional structures defined for purposes such as: education, culture, sports and administration. Public spaces include all the open spaces that could be used for recreation such as: parks, public spaces related to the equipment and green zones that are accessible to people.
2. Overlay a regular grid of 500 m x 500 m cell size.
3. Calculate the area allocated to each land use class within each cell.
4. The land allocated to the streets must not be included, which means that this value must be extracted from the total of surface.
5. Calculate the Shannon-Wienner diversity index for each cell j as follows:

$$\text{Shannon-Wienner diversity index}_j = [- \sum_i p_i * \ln(p_i)],$$

Where p_i is the share of each land use class within the cell calculated as the area of each class divided by the total cell unit area (250,000m^2).

6. Calculate the average as follows:

$$\text{Land use mix} = \frac{\sum j \ \text{Shannon–Wienner diversity index}j}{\text{Total number of cells}}$$

Source: Local urban and city planning authorities.

Limitations:

Because this information comes from the regulatory plans, they do not always reflect the reality on the ground. Sometimes urban development is inconsistent with regulatory plans especially in developing countries.

References

Kajtazi, B. (2007) Measuring multi-functionality of urban area. International Institute for Geo-Information Science and Earth Observation, Enschede, the Netherlands[70].
Institute for Transportation and Development Policy (2013) TOD Standard v. 2.0. New York.
UNHABITAT, "MEASUREMENT OF CITY PROSPERITY: Methodology and Metadata", 2016, pp 99-100, https://unhabitat.org/wp-content/uploads/2019/02/CPI-METADATA.2016.pdf

[70] http://www.itc.nl/library/papers_2007/msc/upla/kajtazi.pdf, Accessed June 11, 2014

30: CO2 emissions

Definition:

Total amount of CO2 emissions in a year. Carbon dioxide emissions are those stemming from the burning of fossil fuels. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring (The World Bank, 2014). The unit of measurement is metric tonnes of CO2 per capita

Rationale:

Member States recognized that urban centres including many big cities globally are vulnerable to the adverse impacts of climate change and including extreme weather events, flooding, subsidence, storms, including dust and sand storms, heatwaves, water scarcity, droughts, water and air pollution, vector-borne diseases and sea level rise (NUA §64). The New Urban Agenda calls for countries to adopt and implement disaster risk reduction and management, build resilience and foster mitigation of and adaptation to climate change (NUA §13). Increased volumes of CO2 and other greenhouse gases released by the burning of fossil fuels, land clearing, agriculture, and other human activities, are believed to be the primary sources of the global warming that has occurred over the past 50 years. [2] The New Urban Agenda calls for lower levels of CO2 emissions to improve environmental sustainability and air quality. In this vein, it is crucial to monitor CO2 emissions which are a major cause of global warming.

Global warming is the gradual increase in the average temperature of the Earth's atmosphere and its oceans. It is changing the earth's climate, which has negative adverse effects on the planet and its inhabitants. Some of its effects are [1]:

- Rising ocean temperatures that result in melting glaciers which in turn lead to rising sea levels. The higher sea levels will increase coastal erosion, flooding, and property damage during coastal storms and higher likelihood of loss of life from storms.
- Warmer sea surface temperatures will result in more frequent and stronger tropical storms.
- Higher temperatures will lead to increased incidence of malaria in areas that currently are malaria-free.
- Carbon dioxide (CO2) is the most common greenhouse gas (GHG), its concentration in the atmosphere has increased dramatically over the 18th century (The World Bank, 2014).

Methodology:

One of the most utilized model for measuring greenhouse gas emissions from different sources is the Long range Energy Alternatives Planning System (LEAP) developed at the Stockholm Environment Institute (Heaps, 2008).

The city's local environmental authorities should measure and report the greenhouse gas emissions, which includes CO2 emissions as part of monitoring progress in implementing the New Urban Agenda.
Limitations These calculations usually do not include fuels burning from aircrafts and ships.

Data source:
Local environmental authorities.

References

Bibliographic references
The World Bank (2014). World Development Indicators 1960 – 2013. [3]
Heaps, C. (2008) Long Range Energy Alternatives Planning System: An introduction. Stockholm Environment Institute. [4]

URL references
[1]: http://www.columbia.edu/~vjd1/greenhouse.htm, accessed August 31, 2015
[2]: http://www.livescience.com/topics/global-warming/, accessed August 31, 2015

[3]: http://data.worldbank.org/indicator/EN.ATM.CO2E.PC, accessed June 11, 2014.
[4]: http://www.energycommunity.org/documents/LEAPIntro.pdf, accessed June 11, 2014.
UNHABITAT, "MEASUREMENT OF CITY PROSPERITY: Methodology and Metadata", 2016, pp 107-108, https://unhabitat.org/wp-content/uploads/2019/02/CPI-METADATA.2016.pdf

31: Ratio of the median annual rent of a dwelling unit and the median annual household income of tenants and Ratio of the median free-market price of a dwelling unit and the median annual household income

Definition:

This indicator has two components:

a) median annual rent of a dwelling unit divided by median annual household income of tenants;
b) median free-market price of a dwelling unit divided by median annual household income

Rationale:

Member States committed themselves to develop policies, tools and financing models that create a wide range of affordable and sustainable housing options, including rental and other tenure options, co-housing, community land trusts and other forms of collective tenure. They also committed themselves to implementing urban planning strategies that facilitate integration through the provision of affordable housing options with access to quality basic services and public spaces for all (NUA §99 & 107). The indicator is based on the objective that housing should not take a huge portion of total household income.

Concepts:

Median housing price: Housing price is defined as the price at which a house would sell if placed on the market for a reasonable length of time by a seller who is not under pressure to sell. The median priced house in the urban area is that house which has 50% of the houses priced below it, and 50% of the houses priced above it. The calculation of the price of the median-priced house should, therefore include all housing, both new and old, and both formal and informal. If, for example, the majority of the housing stock is informal, and the informal housing stock is generally cheaper than the formal housing stock, then the median priced house will probably be an informal unit. For blocks of apartments or multiple-family dwellings which are usually sold as a single building, the value of one dwelling unit should be estimated as a pro rata share of the total sale price. This is particularly relevant for countries in Africa where the majority of housing is of this type.

Median rent: Rent excludes utilities such as electricity, heating, water, sewerage charges etc. Median rent might be obtained from household income and expenditure surveys, however if that data is out of date then median rent has to be estimated with ranges of rents estimated separately for different categories such as public housing, controlled rents, one bedroom and two-bedroom furnished and unfurnished apartments, and single-family houses of different types. The median price will be part way up the price ranges of the median dwelling types.

Median household income: Household income is defined as the gross income from all sources, which include wages, salaries, incomes from businesses or informal sector activities, investment income, and where information is available, income in-kind such as consumption of agricultural produce which might have been sold.

Methodology

House price and rent-to-income ratios

city level	Year	2016	20..	
-	Median house price			A
-	Median rent			B
-	Median annual household income			C
-	Median household income of renters			D
	House price / household income			A/C
	House rent / household income			B/D

What changes do these results suggest in terms of housing affordability?

Computation Method:

For the calculation of the rent to income ratio, incomes should be median gross income of private and public renter households. Where renter household income data do not exist, median income of all households can be used.

Disaggregation:

Data to be provided at city level.

Data Sources

Public housing boards, housing finance institutions, real-estate agencies, non-governmental organisations. Ministries of housing

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be every two years until the year 2036.

Data providers

National Focal points will nominated by respective Governments.

Data compilers

UNHABITAT

Reference:

UNHABITAT, July 2009, "**Urban Indicators Guidelines**: *Monitoring the Habitat Agenda and the Millennium Development Goals- Slums Target*", https://unhabitat.org/urban-indicators-guidelines-monitoring-the-habitat-agenda-and-the-millennium-development-goals/, pp 9-10.

32. Gini coefficient at national/city/ urban levels

Definition

Gini Coefficient measures the extent to which the distribution of income (or consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. In a city where all inhabitants have equal income, Gini coefficient is zero. On the other hand, in a city where all the income is earned by only one individual, Gini Coefficient is one.

Rationale

In the NUA Member States committed sustainable urban development that was inclusive. In this regard, they agreed to ending poverty and reducing the growing inequality (NUA §25). The Gini Coefficient is well-known measure of inequality that can be used to monitor whether inequality is declining as desired by Member States.

Methodology

$$Gini = \frac{1}{2m}\frac{1}{n^2}\sum_{i=1}^{n}\sum_{j=1}^{n}|y_i - y_j|$$

Where :

$y_i = Mininmum\ level\ of\ income$

$y_j = Maximum\ level\ of\ income$

$n = Total\ population$

$m = Average\ income$

In practice, statistical software like STATA are used to compute Gini coefficient from household income and expenditure survey data, using STATA commands like *fastgini* and *ineqdec0*.

Coverage:

Compute Gini Coefficient at National, Urban and City level.

Data Sources

At the national level the respondent will be in the Ministry selected by the government as the focal point for this indicator, data can be obtained from the national statistical office.

Gini coefficient data is often available in household income and expenditure survey reports. The World Bank routinely collects or compiles national level Gini Coefficient but not city level data.

Disaggregation:

national, urban, rural and city levels.

Collection process:

At the Global level, send information to UNHABITAT-GUO, unhabitat-guo@un.org.

The monitoring of the indicator can be 2 years until the year 2036.

Data compiler

UNHABITAT

Reference:

UNHABITAT, “MEASUREMENT OF CITY PROSPERITY: Methodology and Metadata”, 2016, pp 107-108, https://unhabitat.org/wp-content/uploads/2019/02/CPI-METADATA.2016.pdf

33 Presence of national legislation forbidding discrimination in housing on the basis of race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status

Definition:

Prohibition of discrimination, whether constitutional or statutory. Is more likely to be a blanket prohibition of all forms of discrimination (whether with respect to housing or employment etc.). Consequently, it will suffice if a country has a law prohibiting all forms of discrimination. If a country has a law prohibiting discrimination in housing, that will be good too.

Rationale:

SDG 11 target 11.1 states that "By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums". In addition, the New Urban Agenda calls for adequate housing for all (NUA §31). It is a measure of how far a country is from achieving adequate housing for all one of the key commitments in the New Urban Agenda (NUA §31). However, this NUA commitment and SDG target can be achieved only if there is no discrimination in housing.

Methodology

Computation Method:

Presence of national legislation forbidding discrimination in housing on the basis of race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.

Yes	
No	

Disaggregation:
Data to be provided at national level.

Data Sources

At the national level the respondent will be in the Ministry selected by the government as the focal point for this indicator. A senior level civil servant would be well placed to provide answers for this indicator.

Collection process:
At the Global level, send information to UNHABITAT-GUO, unhabitat-guo@un.org.
The monitoring of the indicator can be every five years until 2036.

Data providers

National Focal points will nominated by respective Governments.

Data compiler

UNHABITAT

34 Ratio of Length of bicycle lanes to length of roads (excluding motorways).

Definition:

Ratio of length of bicycle lanes to length of roads in a city.

Rationale:

The Netherlands, Denmark and Germany have led in creating good design of bicycle infrastructure and compact building style thus reducing travel distances and encouraging cycling in their cities. The benefits of having a significant proportion of a city's residents cycling instead of utilizing private cars to get around a city include better health due to increased physical activity and reduced air and noise pollution as a result of less vehicular traffic on the streets[71]. Lower vehicular traffic means lower emissions of carbon dioxide (CO2), nitric oxide (NO), nitrogen dioxide (NO_2) and particulates, imply slower global warming.

Methodology

Computation Method:
Obtain map of the city and shapefiles for roads from department of roads or the Ministry of Transport.
Overlay map of the city with the roads layer, if the roads layer specifies which roads have bicycle lanes, select roads that have bicycle lanes and compute their total length, then select all roads and compute their length using GIS software.

If the roads layer does not specify which roads have bicycle lanes, then the carry out GIS-mapping of bicycle lanes as was done in City of Edmonton[72]. It took about 100 man-hours about one week work for two people. Once the one-time-only conversion of lines on maps into GIS data has been completed, in the following years, updating the bike-lane maps takes only a day.

Numerator: total length of bicycle lanes in the city.

Denominator: total length of roads (excluding motorways) lanes in the city.

Disaggregation:
Data to be provided at city level.

Data Sources

The Ministry selected by the government as the focal point for this indicator, data supplied by the cities.

[71] Angela Hull & Craig O'Holleran, "Bicycle infrastructure: can good design encourage cycling?" https://www.tandfonline.com/doi/full/10.1080/21650020.2014.955210
[72] Alex Macdonald, "GIS bike lane mapping saves hundreds of hours", https://transformingedmonton.ca/gis-bike-lane-mapping-saves-hundreds-of-hours/

Collection process:
At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

Annual monitoring of the indicator until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compiler

UNHABITAT

References

Alex Macdonald, “GIS bike lane mapping saves hundreds of hours”, https://transformingedmonton.ca/gis-bike-lane-mapping-saves-hundreds-of-hours/

Angela Hull & Craig O’Holleran, “Bicycle infrastructure: can good design encourage cycling?” https://www.tandfonline.com/doi/full/10.1080/21650020.2014.955210

35 Ratio of Length of sidewalks to length of roads (excluding motorways).

Definition:

Ratio of Length of sidewalks to length of roads (excluding motorways) in a city.

Rationale:

We are all pedestrians at different times of the day. However, the design of streets favours motorized traffic. 2011 – 2020 is the Decade for Action for Road Safety, which offers a framework for making walking safer, less stressful and more pleasant. Greater pedestrian safety will encourage more urban residents to walk.[73] There around 1.24 million traffic annually around the Globe, 22% (270,000) of these are pedestrians. That is a huge loss to affected families and it also represents loss of potential output due to death workers and entrepreneurs.

WHO has stated that Noncommunicable diseases (NCDs), including cardiovascular diseases and diabetes – are the major cause of death worldwide. Around 16 million people who die before the age of 70 from NCDs[74]. Walking is a good exercise is a proven method for reducing the incidence of diabetes and cardiovascular diseases. This results in a more productive population and also lower health cost for both city residents and the government.

Methodology

Computation Method:
Obtain map of the city and shapefiles for roads from department of roads or the Ministry of Transport.
Overlay map of the city with the roads layer, if the roads layer specifies which roads have sidewalks, select roads that have sidewalks and compute their total length, then select all roads and compute their length using GIS software.

If the roads layer does not specify which roads have sidewalks, then the carry out GIS-mapping of sidewalks as was done for bike lanes in City of Edmonton[75]. Once the one-time-only conversion of lines on maps into GIS data has been completed, in the following years, updating the bike-lane maps takes only a day. It will be more cost effective to conduct the GIS-mapping of sidewalks and bike lanes at the sametime.

Numerator: total length of sidewalks in the city[76].

Denominator: total length of roads (excluding motorways) lanes in the city.

Disaggregation:
Data to be provided at city level.

Data Sources

The Ministry selected by the government as the focal point for this indicator, data supplied by the cities.

[73] WHO, “MAKE WALKING SAFE: A brief overview of pedestrian safety around the World”,
[74] WHO, “Campaign for action – meeting the NCD targets”, https://www.who.int/beat-ncds/about/en/
[75] Alex Macdonald, “GIS bike lane mapping saves hundreds of hours", https://transformingedmonton.ca/gis-bike-lane-mapping-saves-hundreds-of-hours/
[76] Length of the portions of the road that have sidewalk on one or both sides of the road.

Collection process:
At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

annual monitoring of the indicator until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compiler

UNHABITAT

References

Alex Macdonald, “GIS bike lane mapping saves hundreds of hours”, https://transformingedmonton.ca/gis-bike-lane-mapping-saves-hundreds-of-hours/

WHO, “MAKE WALKING SAFE: A brief overview of pedestrian safety around the World”,

WHO, “Campaign for action – meeting the NCD targets”, https://www.who.int/beat-ncds/about/en/

36a Mortgage debt relative to GDP
36b Mortgage default rate

Definition:

The collateral of a mortgage loan on a real estate property is generally the real estate property itself. The borrower owns the structure once he/she has paid off the mortgage. The advantage of a mortgage is that it allows the borrower to spread loan repayments over a period of time that is manageable to borrower. There are big variations in levels of mortgage debt to GDP among countries. However, this partly explained by differences in home ownership levels.[77] This indicator has two components:

5a Mortgage debt as percentage of GDP

5b Mortgage default rate.

Rationale:

There are many reasons to monitor mortgage debt. Most households cannot afford to pay for a house or flat without getting a mortgage loan. Hence, the availability of mortgage loans is key to increasing homeownership. Increasing homeownership is one of the major ways to achieving adequate housing for all, one of the key commitments in the New Urban Agenda (NUA §31). Houses and flats provide housing for the household and are also a major asset for households. More mortgage loans are readily available, more households become homeowners. There are also macroeconomic reasons for monitoring mortgage debt, it is important that policies are in place to ensure that borrowers purchase properties that they can afford.

It is also important monitor mortgage default rates. Borrowers who default lose their homes. Hence it is important to formulate policies to deal with the causes of mortgage defaults. Hence, this indicator has a second component: the mortgage default rate.

Concepts:

Mortgage Depth is the outstanding mortgage debt relative to GDP and gauges the depth of mortgage markets by focusing on the total volume[78].

Housing Loan Penetration, the percentage of adult population with an outstanding loan to purchase a home[79].

Mortgage default rate is the number of mortgage defaults in a year divided total number of mortgage loans.

Methodology

(a) Mortgage debt as a percentage of GDP = $100\ [\frac{\text{Mortgage debt}}{\text{GDP}}]$

[77] https://www.economist.com/economic-and-financial-indicators/2007/09/20/mortgage-debt-and-gdp

[78] Anton Badev, Thorsten B., Ligia V., Simon W., "Housing Finance Across Countries New Data and Analysis", Policy Research Working Paper 6756, page 5, http://documents.worldbank.org/curated/en/697351468165251669/pdf/WPS6756.pdf,data sources are listed in Appendix A1 of this World Bank Working paper.

[79] *Ibid,* page 6

(b) Mortgage default rate = 100 $[\frac{\text{number of mortgage loans defaulted in a year}}{\text{total number of Mortgage loans outstanding}}]$

Mortgage debt in national currency
GDP at current prices in national currency

Disaggregation:
Data to be provided at national level and disaggregated between residential buildings and other, if possible.

Data Sources

The Ministry selected by the government as the focal point for this indicator. The most common data source for mortgage debt is a country's central bank. Data from 2016 Housing Finance in Africa Yearbook can be used as baseline data for those countries covered[80].

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be annual until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

1. Anton Badev, Thorsten B., Ligia V., Simon W., "Housing Finance Across Countries New Data and Analysis", Policy Research Working Paper 6756, page 5, http://documents.worldbank.org/curated/en/697351468165251669/pdf/WPS6756.pdf,data sources are listed in Appendix A1 of this World Bank Working paper.
2. Centre for Affordable Housing in Africa, "2016 Housing Finance in Africa Yearbook", http://housingfinanceafrica.org/documents/2016-housing-finance-in-africa-yearbook/
3. The Economist, 20/09/2007, https://www.economist.com/economic-and-financial-indicators/2007/09/20/mortgage-debt-and-gdp

[80] Centre for Affordable Housing in Africa, "2016 Housing Finance in Africa Yearbook", http://housingfinanceafrica.org/documents/2016-housing-finance-in-africa-yearbook/

37: Percentage of people living in unaffordable housing

Definition:

Article 25 of the Universal Declaration of Human Rights states that everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing and housing. Unaffordable housing makes it difficult for a household to have an adequate standard of living, which is a human right.

Rationale:

The New Urban Agenda's vision is guided by the principle of "Leave no one behind" by ending poverty by providing access (among other things) to adequate and affordable housing (NUA §14). In this connection Member States agreed to supporting the implementation of urban planning strategies, that facilitate the provision of affordable housing options with access to quality basic services and public spaces for all, safety and security and intergenerational interaction (NUA §99).

The existing method UN-Habitat's measure for unaffordability is the net monthly expenditure on housing cost that exceeds 30% of the total monthly income of the household UNHABITAT (2017). It is important to also compute and report on "Percentage of people in households that spend 30 percent or more of their income on housing costs" so that the percentage of the urban or city population in living in unaffordable housing is monitored, which may lead to appropriate policies to address the problem being formulated.

Methodology

Computation Method:

The national focal point for this indicator can obtain this data from the national statistical office. A national statistical office can compute percentages of population living in unaffordable housing utilizing household surveys such as Demographic Health Surveys (DHS), MICS and population and housing census data as well as household income and expenditure survey using the following formula:

Percentage of people in households that spend 30 percent or more of their income on housing costs =

$$100\ [\frac{\text{Number of of people living in households that spend 30 percent or more of their income on housing costs}}{\text{City population}}]$$

Disaggregation:

Data to be provided at national and city level.

Data Sources

National Statistical Office

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

Annual monitoring until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

6. New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf
7. United Nations, The Universal Declaration of Human Rights, Article 25, https://www.ohchr.org/EN/UDHR/Documents/UDHR_Translations/eng.pdf
8. UN-HABITAT, 2017, "Measuring the SDG Target 11.1's Indicator – Background concept note", page 8
9. UN-HABITAT, 2016, "The Fundamentals of Urbanization Evidence Base for Policy Making", https://unhabitat.org/wpdm-package/the-fundamentals-of-urbanization-evidence-base-for-policy-making/, pages 61-62

38: Percentage of cities with slum upgrading programmes

Definition:

Slums housing does not have at least one of the following[81]:

- Access to improved water;
- Access to improved sanitation;
- Sufficient living area (not overcrowded),
- Durable dwelling; and
- Security of tenure.

Rationale:

The percentage of slum dwellers in developing countries has declined from 39.4% in 2000 to 29.7% in 2014 but it has increased in absolute numbers from 791 million to 881 million over the same period[82]. Two major causes of slums are lack of improved water and improved sanitation, thus as economies develop, cities are able provide basic services such as piped water and improved sanitation and the proportion on slum dwellers declines. The well-being of slum dwellers is lower than that of well-off urban dwellers. The children of slum dwellers tend not to have access to good health care or schools. Hence, it important for local governments to formulate policies to upgrade slums.

Methodology

Computation Method:

This indicator has two components that should be computed or counted:

(a) Percentage of cities with slum upgrading programmes =

$$100\ [\frac{\text{Number of cities with slum upgrading programmes}}{\text{Total number of cities}}]$$

(b) Number of cities having an annual budget allocation addressing any of the five slum depravations: this is a count.

Disaggregation:
Data to be provided at national and city level.

Data Sources

The Ministry selected by the government as the focal point for this indicator. Some data can come from the cities directly.

Collection process:

[81] These five criteria are defined in the metadata for indicator 11.1.1 in this Framework.
[82] UNHABITAT, "World Cities Report 2016", page 3

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

Bi-annual monitoring until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

UNHABITAT, “World Cities Report 2016”, page 3

39 Percentage of cities that have integrated housing policies and regulations in their local development plans

Definition:

Percentage of cities that have a local plan which incorporate as relevant policies and regulations for development of adequate housing[83].

Rationale:

This is to understand the role of housing within National Urban Policies and plans, whether is treated as a central element (as per the Housing@centre approach[84]) or if it not included. Cities can integrate housing policies in their strategic plans such as provision of adequate and affordable housing for all including subsidized housing to low income families[85] in line with the principle of "no one left behind". Other housing policies could include sustainable building codes, regulations or certification tools for sustainable housing construction in line with SDG 11.1.

Methodology

Computation Method:

Has the city integrated housing policies and regulations in their local development plans?

Yes	
No	

Percentage of cities that have integrated housing policies and regulations in their strategic plans =

$$100\ [\frac{\text{number of cities that have integrated housing policies and regulations in their local development plans}}{\text{total number of cities}}]$$

The ministry responsible for municipalities of housing can examine local development plans for every city and determine whether how many of them have integrated housing policies and regulations in them. The it should compute the percentage of cities that have integrated housing policies and regulations in their local development plans.

Disaggregation:
National indicator based on city level data.

Data Sources

[83] Adequate housing is defined in Indicator 13 (SDG-11.1.1) which is included in this document.
[84] https://unhabitat.org/housing-at-the-centre-of-the-new-urban-agenda/
[85] UN-Habitat Strategic Plan 2020-2023: Results Framework

City strategic plans.

Collection process:
At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

Annual monitoring until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compiler

UNHABITAT

References

1. UN-Habitat Strategic Plan 2020-2023: Results Framework
2. https://unhabitat.org/housing-at-the-centre-of-the-new-urban-agenda/

40 Total investment in housing (in both formal and informal sectors in the urban area), as a percentage of gross city product.

Definition:

This indicator measures total investment in housing (in both formal and informal sectors in the urban area) in local currency.

Rationale:

Reaching the commitments of the New Urban Agenda requires substantial improvement is the living standards of slum dwellers. Similarly, achieving sustainable Target 11.1, which is to ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums, requires mobilizing financial resources for both slum upgrading and prevention and supplying new affordable housing to low income households[86]. According to the "World Urbanization Prospects 2018", the World urban population will rise from 4,379 million in 2020 to 5,556 million in 2035[87]. All this increase in population will require housing, in addition, the population that is currently living in slums (estimated at 1.76 billion in 2014) will also require their housing to be either upgraded or be moved to new adequate housing. Hence, it is very important to monitor the level of investment in residential buildings.

Concepts:

Residential housing is defined as "Dwellings" in the System of National Accounts 2008[88]:

Buildings entirely or primarily used as residences, including associated structures, such as garages and permanent fixtures customarily installed in residences. Houseboats, barges, mobile homes and caravans used as principal residences of households are also included, as are public monuments identified primarily as dwellings. Examples include residential buildings for communities such as retirement homes, hostels and orphanages.

Costs of preparing a site for construction of a dwelling are considered part of costs of the new dwelling.
Incomplete dwellings are included to the extent that the ultimate user is deemed to have taken ownership, either because the construction is on own account or as evidenced by existence of a contract of sale or purchase.

Dwellings acquired for military personnel are included because they are used for the production of housing services, in the same way as dwellings acquired by civilian units.

"Net capital formation of dwellings" is "gross capital formation of dwellings" minus "depreciation of dwellings", as elaborated on Table 10.2 in the System of National Accounts 2008.

Methodology

Request estimates of "Net capital formation of dwellings" and "gross capital formation of dwellings" from the National Accounts Section of the national statistical offices

[86] UNHABITAT, Global Report on Human Settlements 2005: Financing Urban Shelter, page v. The point made there is still valid.
[87] United Nations DESA / Population Division, "World Urbanization Prospects 2018", https://population.un.org/wup/Download/
[88] United Nations et al, 2009, "System of National Accounts 2008", ISBN 978-92-1-161522-7, pages 202 – 203, https://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf

Disaggregation:

Data to be provided at national level.
Countries with advanced statistical systems can provide data at city level as well.

Data Sources

The Ministry selected by the government as the focal point for this indicator to obtain data on this indicator from the national statistical office.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

Annual monitoring of the indicator until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compiler

UNHABITAT

References

1. UNHABITAT, Global Report on Human Settlements 2005: Financing Urban Shelter, pages v & 5.
2. United Nations DESA / Population Division, "World Urbanization Prospects 2018", https://population.un.org/wup/Download/
3. United Nations et al, 2009, "System of National Accounts 2008", ISBN 978-92-1-161522-7, pages 202 – 203, https://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf

41 Percentage of government budget dedicated to housing subsidies

Definition:

"Percentage of government budget dedicated to housing subsidies" is total value of government subsidies expressed as a percentage of total government expenditures.

Rationale:

All urban residents need adequate and affordable housing for them to enjoy a good standard of living and have economic security. However, affordable housing may not be available in private real estate market. Hence, governments may need to subsidize housing for low income residents. Subsidized housing is cheaper to rent than privately rented housing and usually provides a long-term tenancy[89]. The indicator will determine if governments are spending enough and effectively on social housing.

Some of the benefits of subsidized housing are social inclusion, education and employment, however such benefits are not easy to measure using standard cost benefit analysis. The Australian Housing and Urban Research Institute recommends use of public health evaluation methodologies such as the housing-adjusted life years approach, to appraise subsidized housing.

Methodology

Data on total government expenditure and government housing subsidies will be available in government finance statistics or from ministries of finance and ministries of housing.

Computation Method:

"Proportion government budget dedicated to housing subsidies" is total value of government subsidies expressed as a percentage of total government outlays.

$$Percentage\ of\ government\ budget\ dedicated\ to\ housing\ subsidies = 100\ X\ [\frac{\text{Total value of government housing subsidies}}{\text{Total government expenditure}}]$$

Disaggregation:
Data to be provided at national level

Data Sources

The Ministry selected by the government as the focal point for this indicator. Some data can come from the cities directly.

[89] https://england.shelter.org.uk/support_us/campaigns/what_is_social_housing

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

Annual monitoring until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

1. Australian Housing and Urban Research Institute, June 2019, "Social housing as infrastructure: rationale, prioritisation and investment pathway", , https://www.ahuri.edu.au/__data/assets/pdf_file/0014/43214/AHURI-Final-Report-315-Social-housing-as-infrastructure-rationale-prioritisation-and-investment-pathway.pdf

2. Shelter England, "What is social housing?", https://england.shelter.org.uk/support_us/campaigns/what_is_social_housing

42 Percentage of commuters using public transport.

Definition:

Percentage of commuters aged 15 years and over who used public transport as their main means to travel to work during a reference period (e.g. on Census day, survey date etc.). Main mode of travel is defined as the transport mode used to travel the longest distance to their place of employment.[90]

Rationale:

The advantages of commuters using public transport are increased physical activity and greater safety than travelling by private vehicle. The greater the percentage of commuters that use public transport, the fewer the number of private vehicles on the streets and the lower the risk of road traffic crashes, and the lower the long-term exposure to air pollutants for pedestrians and cyclists sharing the streets hence the higher the life expectancy.

Methodology

Computation Method:
Numerator: Number of commuters who use public transport as their main means of travel (i.e. to travel the longest distance) to get to their place of employment.
Denominator: Total number of commuters. Commuters are defined as the employed usually resident population aged 15 years and over who travelled to work during reference period.

Disaggregation:
Data to be provided at national urban and city level.

Data Sources

The Ministry selected by the government as the focal point for this indicator. The main source of data is normally the national statistical office, but some cities may provide data.

Collection process:
At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The indicator can be monitored annually until the year 2036.

Data compilers

UNHABITAT

References

http://www.ehinz.ac.nz/assets/Factsheets/Metadata/Metadata-main-means-of-travel-to-work.pdf

https://www.bma.org.uk/collective-voice/policy-and-research/public-and-population-health/transport

[90] http://www.ehinz.ac.nz/assets/Factsheets/Metadata/Metadata-main-means-of-travel-to-work.pdf adapted from that factsheet

43 Small- and medium-sized enterprises percentage share of GDP

Definition:

The indicator measures the share small- and medium-sized enterprises percentage share of GDP. Small and medium-sized enterprises (SMEs) are enterprises employing fewer than 250 people[91].

Rationale:

One of the key commitments of Member States in the New Urban Agenda is sustainable and inclusive urban prosperity and opportunities for all. One way of creating opportunities for all is through supporting small- and medium-sized enterprises. This indicator is for monitoring SMEs' share of GDP. SMEs generate a lot of employment opportunities to men, women and youth. The bigger their share of GDP, in general, the greater the employment opportunities.

Disaggregation:

Data to be provided at national level.

Data Sources

The government agency responsible for compiling national accounts (GDP figures) usually the national statistical office.

Collection process:
At the Global level, send information to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be every two years until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compiler

UNHABITAT

References

OECD definition of SMEs is at https://data.oecd.org/entrepreneur/enterprises-by-business-size.htm

The New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf

[91] OECD definition of SMEs is at https://data.oecd.org/entrepreneur/enterprises-by-business-size.htm

44 Employment in cultural and creative industries of as proportion of total employment

Definition:

The indicator is represented by the share of cultural and creative industries employment in total employment.

Rationale:

This indicator measures the percentage of cultural and creative industries employment in total employment. Cultural and creative industries can absorb significant proportion of workers in a country. It is important for central and local governments to come up with policies to encourage this sector. In this regard, governments require data on this indicator for planning purposes.

Concept:

Persons in employment are defined as all those of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit. They comprise employed persons "at work", i.e. who worked in a job for at least one hour; and employed persons "not at work" due to temporary absence from a job, or to working-time arrangements (such as shift work, flexitime and compensatory leave for overtime)[92].

Methodology

Computation Method:

$$\frac{\text{Total employment in cultural and creative activities}}{\text{Total employment in all economic activities}} * 100$$

Disaggregation:

-Disaggregation by sex.
-Disaggregation by city/urban level.

Data Sources

labour force surveys, population censuses etc. The ministry that is the focal point to obtain data from the national statistical office

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

[92] ILO Glossary of Statistical Terms, https://www.ilo.org/ilostat-files/Documents/Statistical%20Glossary.pdf

Calendar

The monitoring of the indicator every two year until 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

ILO Glossary of Statistical Terms, https://www.ilo.org/ilostat-files/Documents/Statistical%20Glossary.pdf

45 Annual number of vocational and technical education individuals trained

Definition:

This indicator measures the number of people that have completed their vocational and technical training during the year.

Rationale:

A thriving modern urban economy requires an adequate supply of technical and entrepreneurial skills. However, many countries have focused on producing university graduates. Consequently, not enough young people are getting vocational training. In U. K., for example, only one third of jobs created between 2012 and 2022 were expected to be in jobs in high-skilled occupations. During the same period, around twenty percent of workers in lower skilled occupations have higher education qualifications[93]. They are over-qualified for their jobs. It was projected that there would be an additional 3.6 million jobs in medium-skilled occupations by 2022.

Benefits of vocational education and training (VET) depends on the demand for those skills in a country. Analysis of Survey of Education and Training (longitudinal) Australial shows that individuals with VET qualifications on average receive higher wages throughout their career than similar individuals without VET qualifications[94].

In many developing countries, some of the workers trained at vocational colleges go into paid employment and some the workers become productive self-employed entrepreneurs since many economies cannot produce enough formal sector jobs.

Concepts:

There are five types of vocational systems[95]:

1. Vocational and technical schools;
2. Vocational training centres;
3. Formal apprenticeships;
4. Dual apprenticeships combining school training with a firm-based approach; and
5. Informal-based training

Countries select preferred system based on their institutional framework conditions and traditions.

Methodology

Computation Method:

Get the total number of individuals who have completed vocational and technical education training during each year.

[93] IPPR, "Winning the global race? Jobs, skills and the importance of vocational education", http://www.ippr.org/files/publications/pdf/winning-global-race_June2014.pdf

[94] OECD, "Costs and Benefits in Vocational Education and Training", https://www.oecd.org/education/innovation-education/41538706.pdf , page 14

[95] UNESCO, 2014, "Attractiveness of vocational education and training", https://unevoc.unesco.org/fileadmin/up/bibb_unevoc_bibliography.pdf

Disaggregation:

Data to be provided at national level.

Data Sources

The Ministry selected by the government as the focal point for this indicator to obtain data from governments ministries that run or regulate vocational training institutions.

Collection process:
At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator to be annual until 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

1. IPPR, "Winning the global race? Jobs, skills and the importance of vocational education", http://www.ippr.org/files/publications/pdf/winning-global-race_June2014.pdf
2. OECD, "Costs and Benefits in Vocational Education and Training", https://www.oecd.org/education/innovation-education/41538706.pdf , page 14
3. UNESCO, 2014, "Attractiveness of vocational education and training", https://unevoc.unesco.org/fileadmin/up/bibb_unevoc_bibliography.pdf

46 Percentage of land under protected natural areas

Definition:

This indicator measures land under protected natural areas as a proportion of area of a city.

Rationale:

Establishing and managing protected areas is part of the economic development and planning process, it ensures that sustainable development takes into account national cultural heritage and conservation policies. The protected areas have to be classified in a way that ensures the efficient functioning of a national system of protected areas[96]. Parks and vegetation increase value of properties around them.

Concepts:

Protected areas[97], as defined by the International Union for Conservation of Nature (IUCN; Dudley 2008), are clearly defined geographical spaces, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. Importantly, a variety of specific management objectives are recognised within this definition, spanning conservation, restoration, and sustainable use:

- Category Ia: Strict nature reserve
- Category Ib: Wilderness area
- Category II: National park
- Category III: Natural monument or feature
- Category IV: Habitat/species management area
- Category V: Protected landscape/seascape
- Category VI: Protected area with sustainable use of natural resources

The status "designated" is attributed to a protected area when the corresponding authority, according to national legislation or common practice (e.g., by means of an executive decree or the like), officially endorses a document of designation. The designation must be made for the purpose of biodiversity conservation, not de facto protection arising because of some other activity (e.g., military).

Methodology

Computation Method:

Measure the areas occupied by each of seven categories of protected areas. Express each as well as the total protected area as a percentage of area occupied by the city.

[96] UNEP, "COMMON GUIDELINES AND CRITERIA FOR PROTECTED AREAS IN THE WIDER CARIBBEAN REGION: Identification, Selection, Establishment and Management", CEP Technical Report: 37, 1996

[97] https://unstats.un.org/sdgs/metadata/files/Metadata-14-05-01.pdf

Disaggregation:
Data to be provided at city level.

Data Sources

The Ministry selected by the government as the focal point for this indicator to obtain the data from the cities.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The indicator to be monitored twice a year until 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

1. UNEP, "COMMON GUIDELINES AND CRITERIA FOR PROTECTED AREAS IN THE WIDER CARIBBEAN REGION: Identification, Selection, Establishment and Management", CEP Technical Report: 37, 1996

2. https://unstats.un.org/sdgs/metadata/files/Metadata-14-05-01.pdf

47 Percentage of local governments that adopt and implement local disaster risk reduction strategies in line with national strategies.

Definition:

This indicator measures the percentage of local governments that adopt and implement local disaster risk reduction strategies in line with national strategies[98].

Rationale:

The Sendai Framework for Disaster Risk Reduction 2015 – 2030 place a great deal of emphasis strengthen resilience by anticipating and planning for disaster risk to better protect people, their livelihoods, their socioeconomic assets and ecosystems. Planning for disasters requires better coordination better all levels of government (central, subnational and cities), responsibilities must be assigned in advance for all public and private stakeholders. The Framework recommends that local authorities, cities and local communities be empowered by the central government and given appropriate decision-making responsibilities, resources and incentives[99].

Methodology

Computation Method:

$$\%\ of\ local\ governments\ that\ adopt\ and\ implement\ local\ disaster\ risk\ reduction\ strategies\ in\ line\ with\ national\ strategies.$$
$$= 100\ X\ [\frac{\text{local governments that have adopted and implemented local disaster risk reduction strategies in line with national strategies}}{\text{Total number of local governments}}]$$

Disaggregation:
Data to be provided at by local authorities.

Data Sources

The Ministry selected by the government as the focal point for this indicator to count the number of local authorities that have adopted and implemented local disaster risk reduction strategies.

Collection process:
At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator every two years until 2036.

Data providers

National Focal points will be nominated by respective Governments.

[98] This indicator is different from SDG-11.b.1, which is "Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030."

[99] Sendai Framework for Disaster Risk Reduction 2015 – 2030, page 13, https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf

Data compilers

UNHABITAT

Reference

Sendai Framework for Disaster Risk Reduction 2015 – 2030, page 13, https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf

48 Percentage national/subnational/local government budgets dedicated to climate change mitigation and adaptation actions

Definition:

This indicator seeks to determine the proportion of national/subnational/local government budgets dedicated to climate change mitigation and adaptation actions

Rationale:

The indicator will lead to increasing the number of national/subnational/local governments that adopt and implement national and local disaster risk reduction strategies in line with the Sendai Framework and will contribute to sustainable development by mitigating the effects of climate change[100].

Methodology

Computation Method:

$$\%\ of\ national, sub-national\ governments\ and\ cities\ with\ dedicated\ budgets\ for\ climate\ change\ mitigation\ and\ adaptation\ actions = 100\ X\ [\frac{\text{cities, national and sub} - \text{national governments and with dedicated budgets for climate change mitigation and adaptation actions}}{\text{Total number of cities, national and sub} - \text{national governments}}]$$

Disaggregation:

Data to be provided at national, subnational and city level.

Data Sources

The Ministry selected by the government as the focal point for this indicator will check how many city, subnational and national budgets are dedicated to climate change mitigation and adaptation actions, then compute the percentage that have dedicated budgets.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The indicator to be monitored every two years until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

https://unstats.un.org/sdgs/metadata/

[100] This indicator is related to "Indicator 11.b.1: Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030". However, note that this indicator specifically asks about a dedicated budget at the different levels of government. The existence of a budget will ensure that disaster risk reduction strategies are implemented at the different levels of government.

49 Percentage of cities with multi-hazard mapping

Definition:

The indicator seeks to determine the proportion of cities that have multi-hazard maps in a country.

Rationale:

The Sendai Framework for Disaster Risk Reduction 2015-2030 is a worldwide agreement to prevent disaster risks and reduce their negative impact. Its objective is to improve social and economic resilience and to reduce the adverse effects of climate change and man-made hazards. Over the past two decades, the frequency and intensity of natural hazards (like hurricanes/cyclones) have increased a lot. These disasters cause many deaths and loss of livelihoods, destroy infrastructure and the environment. Disasters wipe out economic progress and perpetuates poverty. Hence, reducing cities' vulnerability to hazards reduces the risk of economic progress being wiped out and poverty increasing. Multi-hazard maps can be used to zone areas in such a way that, for example, no residential and commercial building built in areas that can flood.

Methodology

Computation Method:

Does your city have multi-hazard maps?

Yes	
No	

If yes, have these multi-hazard maps been updated in the past five years?

Yes	
No	

Disaggregation:

Data to be collected at city level then aggregated at the national level.

Data Sources

The Ministry selected by the government as the focal point will collect and aggregate the information.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator will be every two years until the year 2036.

Data compilers

UNHABITAT

References

The New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf
Sendai Framework for Disaster Risk Reduction 2015-2030, https://www.unisdr.org/we/coordinate/sendai-framework

50 Does the country have a multi-hazard monitoring and forecasting system?

Definition:

This is an indicator of whether or not a country has a multi-hazard monitoring and forecasting system.

Rationale:

In the New Urban Agenda, Member States committed themselves to strengthening the resilience of cities and human settlements, with ecosystem-based approaches and by mainstreaming holistic and data-informed disaster risk reduction and management at all levels to reduce vulnerabilities and risk in line with the Sendai Framework for Disaster Risk Reduction 2015-2030 (NUA §77).

Methodology

Computation Method:

Does the country have a multi-hazard monitoring and forecasting system?

Yes	
No	

If yes, has it been updated in the past five years?

Yes	
No	

Disaggregation:

Data to be provided at national level??

Data Sources

The Ministry selected by the government as the focal point for this indicator

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator is every two years until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

The New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf

51 Substantially increase the availability of and access to multi hazard early warning systems and disaster risk information and assessments to the people by 2036: Number of cities that have / percentage of urban population that is covered by multi-hazard early warning systems

Definition:

This indicator will monitor changes it the availability of and access to multi hazard early warning systems and disaster risk information and assessments to the people by 2036. Specifically, the number of cities that have / percentage of urban population that is covered by multi-hazard early warning systems.

Rationale:

Member States envisaged cities that adopted and implemented disaster risk reduction and management, reduced vulnerability, built resilience and responsiveness to natural and human-made hazards and fostered mitigation of and adaptation to climate change (NUA page 7). One way to reduce the impact of natural and man-made disasters is to substantially increase the availability and access to multi-hazard early warning systems and disaster risk information and assessment to people.

Methodology

Computation Method:

What is the number of cities that have multi-hazard early warning systems?
What is the percentage of urban population that is covered by multi-hazard early warning systems?

Disaggregation:
Data to be provided at national and city level.

Data Sources

The Ministry selected by the government as the focal point for this indicator will aggregate data on cities.

Collection process:
At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator every two years until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

The New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf

52 Number of city staff accredited to the city climate planner training program

Definition:

The City Climate Planner program provides training on how to prepare comprehensive climate action plans or green growth strategies based on reliable data. City climate planning professionals that are trained through this program obtain professional certification.

Urban professionals trained through the City Climate Planner program, have the skills to support local climate action planning, including greenhouse gas emission inventories, climate action and low emission development planning and climate adaptation planning, which are crucial to planning that takes into account climate change.

This indicator monitors the number of city staff accredited to the city climate planner training program. Counting the accredited urban planners is crucial to encouraging cities to have staff that can prepare city-scale sustainable development plans and climate action by linking inventory findings to broader local and national climate goals.

Rationale:

Local governments can use urban and territorial planning to protect and manage the environment in cities, strengthen environmental and socioeconomic resilience, enhance mitigation of and adaptation to climate change[101]. Urban planners certified through the City Planner Program have the capacity to prepare low emission development pathway that curb climate change that reduces environmentally harmful pollutants and greenhouse gas emissions from heating, cooling, lighting and cooking, sustainable of production and consumption with proper waste disposable and recycling and equitable development.

In the New Urban Agenda, Member States cities with urban forms that facilitates cost and resource efficiencies, resilience, environmental protection and sustainable growth. They also committed themselves to promoting sustainable and inclusive industrial development and sustainable consumption and production patterns (NUA §44 & §45). They also advocated for city-level assessments of climate vulnerability and impact to inform adaptation plans, policies, programmes and actions that build the resilience of cities (NUA §80). Hence, the City Planner Program is in line with the New urban Agenda.

Methodology

Computation Method:

A count.

Disaggregation:

Data to be provided at national and city level

[101] UNHABITAT, 2015, 'Guidelines on Urban and Territorial Planning', page 20, HS/059/15E, https://unhabitat.org/books/international-guidelines-on-urban-and-territorial-planning/

Data Sources

The Ministry selected by the government as the focal point for this indicator. The focal point in the Ministry to the information for each city in the country.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be annual until the year 2036.

Data providers

National Focal points will nominated by respective Governments.

Data compiler

UNHABITAT

References:

ICLEI – Local Governments for Sustainability, 'City Climate Planner program', https://iclei.org/en/City_Climate_Planner.html,

UNHABITAT, 2015, 'Guidelines on Urban and Territorial Planning', page 20, HS/059/15E, https://unhabitat.org/books/international-guidelines-on-urban-and-territorial-planning/

53 Existence of an enforced coastal and/or land management plan

Definition:

The indicator seeks to determine the existence of an enforced coastal and/or land management plan in the country.

Rationale:

Many cities across the globe are located in coastal areas, delta regions and islands, these cities are particularly vulnerable to the adverse impacts of climate change such as hurricanes/cyclone, flooding, subsidence and sea level rise (NUA §64). It is very important for such countries to have an enforced coastal and/or land management plans. Such plans can mitigate the impacts of these hazards.

Methodology

Computation Method:

Is there an enforced coastal and/or land management plan in the country?

Yes	
No	

If yes, has it been updated in the past five years?

Yes	
No	

Disaggregation:

Data to be provided at national level.

Data Sources

The Ministry selected by the government as the focal point for this indicator.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator is every two years until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

The New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf

54 Percentage reduction in annual final energy consumption in homes using smart monitoring systems.

Definition:

Percentage reduction in annual final energy consumption in homes using smart monitoring systems.

Rationale:

194 countries adopted the Paris Agreement on Climate Change in 2015[102]. Developed country Parties agreed to take the lead to undertake economy-wide absolute greenhouse gas emission reduction targets. Developing country Parties would continue improving their mitigation efforts and were encouraged to move over time towards economy-wide emission reduction targets taking into account their national circumstances. Many countries are encouraging their citizens to install Home energy management systems which allow the owners to switch on and off household equipment remotely so that they can consume energy more efficiently.

Methodology

The energy supply companies to conduct surveys annually to find out the percentage of residential customers that have installed smart energy management systems and find out energy savings in comparison with before the smart energy management systems were installed.

Computation Method:

$$\%\ reduction\ in\ annual\ final\ energy\ consumption\ in\ homes\ using\ smart\ monitoring\ systems.$$

$$= 100\ [\frac{\text{estimated reduction in energy consumption homes that have installed smart monitoring systems}}{\text{Total energy conspumtion in homes prior to installation of smart moinitotring sytems}}]$$

Disaggregation:

Data to be provided at national and city level

Data Sources

Electricity supply companies and the Ministry selected by the government as the focal point for this indicator.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

Annual monitoring of the indicator until the year 2036.

[102] Paris Agreement, https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

Data providers

National Focal point will be nominated by respective Governments.

Data compilers

UNHABITAT

References

Paris Agreement, https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

55 Decreased delay by traffic congestion on streets with traffic lights connected to traffic management systems

Definition:

Traffic congestion is a major cause of pollution in many big cities in the world. It leads to less economic output, less time for leisure and exercise as well as higher prevalence of respiratory diseases, hence lower quality of life of urban dwellers. In the New Urban Agenda, Member States advocated adoption of a smart-city approach that leverages digitization, clean energy and technologies as one of the solutions to traffic congestion. This indicator measures reduction in duration of typical trips due to introduction of traffic lights connected to traffic management systems.

Rationale:

One strategy for managing the spatial growth of cities is for national, subnational and local governments to develop and adopt technology-based innovations in transport and transit systems to reduce congestion and pollution while improving efficiency, connectivity, accessibility, health and quality of life (NUA §118). Large cities install traffic lights that are connected to traffic management systems as a solution for reducing traffic congestion.

There are three major sources of traffic congestion:

1. Bad weather and road repairs;
2. Traffic demand (peak periods congestion);
3. Transportation infrastructure bottlenecks.

In USA transportation bottlenecks account for 40% of overall traffic congestion.

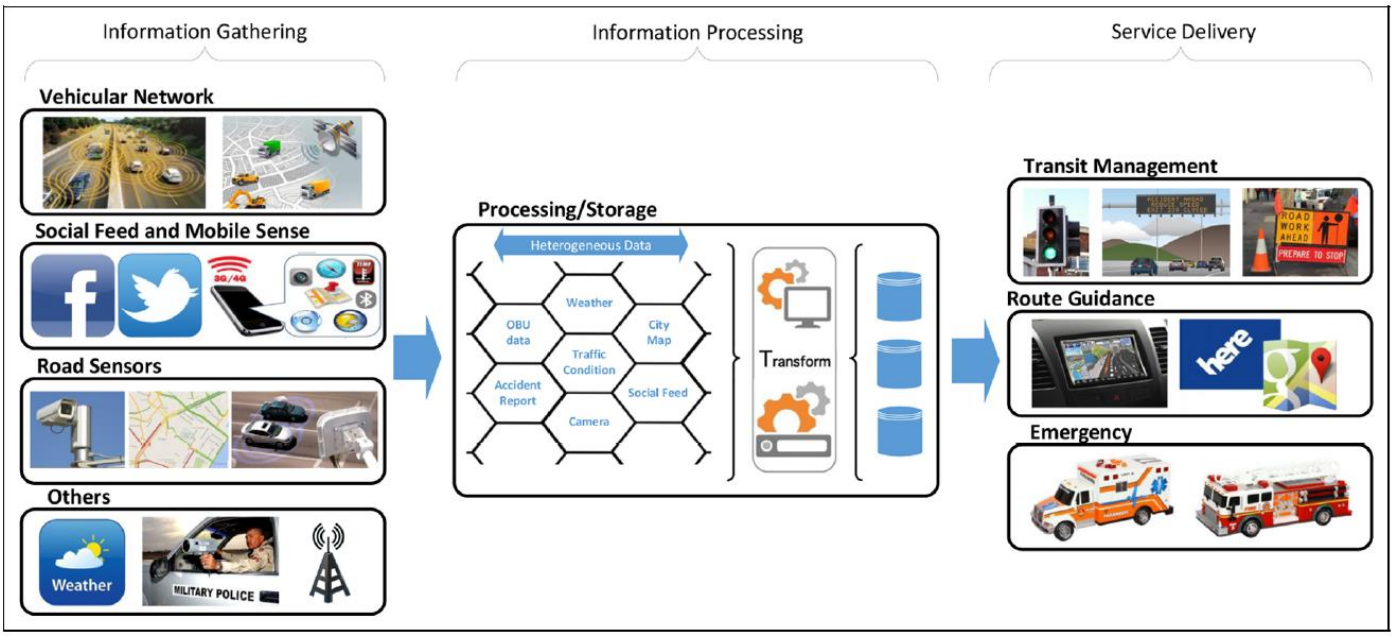

Figure 1: Traffic Management Phases: information gathering, information processing and service delivery[103]

[103] The figure taken from Allan M de Souza, Celso ARL Brennand, Roberto S Yokoyama, "Traffic management systems: A classification, review, challenges, and future perspectives", International Journal of Distributed Sensor Networks, page 4, https://journals.sagepub.com/doi/full/10.1177/1550147716683612

Concepts:

Travel Time Index (TTI): time penalty for a trip on an average day. A TTI of 1.30 indicates a 20-minute free-flow trip takes 26 minutes (20 × 1.30) in the rush hours[104].

Hours of congestion: Hours of congestion—amount of time when freeways operate less than 90 percent of free-flow freeway speeds.

Planning Time Index (PTI): time penalty for a trip to be on time for 95 percent of trips (i.e., late for work on one day per month). A PTI of 1.60 indicates a 20-minute free-flow trip takes more than 32 minutes (20 × 1.60) one day per month.

Methodology

Computation Method:

Compare the Travel Time Index in a city before and after installation of a traffic management system.

Disaggregation:

Data to be provided at city level.

Data Sources

The Ministry selected by the government as the focal point for this indicator.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitor of the indicator every two years until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

[104] The three congestion measure definitions are from the U. S. Department of Transportation, "**2016 Urban Congestion Trends**: Using Technology to Measure, Manage, and Improve Operations", page 2, https://ops.fhwa.dot.gov/publications/fhwahop17010/fhwahop17010.pdf

U. S. Department of Transportation, “**2016 Urban Congestion Trends**: Using Technology to Measure, Manage, and Improve Operations", page 2, https://ops.fhwa.dot.gov/publications/fhwahop17010/fhwahop17010.pdf

Allan M de Souza, Celso ARL Brennand, Roberto S Yokoyama, “Traffic management systems: A classification, review, challenges, and future perspectives”, International Journal of Distributed Sensor Networks, page 4, https://journals.sagepub.com/doi/full/10.1177/1550147716683612

56 Is supervision of local authorities exercised in accordance with such procedures and in such cases as provided for by the constitution or by law?

Definition:

The indicator monitors whether local authorities are run with adherence to laws.

Rationale:

Adherence to rule of rule of law in management of local authorities is a prerequisite for efficient management practices.

Methodology

Computation Method:
Is supervision of local authorities exercised in accordance with such procedures and in such cases as provided for by the constitution or by law?

Yes	
No	

Disaggregation:

Data to be provided at national and city level.

Data Sources

At the national level the respondent will be in the Ministry selected by the government as the focal point for this indicator.
A senior level civil servant would be well placed to provide answers for this indicator.
At the city level, a director of a department in the city council can be the provide the information.

Collection process:

At the Global level, send information to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be every five years until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

57 Percentage of the total budget that the local / sub-national government have discretion over to decide on priorities (financial autonomy)

Definition:

Financial decentralization can serve as an effective policy tool for improving the quality and provision of public services, government accountability, and the efficient use of local financial resources. However, in order to achieve successful financial decentralization, central and local governments must be strategic in how they decentralize financial responsibilities to local governments both in terms of revenue generation and expenditures. Moreover, the decentralization of financial authority to subnational governments must consider both the local capacity of municipal governments and the legal and regulatory framework in which they will assume these responsibilities. Delegating local expenditure and revenue generation responsibilities to municipal governments connects the consumers of public goods and services directly with local government officials who determine how public funds are allocated and what tax policies are implemented. If strong institutions, good governance and a supportive legal and regulatory framework are in place, fiscal decentralization can support and enhance municipal finance. (UN-Habitat, 2017).

Rationale:

In the New Urban Agenda (NUA), Member States committed themselves to: support subnational and local governments in their efforts to implement transparent and accountable expenditure control instruments for assessing the necessity and impact of local investment and projects, based on legislative control and public participation, as appropriate, in support of open and fair tendering processes, procurement mechanisms and reliable budget execution, as well as preventive anti-corruption measures to promote integrity, accountability, effective management and access to public property and land, in line with national policies (NUA 138).

Concepts:
A sub-national government, being closer to the people, is, in theory, more capable compared to central governments to meet citizen's preferences and demands in public goods and services. Research generally supports that fiscal decentralization has been linked to a variety of outcomes (World Bank, 2008). Among those are:

- Economic growth
- Government size
- Changes in public expenditure patterns
- Fiscal imbalances
- Governance and
- Service delivery

Financial responsibility is a core component of decentralization. If local governments and private organizations are to carry out decentralized functions effectively, they must have an adequate level of revenues –either raised locally or transferred from the central government– as well as the authority to make decisions about expenditures (World Bank, 2001).

Methodology

Computation Method:

$$\%\ of\ total\ budget\ that\ the\ local\ governments\ have\ discretion\ over\ to\ decide\ on\ priorities$$

$$= 100\ [\frac{\text{Total budget that the local governments have discretion over to decide on priorities}}{\text{Total local government finances}}]$$

Total local finances = Own source revenue + central government transfers to the local authority + grants and loans from donors, banks etc. + other sources of financial resources

Disaggregation:

Data to be provided at city level and other sub-national levels as appropriate.

Data Sources

Municipal authorities, metropolitan authorities, county governments, district governments.
At the national level, all this data from local governments will be aggregated by national focal point nominated by respective governments.

Calendar

The monitoring of the indicator can be annual until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compiler

UNHABITAT

References

UN-Habitat, 2017, https://unhabitat.org/books/finance-for-city-leaders-handbook-2nd-edition/
World Bank, 2008, Fiscal Decentralization, http://web.worldbank.org/archive/website01061/WEB/0__CO-11.HTM
World Bank, 2001, Intergovernmental Fiscal Relations,
http://www1.worldbank.org/publicsector/decentralization/fiscal.htm

58 Percentage of local/sub-national government's financial resources generated from endogenous (internal) sources of revenue

Definition:

Local authorities in all parts of the world play an increasingly important role in the delivery of fundamental basic public services. But they also face huge challenges. The fundamental problem confronting most local authorities, especially those managing cities in developing countries, is the widening gap between the availability of financial resources and municipal expenditure needs. Most cities in developing countries depend largely on central government transfers and to a lesser extent on revenues derived from own sources. Own sources of revenue include property taxes, charges and fees, betterment levies, vehicle and transportation taxes, local business taxes, excise and sales taxes, income taxes, and natural resource taxes (UN-Habitat, 2014, 2017).

Rationale:

In the New Urban Agenda (NUA), Member States committed themselves to:

Mobilize endogenous resources and revenues generated through the capture of benefits of urbanization, as well as the catalysing effects and maximized impact of public and private investments in order to improve the financial conditions for urban development and open access to additional sources recognizing that, for all countries, public policies and the mobilization and effective use of domestic resources, underscored by the principle of national ownership, are central to our common pursuit of sustainable urban development, including implementation of the New Urban Agenda (NUA §132).

Support appropriate policies and capacities that enable sub-national and local governments to register and expand their potential revenue base, such as through multi-purpose cadastres, local taxes, fees, and service charges, in line with national policies, while ensuring that women and girls, children and youth, older persons, persons with disabilities, indigenous peoples and local communities, and poor households are not disproportionately affected (NUA §134).

Promote capacity development programmes on the use of legal land-based revenue and financing tools as well as on real estate market functioning for policymakers and local public officials focusing on the legal and economic foundations of value capture, including quantification, capturing, and distribution of land value increments (NUA §152).

Concepts:

For a viable and responsible fiscal future, cities in developing countries must use significant sources of tax revenues as well as nontax revenues in the form of user charges and fees. Adequacy of own revenues is the key to improved ability to deliver needed goods and services and to better accountability of local officials to their constituents. Own revenues need to be complemented with intergovernmental transfers to address differences in expenditure needs and fiscal capacity across cities and also for cities to support the implementation of central government programs.

There are both conventional and innovative sources of local government financing. Key issues that need to be addressed include what are the best-suited sources of tax revenue for cities in developing countries, can charges and fees become a more meaningful part of city budgets in developing countries and what is role various charges and fees play in city budgets in developing countries

Methodology

$$\%\ of\ revenue\ collected\ from\ endogenous\ sources\ = 100\ \mathrm{X}\ [\frac{\text{Revenue generated from internal sources}}{\text{Total local government finances}}]$$

Own source revenue = Total revenue a local authority collects from property taxes, charges and fees, betterment levies, vehicle and transportation taxes, local business taxes, excise and sales taxes, income taxes, and natural resource taxes

Total local finances = Own source revenue + central government transfers to the local authority + grants and loans from donors, banks etc. + other sources of financial resources

Disaggregation:

Data to be provided at the city level

Data Sources

Municipal authorities, metropolitan authorities, county governments, district governments

Collection process:

At the Global level, all this data can be obtained from local authorities.

Availability

Data are available in local authorities

Calendar

Annual monitoring until the year 2036.

Data providers

National Focal points nominated by respective Governments.

Data compilers

UNHABITAT

References

UN-Habitat, 2014, https://unhabitat.org/the-challenge-of-local-government-financing-in-developing-countries/

UN-Habitat, 2017, https://unhabitat.org/books/finance-for-city-leaders-handbook-2nd-edition/

59: Quality of law

Measured through:

a) Do subsidiary[105] laws consistently state their objectives and cite the statutory source for the objectives? (Regulatory measures/laws/by-laws in this area have consistent objectives based on clear policies).

b) Clarity of: decisions made; criteria to apply; identity of the decision makers; and time frames (Processes are clearly defined and outcomes of decisions do not involve any discretion.)

c) Organization of institutional roles and responsibilities (Institutional roles and responsibilities in this sector are concentrated in one efficient institution or in several well-coordinated institutions.)

d) Clarity in standard of drafting (Legislative texts are written in clear and unambiguous language, understandable by professionals and common citizens.)

e) Capacity for implementation (Human and financial resources are adequate for the successful implementation of the legislative framework in this area.)

Definition:

This indicator is for monitoring whether the governance structure has supportive legal and policy frameworks that enhance the government to implement urban policies. In this context, Quality of law is measured through:
a) Do subsidiary laws consistently state their objectives and cite the statutory source for the objectives? (Regulatory measures/laws/by-laws in this area have consistent objectives based on clear policies).
b) Clarity of: decisions made; criteria to apply; identity of the decision makers; and time frames (Processes are clearly defined and outcomes of decisions do not involve any discretion.)
c) Organization of institutional roles and responsibilities (Institutional roles and responsibilities in this sector are concentrated in one efficient institution or in several well-coordinated institutions.)
d) Clarity in standard of drafting (Legislative texts are written in clear and unambiguous language, understandable by professionals and common citizens.)
e) Capacity for implementation (Human and financial resources are adequate for the successful implementation of the legislative framework in this area.)

Rationale:

This indicator monitors the existence of legal and policy frameworks that ensure that there are forums that allow effective participation of groups in decision-making, planning and follow-up processes as well as implementation of effective local and metropolitan multilevel governance. It also monitors whether there exists appropriate political, fiscal and administrative decentralization based on the principle of subsidiarity (NUA §41, 89 and 90).

Methodology

Computation Method:

[105] Subsidiary legislation, in this context, legislation by a local authority, such legislation includes orders in council, rules, regulations, statutory instruments or by-laws.

Tick the correct answer:

a) Do subsidiary laws consistently state their objectives and cite the statutory source for the objectives? (Regulatory measures/laws/by-laws in this area have consistent objectives based on clear policies).

Yes	
Somewhat	
No	

b) Clarity of: decisions made; criteria to apply; identity of the decision makers; and time frames (Processes are clearly defined and outcomes of decisions do not involve any discretion.)

Yes	
Somewhat	
No	

c) Organization of institutional roles and responsibilities (Institutional roles and responsibilities in this sector are concentrated in one efficient institution or in several well-coordinated institutions.)

Yes (well-coordinated)	
Somewhat	
No	

d) Clarity in standard of drafting (Legislative texts are written in clear and unambiguous language, understandable by professionals and common citizens.)

Clear	
Not clear	

e) Capacity for implementation (Human and financial resources are adequate for the successful implementation of the legislative framework in this area.)

Adequate	
Not adequate	

Disaggregation:

Data to be provided at national and city level.

Data Sources

At the national level the respondent will be in the Ministry selected by the government as the focal point for this indicator. A senior level civil servant would be well placed to provide answers for this indicator.

At the city level, a director of a department in the city council can be the provide the information.

Collection process:

At the Global level, send information to UNHABITAT-GUO, unhabitat-guo@un.org.

The monitoring of the indicator can be 5 years until the year 2036.

Data compiler

UNHABITAT

60: Published performance delivery standards at the sub-national level

Definition:

One way to ensure that local and subnational governments to deliver services at an acceptable level of quality is for these governments to publish their performance delivery standards on their websites in advance. The citizens can then be in position to verify whether those performance delivery standards are met in the course of the year.

Rationale:

Performance benchmarking and periodic monitoring is central to improving performance. Local governments can be held accountable for their performance[106]. A major challenge measuring efficiency and effectiveness is the lack of market prices for services delivered by local governments. Mizell (2008) concludes that performance indicators enhance the efficiency and effectiveness of local governments. Indicators can also monitor whether national or local objectives are being achieved in terms of quality, quantity and equity of the services being produced. City and subnational governments provide different services depending on countries. In Ireland, an annual report on performance indicators is produced and submitted to the Minister of Local Government Management, it is also available to wider audience who can download it on the department website. [107]

Local governments can use the indicators to monitor their performance and determine whether they are meeting their performance standards. They can also compare their performance with that of local governments/ city councils. The indicators can form the basis of budget allocations and identification of best practices. Hence, a lack of performance indicator systems is often a lost opportunity for sharing best practices. An example of municipal performance indicators is the "Municipal Performance Index 2019: Assessment Framework"[108] by Ministry of Housing and Urban Affairs – Government of India.

Methodology

Does your city or sub-national government have Published performance delivery standards that are published on its official website?

Yes	
No	

Is data on the performance indicator updated monthly/quarterly during the fiscal year?

Yes	
No	

[106] Phillips, L. (2018), "Improving the Performance of Sub-national Governments through Benchmarking and Performance Reporting", OECD Working Papers on Fiscal Federalism, No. 22, OECD Publishing, Paris, https://doi.org/10.1787/ffff92c6-en.
[107] Mizell, L. (2008), "Promoting performance – Using indicators to enhance the effectiveness of sub-central spending", OECD Working Papers on Fiscal Federalism, No. 5. http://dx.doi.org/10.1787/22265848.
[108] Ministry of Housing and Urban Affairs – Government of India, IFC-Institute of Competitiveness, "Municipal Performance Index 2019: Assessment Framework", https://smartnet.niua.org/eol19/pdf/MPI_Methodology.pdf

Computation Method:

$$\%\ of\ sub-national\ governments\ and\ cities\ with\ Published\ performance\ delivery\ standards = 100\ X\ [\frac{\text{sub} - \text{national governments and cities with Published performance delivery standards}}{\text{Total sub} - \text{national governments and cities}}]$$

Disaggregation:

Data to be provided as national level. Lists of cities that published performance delivery standards and those that don't should also be provided.

Data Sources

The Ministry responsible for urban issues is the focal point for this indicator, it can survey or check the cities websites to find out which ones have published performance delivery standards.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be annual until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

1. Phillips, L. (2018), "Improving the Performance of Sub-national Governments through Benchmarking and Performance Reporting", OECD Working Papers on Fiscal Federalism, No. 22, OECD Publishing, Paris, https://doi.org/10.1787/ffff92c6-en.

2. Mizell, L. (2008), "Promoting performance – Using indicators to enhance the effectiveness of sub-central spending", OECD Working Papers on Fiscal Federalism, No. 5. http://dx.doi.org/10.1787/22265848.

3. Ministry of Housing and Urban Affairs – Government of India, IFC-Institute of Competitiveness, "Municipal Performance Index 2019: Assessment Framework", https://smartnet.niua.org/eol19/pdf/MPI_Methodology.pdf

61 Number of countries, regional governments, and cities in which plans and designs are publicly accessible to residents (on-line) and can be consulted at all times

Definition:

Well planned and implemented urban and territorial plans can bring sustainable development to both developing and developed countries. This indicator measures “Number of countries, regional governments, and cities in which plans and designs are publicly accessible to residents (on-line) and can be consulted at all times”

Rationale:

One way of maintaining the public support for plans as well as ensuring public participation is for the urban and territorial plans to be publicly accessible online. This ensures transparent and accountable governance, and urban inhabitants are able to provide feedback on the plans, which in turn allows them to take ownership of plans (NUA §86).

Methodology

A focal point in ministry can go through websites of all cities and the ministry in charge of local governments to find out which ones have urban and territorial plans on their websites.

Disaggregation:

Data to be provided at national, provincial and city level. Some countries may have urban plans at provincial or state level, while others may not have provincial plans.

Data Sources

The Ministry selected by the government as the focal point for this indicator.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be every two years until the 2036.

Data compiler

UNHABITAT

References

The New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf

62 Number and per cent of new population “accommodated” in a plan or city extension.

Definition:

This indicator measures the number and per cent of new population “accommodated” in a plan or city extension.

Rationale:

International Guidelines on Urban and Territorial Planning recommends using urban and territorial planning to increase densities of parts of cities that are lightly populated utilizing infill or planned extension strategies to achieve economies of scale, reduce travel needs and the costs of service provision, and enable a cost-effective public transport system[109].

Methodology

Computation Method:
Enumerate the population in infill or planned extensions, then express it as percentage of the total population of the city.

Disaggregation:
City level.

Data Sources

The Ministry selected by the government as the focal point to obtain the data from each city.

Collection process:
At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The indicator to be monitored twice a year until 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compiler

UNHABITAT

Reference

UNHABITAT, 2015, “International Guidelines on Urban and Territorial Planning”, HS Number: HS/059/15E, page 19, https://unhabitat.org/books/international-guidelines-on-urban-and-territorial-planning/

[109] UNHABITAT, 2015, “International Guidelines on Urban and Territorial Planning”, HS Number: HS/059/15E, page 19

63 Number of urban planners per 100,000 persons

Definition:

The New Urban Agenda calls for planning and managing spatial urban development. There must be enough urban planners in a country to prepare and implement urban plans. In this regard, the New Urban Agenda calls for improved capacity for urban planning and design and the provision of training for urban planners at all levels of government (NUA §102). This indicator monitors the number of urban planners per 100,000 persons.

Rationale:

Proper Implementation of urban and territorial plans requires political will, legal and institutional frameworks, efficient urban management, good coordination. In addition, there must be sufficient qualified urban planners, continuous monitoring and timely adjustment as necessary.

This indicator is related to 64 “Number of planners registered in a country in the public sector”.

Methodology

There are a number of the ways getting a list of urban planners. They include requesting information from the national association of urban planners, local and central governments departments that employ urban planners as well as firms that carry out urban planning consultancies.

Disaggregation:

Data to be provided at national level.

Data Sources

The Ministry selected by the government as the focal point for this indicator. Some data can come from the cities directly and urban planning associations.
At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be every two years until the year 2036.

Data providers

National Focal points will nominated by respective Governments.

Data compilers

UNHABITAT

References

UNHABITAT, 2015, ‘Guidelines on Urban and Territorial Planning’, page 27, HS/059/15E, https://unhabitat.org/books/international-guidelines-on-urban-and-territorial-planning/

64 Number of planners registered in a country in the public sector

Definition:

Cities account for most of the economic production in most countries. Cities have also led economic development during industrialization. However, poorly planned urbanization leads to increased pollution, urban sprawl, environmental degradation. Consequently, in the New Urban Agenda, Member States emphasized the need for urban planning that focuses on sustainable development, inclusive growth, participating planning and good governance.[110]

Planned urbanization requires that country should have a critical mass of urban planners to prepare urban and territorial plans and participate in enforcement adherence to those city plans. This indicator will be used to monitor the number of planners registered in a country in the public sector. It is these planners who will prepare the urban plans and implement them.

Rationale:

Sustainable urbanization cannot occur without urban plans. Urban planners are essential for preparation and implementation of urban plans. This indicator will gauge whether a country has the urban planning capacity to implement urban and territorial plans. The New Urban Agenda calls for implementation of integrated planning that leads to high quality of life and sustainable environment and introduces innovations that results in better living environments (NUA §94).

This indicator is related to indicator 63 **"**Number of urban planners per 100,000 persons".

Methodology

Disaggregation:

Data to be provided at national and city level.

Data Sources

The Ministry indicator (Ministries of town planning or local government could be the focal) selected by the government as the focal point for this. Some data can come from the cities directly.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

[110] UNHABITAT, "World Cities Report 2016", abridged version, page 27

The monitoring of the indicator could every two years until the year 2036.

Data providers

National Focal points will nominated by respective Governments.

Data compilers

UNHABITAT

Reference

1. UNHABITAT, “World Cities Report 2016”, abridged version, page 27
2. The New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf

65 Percentage of urban population living in small and intermediate cities and towns

Definition:

Percentage of urban population living in small and intermediate cities and towns. The 2016 World Cities Report classified cities by population size as follows: small cities (100,000 - 500,000); intermediate cities (500,000 - one million); large cities (one to five million); and very large cities (over five million)[111].

Rationale:

The New Urban Agenda calls for the implementation of integrated, polycentric and balanced territorial development policies and plans that strengthen the role of small intermediate cities and towns (NUA §95). The total urban population in developing countries jumped from 267.6 million in 1950 to 972.4 million in 1980. However, the share of urban population in cities with populations between 20,000 and 100,000 declined from 22.2% to 10.5% over the same period[112]. Hence, there was unbalanced urbanization, most of the growth in urban population occurred in big cities. The call for strengthening the role of small and intermediate cities and towns necessitates the need for monitoring the share of urban population living in small and intermediate cities and towns.

The International Conference on Population in September 1994 observed that in many countries the urban system is dominated by a single major city or agglomeration. The concentration of population in primate cities and megacities on one hand poses social and environmental challenges while on the other-hand large agglomerations account for major share of economic production and cultural activity[113]. Good data on the distribution of the urban population will enable central and local governments to anticipate and plan for the urban growth in a sustainable way.[114]

Methodology

Computation Method:

The national statistical offices can provide this data in for census years and can estimates population sizes for years between censuses.

Disaggregation:

Data to be provided at national level.

[111] World Cities Report 2016 page 84.
[112] United nations Fund for Population Affairs, International Conference on Population and the Urban Future, Chapter R/E/3, September 1-4, 1980, Rome
[113] Report of the International Conference on Population and Development, page 64, September 1994, A/CONF.171/13/Rev.1
[114] Dhaka Declaration, Recommendation #12, Population Dynamics in the Post-2015 Development Agenda, Report of the Global Thematic Consultation on Population Dynamics, ISBN 978-0-89714-020-1

Data Sources

National statistical office.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Data Availability

Data available? From whom?

Calendar

The monitoring of the indicator can be every two years until the year 2036.

Data providers

National Focal points will nominated by respective Governments.

Data compilers

UNHABITAT

66 a) Existence of structure or office or committee or taskforce for implementing the New Urban Agenda;
b) Integration of New Urban Agenda in national urbanization and infrastructure strategies / plans.

Definition:

UNHABITAT recommends that the preparation of the Report on the Implementation of the New Urban Agenda should be led by the ministry dealing with urbanization in a country. National Habitat Committees (NHC) and National Urban Forums (NUF), where they exist, should either play a major role or lead the preparation of the Report [115].

The first part of the indicator seeks to determine whether there is an office or committee or taskforce for implementing the New Urban Agenda.
The second part of the indicator determines whether the New Urban Agenda has been integrated into the national urbanization and infrastructure plans.

Rationale:

The New Urban Agenda encourages the implementation of sustainable urban and territorial planning, including city-region and metropolitan plans, development of sustainable regional infrastructure projects that increase economic growth, promotion of inclusive economic growth in both rural and urban areas (NUA §96). The commitments that Member States made should be integrated into the city-region, metropolitan and territorial plans.

Methodology

The Ministry responsible for urbanization to send documents to UNHABITAT that state the office, committee or taskforce responsible for implementing the New Urban Agenda and demonstrating that the New Urban Agenda has been integrated into including city-region, metropolitan and national urban plans.

Disaggregation:
National, regional and city level.

Data Sources

The Ministry responsible for urbanisation.
At the Global level, National focal points should send information to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

Indicator to be updated annually until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

[115] UNHABITAT, 2019, "The Guidelines for Reporting on the Implementation of the New Urban Agenda", page 4,

References

1. The New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf
2. UNHABITAT, 2019, “The Guidelines for Reporting on the Implementation of the New Urban Agenda”, page 4

67 Stable existence of “transfer formula” in the last 5 years, without major changes, meaning reductions of more than 10%.

Definition:

Usually, local governments receive support in the form of intergovernmental transfers, whereby national governments allocate a portion of their revenue to their local counterparts (UN-Habitat, 2017).

Rationale:

In the New Urban Agenda (NUA), Member States committed themselves to promoting sound and transparent systems for financial transfers from national governments to subnational and local governments based on the latter’s needs, priorities, functions, mandates and performance-based incentives, as appropriate, in order to provide them with adequate, timely and predictable resources and enhance their ability to raise revenue and manage expenditures (NUA 135).

Member States also acknowledged the importance of local governments as active partners in the follow-up to and review of the New Urban Agenda at all levels and encourage local governments to develop, jointly with national and subnational governments, as appropriate, implementable follow-up and review mechanisms at the local level, including through relevant associations and appropriate platforms (NUA 163).

Concepts:
Intergovernmental transfers are the dominant source of revenues for subnational governments in most developing countries. The design of these transfers is of critical importance for efficiency and equity of local service provision and fiscal health of subnational governments (World Bank, 2001).

Methodology

Computation Method:
Has there been a stable “transfer formula” in the last 5 years, without major changes, meaning reductions of more than 10%?

Yes	
No	

The Ministry that is the focal point for getting information on this indicator, should collect data on all cities and subnational governments and compute the percentage of cities that answer “Yes”.

$$\%\ of\ cities\ and\ subnational\ governments\ that\ have\ a\ stable\ formula$$

$$= 100\ [\frac{\text{cities and subnational governments that have a stable formula}}{\text{Total number of cities and subnational governments}}]$$

Disaggregation:
Data to be provided at city level and for subnational governments.

Data Sources

Municipal authorities, metropolitan authorities, county governments, district governments

Collection process:

At the national level, all this data will be collected cities and subnational governments by Ministry nominated by respective government to collect this information.

Calendar

Annual monitoring of the indicator until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compiler

UNHABITAT

References

UN-Habitat, 2017, "Finance for City Leaders Handbook", https://unhabitat.org/books/finance-for-city-leaders-handbook-2nd-edition/

World Bank, 2001, "Intergovernmental Transfers/Grants Design", http://www1.worldbank.org/publicsector/decentralization/fiscal.htm

68 Existence of at least one municipal finance or infrastructure fund available for local governments

Definition:

Municipal finance matters for the sustainability of local government provision of goods and services. Local governments are uniquely suited to respond to challenges of poverty, education, water, and the environment; an over-reliance on central government and international institutions risks the danger that responses become out of touch with local people and therefore harder to implement. Without strong and consistent revenue flows, it is not possible to develop sustainable towns and cities. One implication of this is that municipal authorities will lack the resources that they need to effectively plan for the impact of urbanization. This is likely to have a negative effect both on the livelihoods of citizens but also on the way in which high levels of in-migration impact the environment. In turn, this can have long-term implications for residents' quality of life and for the ability of the area to attract investment in the longer term. Therefore, developing more effective municipal financing or infrastructure funds are essential (UN-Habitat, 2017).

Rationale:

In the New Urban Agenda (NUA), Member States committed themselves to supporting effective, innovative and sustainable financing frameworks and instruments enabling strengthened municipal finance and local fiscal systems in order to create sustainable urban development in an inclusive manner (NUA §15, c, iv). They also committed to supporting the creation of robust legal and regulatory frameworks for sustainable national and municipal borrowing, on the basis of sustainable debt management, supported by adequate revenues and capacities and the establishment of appropriate financial intermediaries for urban financing, such as regional, national, subnational and local development funds or development banks, including pooled financing mechanisms, which can catalyse public and private, national and international financing. In addition, they would promote risk mitigation mechanisms such as the Multilateral Investment Guarantee Agency, while managing currency risk (NUA §139). Member States would also encourage the use of official development assistance, which promotes additional resource mobilization from all available sources, public and private, for sustainable urban and territorial development (NUA §145).

Concepts:

For the sustainability of cities, their ability to raise revenues from sources under their control is critical in the medium to long term. The costs that local governments face is likely to increase every year in line with the processes of urbanization taking place around the world. Thus, raising local revenues is among the most pressing challenges facing city leaders today. It would normally be assumed that a growing population increases the tax base proportionately, with a greater number of local residents simply paying in line with the greater number of services provided. However, this common assumption has been proven wrong. First, changing demographics go hand-in-hand with changes in lifestyle, economic specializations, and income distribution. These shifts mean that citizens do not always have the same needs from their local governments as before and will change how they contribute to the funding of local government services. Second, an increase in the local population does not usually lead to immediate adjustments by central governments in the amounts transferred to the local level. As the "front line" when it comes to delivering public goods and services, local governments often need to respond immediately to changing circumstances while there are time lags in altering rates of national government transfers (UN-Habitat, 2017)

In the face of this dilemma, municipal revenues are city leaders' best asset. Because they are under the control of local authorities themselves, they can be made to shift in proportion to changing demographics and lifestyles in a way that

strengthens the provision of public services. As a population changes, local governments are able to change too. Local Governments need to achieve sustainable sources of finance to be able to invest in urban infrastructure and offer basic services.

Methodology

Computation Method:

Is there at least one municipal finance or infrastructure fund available for local governments?

Yes	
No	

Disaggregation:

Data to be provided at national level.

Data Sources

Ministry responsible for municipalities.

Data compiler

UNHABITAT to get information for this indicator from the national focal point.

References

UN-Habitat, 2017, "Finance for City Leaders Handbook", https://unhabitat.org/books/finance-for-city-leaders-handbook-2nd-edition/

69 Percentage of local/sub-national government's financial resources generated from financial intermediaries such as multilateral institutions, regional development banks, subnational and local development funds, or pooled financing mechanisms.

Definition:

Local authorities in all parts of the world play an increasingly important role in the delivery of fundamental basic public services. But they also face huge challenges. Most cities in developing countries depend largely on central government transfers and to a lesser extent on revenues derived from own sources of revenue (property taxation and service charges). To effectively address the challenge of mobilizing adequate financial resources, urban authorities in developing countries should also use mechanisms such obtaining loans and or grants from financial intermediaries (e.g. multilateral institutions, regional development banks, subnational and local development funds) and pooled financing mechanisms (UN-Habitat 2014, 2017).

Rationale:

In the New Urban Agenda (NUA), Member States committed themselves to:

Support the creation of robust legal and regulatory frameworks for sustainable national and municipal borrowing, based on sustainable debt management, supported by adequate revenues and capacities, by means of local creditworthiness as well as expanded sustainable municipal debt markets when appropriate. We will consider the establishment of appropriate financial intermediaries for urban financing, such as regional, national, sub-national, and local development funds or development banks, including pooled financing mechanisms, which can catalyse public and private, national, and international (NUA §139),

Consider establishing urban and territorial transport infrastructure and service funds at the national level, based on a variety of funding sources, ranging from public grants to contributions from other public entities and the private sector, ensuring coordination among actors and interventions as well as accountability (NUA §141),

Support access to different multilateral funds, including the Green Climate Fund, the Global Environment Facility, the Adaptation Fund, the Climate Investment Funds, among others, to secure resources for climate change adaptation and mitigation plans, policies, programmes, and actions for sub-national and local governments, within the framework of agreed procedures. We will collaborate with sub-national and local financial institutions, as appropriate, to develop climate finance infrastructure solutions and to create appropriate mechanisms to identify catalytic financial instruments, consistent with any national framework in place to ensure fiscal and debt sustainability at all levels of government (NUA §143).

Concepts:

Municipal borrowing: The capital market is the largest source of private capital in both equity and debt. It exists in various forms, including savings accounts, balances in commercial banks and savings societies, savings in national social security and pension funds, insurance life funds and compulsory savings schemes. Borrowing from the capital market is a way to generate additional revenue for municipalities. But to be able to borrow, cities need to first demonstrate they are creditworthy. Creditworthiness is a determining factor that investors and banks use to assess risks involved in lending to municipal governments. Borrowing from the capital market by issuing muncipal bonds

Institutional investors*:* Institutional investors such as pension funds and insurance companies in some countries finance infrastructure projects. Privately managed pension funds also do finance infrastructure projects. However, in many

countries there do not exist necessary regulatory and supervisory mechanisms. In many cases, the existing regulatory frameworks are overly restrictive.

Municipal development funds*:* Municipal development funds are state institutions that lend to local authorities for financing urban infrastructure and services. They are financial intermediaries that assist local authorities in building self-sustainable municipal credit systems that can mobilize funds from both domestic and international capital markets. Loan mechanisms that municipal development funds use are quite like the procedures employed by the World Bank and regional development banks in international lending. A big advantage of municipal development funds is that they can lend to many local authorities as well as provide small loans. It is important to recognize the fact that municipal development funds do not provide direct loans to finance poverty alleviation programmes. But they do contribute to poverty alleviation efforts through improved urban infrastructure and services and public spaces.

Corporate bonds: There is evidence that corporate bonds issuers are interested in operating in infrastructure sectors. In many African countries, corporate bonds are more likely to be used for infrastructure financing than local bank loans, government bonds or equity issues.

Pooled Financing: The aim of pooled fincing is to provide credit enhancement facilities to local authorities based on their credit worthiness. This will enable them to access market borrowings through state-level pooled mechanism. Funds can be used to provide urba infrastructure and services.

Methodology

$$\%\ of\ local\ government\ financial\ resources\ generation\ from\ financial\ intermediaries\ = 100\ X\ [\frac{\text{Financial resources generated by local authority from financial intermediaries}}{\text{Total local govenment finances}}]$$

Disaggregation:

Data to be provided at the city level

Data Sources

Municipal authorities, metropolitan authorities, county governments, district governments

Collection process:

At the Global level, all this data can be obtained from local authorities.

Data Availability

Data is available in local authorities

Calendar

The monitoring of the indicator can be annual until the year 2036.

Data providers

National Focal points nominated by respective Governments.

Data compiler

UNHABITAT

References

UN-Habitat, 2014, https://unhabitat.org/the-challenge-of-local-government-financing-in-developing-countries/

UN-Habitat, 2017, https://unhabitat.org/books/finance-for-city-leaders-handbook-2nd-edition/

70 Number of cities participating in city to city programmes

Definition:

This indicator counts the number of cities that are participating in at least one city to city programmes like those of the United Cities and Local Government (UCLG) (https://www.uclg.org/en/issues/city-city-cooperation) and SisterCities International (https://sistercities.org/). Sister cities are long-term partnerships between two communities in two countries[116].

Rationale:

Cities learn through exchanges with other cities through city networks and city to city exchanges. Members of SisterCities International work diligently towards promoting harmony and understanding through exchanges and initiatives in the fields of arts and culture, youth and education, business and trade, and community development. City to city and Sister city relationships offer the flexibility to form connections between communities that are addressing mutually beneficial issues.

Methodology

UNHABITAT to count cities that are participating in at least one city to city partnership utilizing the membership lists of city to city programmes.

Disaggregation:

Data to be provided at city level.

Data Sources

UCLG, SisterCities International *etc.*

Calendar

Annual monitoring of the indicator until the year 2036.

Data compilers

UNHABITAT

References

SisterCities International, https://sistercities.org/

United Cities and Local Government (UCLG) (https://www.uclg.org/en/issues/city-city-cooperation)

[116] SisterCities International, https://sistercities.org/

71 Percentage of cities and subnational governments with staff trained in formulation, implementation, managing, monitoring and evaluation of urban development policies

Definition:

Cities are the engines that power modern economies. Cities develop well, faster and generate more output if they are well planned. Well-designed urban plans are a prerequisite for resource efficient and sustainable cities. Well qualified city/subnational staff are required to prepare integrated long-term cross-sectoral plans and to implement and implement such plans and policies.[117]

This indicator will measure the percentage of cities and regional governments with staff capability to formulate, implement, manage, monitor and evaluate of urban development policies.

Rationale:

Urban planning is key cities to achieving sustainable development. Such transformation does not occur spontaneously. First there has to be a vision, then an urban and territorial plan has to be prepared. Pressing issues, priorities and available resources are identified in the Plan[118]. Unplanned urbanization (unplanned spatial patterns) is inefficient and leads to inefficient use of resources, such unnecessarily long commutes, poor connectivity and traffic congestion.

Some of obstacles to urban planning are weak capacity to develop and implement plans; lack of good legal frameworks and lack of vision. It is best that cities adopt a demand driven and modular frameworks that are implementable and can have impacts in the short to medium term. The capital and recurrent costs over the whole duration of the plan should be well estimated. The impact of the plan should be evaluated regularly, and necessary adjustments made. All these steps highlight the need for having adequate trained staff in plan and implement city plans.

Methodology

Percentage of cities and subnational governments with staff trained in formulation, implementation, managing, monitoring and evaluation of urban development policies

$$= 100 \text{ X } [\frac{\text{Number of cities and subnational governments with staff trained in formulation, implementation ...}}{\text{Total number of cities and subnational governments in a country}}]$$

Disaggregation:
National level.

Data Sources

The Ministry selected by the government as the focal point for this indicator. The Ministry will collect information on the staff of cities capacity to formulate, implement, manage, monitor and evaluate of urban development policies.

Collection process:

[117] UNHABITAT, "Urban Planning for City Leaders", https://unhabitat.org/urban-planning-for-city-leaders-2/
[118] *Ibid* page 13.

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator every two years until the year 2036.

Data providers

National Focal points nominated by respective Governments.

Data compilers

UNHABITAT

References

UNHABITAT, “Urban Planning for City Leaders”, https://unhabitat.org/urban-planning-for-city-leaders-2/

72 Size of budget of local government associations

Definition:

Local government associations represent local government, coordinating the positions of local governments in dealing with the central government to draw attention and resources to the associations' priority areas.
The indicator is "Size of the budget of local government associations" in USD

Rationale:

Local government associations work towards strengthening local government's capabilities and providing support for specific issues that are of high priority most local government. It is important to have a substantial budget in order to advocate with adequate substantive support for the associations' positions.

Methodology

Sum the budget of all local government associations, if there more than one. Present the budget in USD.

Disaggregation:

Data to be provided at national level.

Data Sources

The Ministry selected by the government as the focal point for this indicator.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be every two years until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

References

Local Government Association, https://www.local.gov.uk/about

73 Number of people who have been trained in the use of land-based revenue and financing tools by UN-Habitat or other institutions

Definition:

Land-based financing can make an important contribution to achieving sustainable and equitable cities and properly serviced communities. UN-Habitat and the Global Land Tool Network (GLTN) have developed the following tools under this theme:

1. A publication on Innovative Land and Property Taxation
2. A Trainer's Guide and accompanying Reader on seven Land-based Financing instruments
3. A Policy Guide on Valuation of Unregistered Land and Properties.

The indicator is for monitoring the number of people who are trained in the use of land-based revenue and financing tools by UN-Habitat or other institutions.

Rationale:

Land is a revenue source of great potential. It has been successfully leveraged for hundreds of years in many countries and is now receiving increasing attention in many others. Tapping land as a revenue source tends to have fewer negative impacts than many other revenue tools. This because of the unique way it allows local authorities to combine financial, economic, spatial and social benefits. In addition, it can help to build reciprocal relationships of accountability between citizens and government.

Key to local governments' financial autonomy is their ability to generate revenue. One of the innovative ways of raising local government revenue is the use of land-based revenue and financing tools developed by UNHABITAT and its partners. A prerequisite of use of such tools is the availability of trained central and local government staff trained in their use. In this vein, the New Urban Agenda calls for promotion of capacity-development programmes for policymakers and local public officials on the use of legal land-based revenue and financing tools, focusing on the legal and economic foundations of value capture and distribution of land value increments (NUA §152).

Methodology

UNHABITAT will compile a list of people trained in the use of land-based revenue and financing tools by UN-Habitat or other institutions by country.

Disaggregation:

Data to be provided at city and national level, this should include staff working at both national and local levels.

Data Sources

Local and city authorities, GLTN, UNHABITAT and partner institutions

Calendar

The monitoring of the indicator will be every two years until 2036.

Data compiler

UNHABITAT

Reference:

1. Global Land Tool Network, 'Land-based Financing', https://gltn.net/land-based-financing/
2. The New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf

Existing products that support the land-based finance work of UN-Habitat:

3. *Leveraging land: Land-based finance for Local Governments*, including a Reader and a Trainer's Guide (in English but currently being translated into French), with an Implementation Guide in the pipeline. The *Reader* is available at https://gltn.net/download/leveraging-land-land-based-finance-for-local-governments-a-reader/. The *Trainer's Guide* is available at https://gltn.net/2016/12/05/leveraging-land-land-based-finance-for-local-governments-a-trainers-guide/
4. *Innovative Land and Property Taxation*, including a policy guide. Available at https://gltn.net/2011/10/31/innovative-land-and-property-taxation-eng-2011/
5. *Valuation of Unregistered Lands: A Policy Guide*. Available at https://gltn.net/2018/05/02/valuation-of-unregistered-lands-a-policy-guide/
6. *Property Theory, Metaphors and the Continuum of Land Rights.* Available at https://gltn.net/2016/10/27/property-theory-metaphors-and-the-continuum-of-land-rights/
7. *Fit-for-purpose Land Administration: Guiding principles for country implementation*. Available at https://gltn.net/download/fit-for-purpose-land-administration-guiding-principles-for-country-implementation/
8. The Social Tenure Domain Model, various resources including technical guides available at https://stdm.gltn.net/documentation/
9. Gender aspects of land:
   - *Gender Evaluation Criteria for Large-scale Land Tools*. Available at https://gltn.net/download/gender-evaluation-criteria-for-large-scale-land-tools/
   - *Designing and Evaluating Land Tools with a Gender Perspective: A training package for land professionals*. Available at https://gltn.net/download/designing-and-evaluating-land-tools-with-a-gender-perspective-2011/
   - *Good land governance through gender empowerment and grassroots participation*. Available at https://gltn.net/download/improving-gender-equality-and-grassroots-participation-through-good-land-governance-a-training-package-eng-2010/
   - *Women and Land in the Muslim World. Pathways to increase access to land for the realization of development, peace and human rights.* Available at https://gltn.net/2018/02/22/women-and-land-in-the-muslim-world-2/
10. *Guide to Land Mediation* https://gltn.net/download/guide-to-land-mediation/?wpdmdl=8241&refresh=5d0368d913b501560504537
11. *Training Package Toolkit: Tools to support Transparency in Land Administration.* Available at https://gltn.net/2016/03/29/training-package-toolkit-tools-to-support-transparency-in-land-administration/

74 Percentage of cities/subnational staff trained in financial planning and management

Definition:

The indicator measures local government staff trained up bachelor's degree level or certified public accountant (or equivalent) as a percentage of total local government staff.

Rationale:

One of the aims the New Urban Agenda is to promote capacity development programmes of subnational and local governments in financial planning and management. A prerequisite of efficient local government financial administration is having qualified staff in the areas of financial planning and management as well as accounting.

Methodology

Computation Method:

These two questions below should be posed to a senior staff member of city council or subnational government such as a director of a department.

a) $Percentage\ of\ city\ or\ subnational\ staff\ trained\ in\ financial\ planning\ and\ management = \left[\frac{\text{Number of city or local government staff trained in finance or accounting}}{\text{Total number of staff in a city or local govenment}}\right]$

b) Does the city or subnational government have sufficient staff trained in finance or accounting?

Yes	
No	

Disaggregation:

Data to be provided at city and subnational level. The national focal point will aggregate part "a "to find a national average, the from answers to part "b", compute the number of cities responding as "Yes" as percent of the total.

Data Sources

The Ministry selected by the government as the focal point for this indicator, will aggregate responses from cities and subnational governments.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

Annual monitoring of the indicator until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compilers

UNHABITAT

75 Percentage of cities utilizing e-governance and citizen-centric digital governance tools

Definition:

e-Governance deals with the relationship and networks within government regarding the usage and application of Information and Communication Technologies (ICTs)[119]. It facilitates more efficient, more accountable government and inclusive democracy. In this context, government services can be grouped into: Government-to-Citizen(G2C); Government-to-business (G2B); Government to NGO (G2N); Government-to-Government (G2G) and Government-to-Employee (G2E).

Rationale:

Local governments are crucial to delivering sustainable development goals, especially goal 11 and other urban related goals. Local governments operate closer to citizens than central governments, hence they are more able to assist vulnerable groups and ensuring that "no one is left behind". Local government internet-based services improve residents' access to services and improve their participation in local decision-making[120].

E-governance can improve the speed of delivery and transparency of government services, it is beneficial to city governments, residents, businesses, city employees and non-government organizations. Fast service delivery allows residents and businesses to have more time for productive work. E-governance tools can ensure that government services are delivered transparently. It much easier to hold governments to account since the speed of delivery of services including wait times can be analyzed and action taken to speed up delivery.

The challenges of e-governance include cyber-crimes such as: denial of service; spoofing, tampering, repudiation, disclosure, etc. City governments have to invest in ICT infrastructure and capacity building of their ICT staff.

Concepts:

E-governance (Electronic governance) utilizes information and communication technology (ICT) to deliver government services efficiently and effectively online to citizens, businesses, and other organizations, thus improving government services. One example is e-participatory budgeting online forums in Belo Horizonte (Brazil) in 2008 and 2011: citizens discussed public projects proposed by the city council and voted for the ones that they preferred[121].

Methodology

[119] William Sheridan and Thomas B. Riley "Comparing e-Government Vs. e-Governance", 2010, https://www.geospatialworld.net/article/comparing-e-government-vs-e-governance/

[120] Department of Economic and Social Affairs, "United Nations E-Government Survey 2018", chapter 7 "Improve Cities Resilience and Sustainability through e-Government Assessment", https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2018-Survey/E-Government%20Survey%202018_FINAL%20for%20web.pdf?source=post_page----------

[121] Samuel Barros and R. Sampaio, "Do Citizens Trust Electronic Participatory Budgeting? Public Expression in Online Forums as an Evaluation Method in Belo Horizonte", https://onlinelibrary.wiley.com/doi/epdf/10.1002/poi3.125

a) Does your city have self-service portal(s) (official e-government portal) for residents to make payments to the city/local government?[122] Please list all.

If the city has online self-service portals, does it over the following services:

Portal authentication

Yes	
No	

Personal Data updating

Yes	
No	

e-Procurement service

Yes	
No	

Address change notification

Yes	
No	

e-Payment

Yes	
No	

e-Participatory budgeting

Yes	
No	

Computation Method:

The extent of e-Governance varies greatly among cities, it depends on the extent of internet usage.

$$Percentage\ of\ cities\ providing\ a\ service = 100\ \text{X}\ [\frac{\text{Number of cities providing a service}}{\text{Total number of cities in country}}]$$

Disaggregation:

[122] Examples portals: https://epayments.nairobi.go.ke/ ; https://portal.311.nyc.gov/make-a-payment/

It is national. Percentage of cities in a country.

Data Sources

The Ministry selected by the government as the focal point for this indicator will survey all cities in the country.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be every two years until the year 2036.

Data providers

National Focal points will be nominated by respective Governments.

Data compiler

UNHABITAT

References

1. Department of Economic and Social Affairs, "United Nations E-Government Survey 2018", chapter 7 "Improve Cities Resilience and Sustainability through e-Government Assessment", https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2018-Survey/E-Government%20Survey%202018_FINAL%20for%20web.pdf?source=post_page----------
2. Samuel Barros and R. Sampaio, "Do Citizens Trust Electronic Participatory Budgeting? Public Expression in Online Forums as an Evaluation Method in Belo Horizonte", https://onlinelibrary.wiley.com/doi/epdf/10.1002/poi3.125
3. http://egovernancedigest.com/2017/04/definition-of-e-governance/
4. William Sheridan and Thomas B. Riley "Comparing e-Government Vs. e-Governance", 2010, https://www.geospatialworld.net/article/comparing-e-government-vs-e-governance/

76 Percentage of cities utilizing geospatial information systems

Definition:

The proportion of cities that utilize geospatial information systems (GIS) in their operations such as production of NUA Monitoring Framework indicators that require GIS techniques to produce.

Rationale:

The UN Conference on Sustainable Development in 2012 recognized the importance of geospatial information for monitoring and reliable geospatial information for sustainable development policymaking, programming and project operations[123]. The Conference also noted the importance of geospatial information when assessing economic and social damage during national disasters as well as its usefulness hazard and risk assessments. Consequently, it requested the international community to enhance international cooperation in support of disaster risk reduction in developing countries and support through their capacity-building and training[124]. Geospatial information systems improve urban and territorial planning, land administration and access to urban services.

Methodology

Computation Method:

$$Percentage\ of\ cities\ utilizing\ geospatial\ information\ systems = 100\ X\ [\frac{\text{Number of cities utilizing geospatial information systems}}{\text{Total number of cities in country}}]$$

Disaggregation:

Data to be provided at city level.

Data Sources

The Ministry selected by the government as the focal point for this indicator. The Ministry will conduct a survey that will find out which cities have GIS capabilities.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be every two years until the year 2036.

[123] UN Conference on Sustainable Development, 20 – 22 June 2012, Rio de Janeiro, Brazil, para 274, "The Future we want", https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf
[124] *Ibid*, para 187

Data providers

National Focal points nominated by respective Governments.

Data compilers

UNHABITAT

References

UN Conference on Sustainable Development, 20 – 22 June 2012, Rio de Janeiro, Brazil, para 187 & 274, “The Future we want”, https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf

77 Percentage of cities with capacity to monitor the implementation of urban development policies

Definition:

Percentage of cities with capacity to monitor the implementation of their urban development policies as demonstrated by their ability to collect regularly the indicators that are listed in this NUA monitoring framework plus other indicators that they deem appropriate. Alternatively, cities with capacity to effectively monitor implementation of urban development policies are those that produce the city-level NUA voluntary reviews based on indicators listed in this Framework or an assessment tool used in their country.

Rationale:

All city governments have to be accountable and transparent to manage their cities efficiently[125]. This requires that cities collect data that facilitates evidence-based decision-making and verification that "no one is left behind."[126] It is crucial for countries to utilize a global monitoring framework to assess how countries and cities are progressing in the implementation of the New Urban Agenda and achievement of SDG targets. The voluntary monitoring will ensure continuous monitoring of the implementation of NUA and Urban SDGs.

Methodology

Computation Method:

$$Percentage\ of\ cities\ with\ capacity\ to\ monitor\ the\ implementation\ of\ their\ urban\ development\ policies = 100\ X\ [\frac{\text{Number of cities with capacity to monitor implementation their urban policies}}{\text{Total number of cities in country}}]$$

One way to determine whether a city has capacity to monitor is if it can produce the indicators in this NUA Monitoring Framework. Alternatively, if it is regularly producing its city voluntary report utilizing indicators listed in this framework or an assessment tool utilized in their country.

Disaggregation:

Data to be provided at city level.

Data Sources

The Ministry selected by the government as the focal point for this indicator.

Collection process:

At the Global level, National focal points should send data to UNHABITAT-GUO, unhabitat-guo@un.org.

Calendar

The monitoring of the indicator can be every two years until the year 2036.

[125] UNHABITAT, "World Cities Report 2016", page 119.
[126] Ibid, page 193

Data providers

National Focal points will nominated by respective Governments.

Data compiler

UNHABITAT

References

1. UNHABITAT, “World Cities Report 2016”, page 119, http://wcr.unhabitat.org/main-report/
2. *Ibid*, page 193

78 Number of countries that have participated in capacity building workshops on New Urban Agenda indicators

Definition:

Countries will need to collect good and comparable data for monitoring implementation of the New Urban Agenda. One was for countries to acquire the capacity to collect this data on the indicators for monitoring implementation of the New Urban Agenda is by UNHABITAT, other agencies and partners to conduct capacity building workshops on collection of data on indicators for monitoring the New Urban Agenda. Hence the need for to count the number of countries that have participated in capacity building workshops on New Urban Agenda indicators.

Rationale:

Local governments face demand to collect data related to urban planning, governance, delivery of basic services. In addition, central and local government policymakers are increasingly making evidence-based decisions. Local governments implement sustainable urban plans that include disaster preparedness such as hazard-mapping. The New Urban Agenda (NUA) calls for support to all levels of governments in the collection, disaggregation, and analysis of data for monitoring implementation the New Urban Agenda (NUA §158 & §159). Member States agreed that data sources monitoring the implementation of NUA should be from official national, subnational and local government sources.

Methodology

The indicator counts countries that have participated in capacity building training workshops/meetings in collection of New Urban Agenda indicators.

Disaggregation:

Data to be provided at national level

Data Sources

UNHABITAT will go through participants lists of workshops conducted by UNHABITAT, other UN agencies and other partner institutions.

Calendar

The monitoring of the indicator will be every two years until the year 2036.

Data providers

UNHABITAT, other UN agencies and other partner institutions

Data compilers

UNHABITAT

References

UNHABITAT, “World Cities Report 2016”, page 43, http://wcr.unhabitat.org/main-report/
The New Urban Agenda, http://habitat3.org/wp-content/uploads/NUA-English.pdf

Contact and Additional Information

Name:	
Title:	
Email:	
Organization:	

Please select whichever applies:

☐ A group of government agencies responded to the questionnaire collectively.
☐ I am authorized and fully knowledgeable to respond to this questionnaire.

☐ I did not have the full information to respond to this questionnaire

☐ I mostly provided my own opinion/assessment rather than official information.

☐Other: *(Max. 250 words)*