



Geospatial Data Taxonomy for the Sustainable Development Goals in Africa

Strengthening the capacities
of selected African countries to
develop geospatial information
resources and services in support
of the implementation and
monitoring of the Sustainable
Development Goals



To order copies of *Geospatial Data Taxonomy for the Sustainable Development Goals in Africa Strengthening the capacities of selected African countries to develop geospatial information resources and services in support of the implementation and monitoring of the Sustainable Development Goals*, please contact:

Publications Section
Economic Commission for Africa
P.O. Box 3001
Addis Ababa, Ethiopia
Tel: +251 11 544-9900
Fax: +251 11 551-4416
E-mail: eca-info@un.org
Web: www.uneca.org

© 2021 Economic Commission for Africa
Addis Ababa, Ethiopia

All rights reserved
First printing November 2021

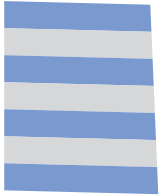
Material in this publication may be freely quoted or reprinted.
Acknowledgement is requested, together with a copy of the publication.

The designations employed in this report and the material presented in it do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Economic Commission for Africa concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Designed and printed in Addis Ababa, Ethiopia by the ECA Printing and Publishing Unit. ISO 14001:2015 certified.
Printed on chlorine free paper



United Nations
Economic Commission for Africa



Geospatial Data Taxonomy for the Sustainable Development Goals in Africa

Strengthening the capacities
of selected African countries to
develop geospatial information
resources and services in support
of the implementation and
monitoring of the Sustainable
Development Goals

TABLE OF CONTENTS

Acknowledgements	V
Executive summary.....	VI
I. Introduction	1
II. Method of determining geospatial information for the Sustainable Development Goals ..	2
III. Standards.....	4
IV. Metadata	6
V. Geospatial feature classes for Sustainable Development Goal indicators.....	7
VI. Geospatial data taxonomy.....	9
A. Fundamental geospatial data theme: Global Geodetic Reference Frame	10
C. Fundamental geospatial data theme: Addresses	14
D. Fundamental geospatial data theme: Buildings and Settlements	16
E. Fundamental geospatial data theme: Elevation and Depth	20
F. Fundamental geospatial data theme: Functional Areas.....	23
G. Fundamental geospatial data theme: Geographical Names	31
H. Fundamental geospatial data theme: Geology and Soils.....	32
I. Fundamental geospatial data theme: Land Cover and Land Use	35
J. Fundamental geospatial data theme: Land Parcels	37
K. Fundamental geospatial data theme: Orthoimagery	39
L. Fundamental geospatial data theme: Physical Infrastructure.....	40
M. Fundamental geospatial data theme: Population Distribution.....	53
N. Fundamental geospatial data theme: Transport Networks	54
N. Fundamental geospatial data theme: Water.....	66
VII. Conclusion	73
References	74
Annex 1	75
Agenda 2030 – sustainable development goals, targets and indicators	75
Annex 2	109
Geospatial information for SDG indicators (matrix)	109

NOTE BY THE SECRETARIAT

The secretariat has the honour to transmit to members of the Regional Committee of United Nations Global Geospatial Information Management for Africa the geospatial data taxonomy for the Sustainable Development Goals for Africa. The text of the taxonomy is set out in the annex to the present note.

ACKNOWLEDGEMENTS

The present document on Geospatial Data Taxonomy for the Sustainable Development Goals in Africa was prepared with the financial support of the 2030 Agenda for Sustainable Development Sub-Fund of the United Nations Peace and Development Trust Fund.

The initial background document was prepared by Derek G. Clarke, former Chief Director, National Geospatial Information, South Africa. It was finalized with the support of the Geospatial Information Management Section of the Economic Commission for Africa (ECA).



EXECUTIVE SUMMARY

The 2030 Agenda for Sustainable Development requires quality, accessible, timely and reliable disaggregated data for measuring, monitoring and reporting on the 17 Sustainable Development Goals. Geospatial information was identified as an important data set for them and this study assessed the need for such information. The assessment was conducted at the level of the indicators of the Sustainable Development Goals and found that 126 (51.4%) of the indicators require geospatial information, and that some such information is required for all 17 Goals.

The geospatial information has been organized into geospatial feature classes using the global fundamental geospatial data themes. For semantic reasons it is important to provide a geospatial data taxonomy for these geospatial feature classes. The geospatial data taxonomy describes the geospatial feature class, its logical data model, the collection and maintenance of the features and their use in the indicators of the Sustainable Development Goals.

The geospatial information must comply with the relevant standards. To make the geospatial information discoverable and to provide information on its fitness for use, including any access restriction, the geospatial information must have complete metadata, preferably at least at the level of the data sets.

This study furthers the work of the African Action Plan on Geospatial Information for Sustainable Development.

I. INTRODUCTION

The 2030 Agenda for Sustainable Development, with its 17 Sustainable Development Goals, requires each Member State to regularly monitor and report on progress towards the achievement of the Sustainable Development Goal targets. Such monitoring and reporting requires information that is relevant for the purpose. Furthermore, it is intended that the 2030 Agenda should learn the lessons of the Millennium Development Goals, which were generally not achieved. One of the important lessons of the Millennium Development Goals is that they failed to give adequate attention to the use of relevant information, making it difficult to accurately measure progress in achieving the targets.

Paragraph 48 of the resolution on the 2030 Agenda states that “quality, accessible, timely and reliable disaggregated data will be needed to help with the measurement of progress and to ensure that no one is left behind”. Taking this further, paragraph 76 of the same resolution undertakes to support African countries, among others, to strengthen “the capacity of national statistical offices and data systems to ensure access to high-quality, timely, reliable and disaggregated data”. Paragraph 76 also refers specifically to the use of geospatial information, emphasizing the national ownership of such information.

Before the adoption of the 2030 Agenda, Africa set its own development agenda in Agenda 2063 – The Africa We Want. While this African development agenda has its own goals, the seven Aspirations, they seek broadly the same result as the Sustainable Development Goals, so the achievement of the latter will also serve to achieve the African Aspirations. In particular, relevant information, including geospatial information, will serve the purpose of both development agendas.

Because Africa does not have adequate access to “high-quality, timely, reliable and disaggregated data”, including geospatial information, the Regional Committee of United Nations Global Geospatial Information Management for Africa (UN-GGIM: Africa) has approved the African Action Plan on Geospatial Information for Sustainable Development, 2016-2030. The vision of the Action Plan is “Advancing Africa’s sustainable development agenda through sound geospatial information management” and its mission statement is “Africa produces and uses authoritative and evidence-based geospatial information for the attainment of its Sustainable Development Goals and Agenda 2063 objectives”. In this context the Action Plan defines “authoritative and evidence-based geospatial information as referring to “rigorously controlled, best quality and ‘official’ – consensus-based – geospatial information, which provides an objective, logically-led and uncertainty-free source of decision-making.”

Geospatial information can be used directly in the measurement and monitoring of and reporting on the Sustainable Development Goals, to provide the location of statistical or other information, and to provide verification of statistical and other information.



II. METHOD OF DETERMINING GEOSPATIAL INFORMATION FOR THE SUSTAINABLE DEVELOPMENT GOALS

In order to determine the geospatial information required for measuring, monitoring and reporting on the Sustainable Development Goals, the following method was used:

- (a). The goals and targets were listed;
- (b). For each target, the indicators, as determined by the Inter-Agency and Expert Group on Sustainable Development Goal Indicators in 2016, were listed;
- (c). For each indicator, the definition of the indicator, as prepared by the United Nations Statistics Division, was listed. It should be noted that, at the time the Sustainable Development Goal e-Handbook was accessed, some of the indicators had no definition. In principle, for each indicator, the e-Handbook provides the definition and rationale, data sources and collection method, method of computation and other methodological considerations, and data disaggregation (see annex 1);
- (d). An assessment was made on the basis of the definition of the indicator to list all the geospatial information required for each indicator. This was further analysed, using the content of the given data sources, method of computation and data disaggregation, to refine the identification of the geospatial information or to add to the requirements;
- (e). At the time the Sustainable Development Goal e-Handbook was accessed (25–26 October 2019), not all the indicators had a definition (see annex 1). In such cases, the wording of the Sustainable Development Goal target and indicator were used to assess the geospatial information required for that indicator;
- (f). At the same time as assessing the required geospatial information for each indicator, any specific requirements or conditions which would qualify the geographical coverage or type of geospatial information required were noted;
- (g). This provided the list of geospatial information required for each of the indicators;
- (h). This list was then tested against the list of applicable Sustainable Development Goals for each of the global fundamental geospatial data themes of UN-GGIM. It was noted, however, that these were given only at the Goal level and not for each indicator.

The final list of geospatial information required for each Sustainable Development Goal indicator may be found in annex 2.

It must be noted that some indicators are repeated against different Sustainable Development Goal targets and as such would have the same geospatial information. These repeated indicators are:

- 4.7.1/12.8.1
- 8.4.1/12.2.1
- 8.4.2/12.2.2
- 10.3.1/16.b.1
- 10.6.1/16.8.1
- 15.7.1/15.c.1
- 15.a.1/15.b.1
- 1.5.1/11.5.1/13.1.1
- 1.5.3/11.b.1/13.1.2
- 1.5.4/11.b.2/13.1.3

Of the 245 indicators, 126 (51.4%) require geospatial information, but the geospatial information required covers all 17 Sustainable Development Goals.



III. STANDARDS

Geospatial information that is available, accessible and usable should comply with defined standards. Open standards enhance the accessibility and usability of geospatial information. Standards used in the collection and capture of geospatial information enhance knowledge of data quality and ensure that such data meets the quality requirements set for the data. Compliance with the applicable standards significantly reduces time and effort in the integration or fusion of disparate data sets. This is a critical requirement when working with big data. Although implementation and compliance with standards may be considered complicated and time-consuming, there are real advantages in using the relevant standards.

Some standards are foundational and apply to all geospatial information; and relevant foundational standards are given below. Some standards are specific to a particular feature class or group of feature classes; these are given in section VI below against the particular feature class.

Standards are usually generic to make them applicable to a wide range of applications. To make the standard more applicable to a particular application, and less complicated, a profile for that standard can be used.

Foundational standards – of the International Organization for Standardization (ISO) that apply – for geospatial information are:

(a). ISO 19101-1:2014, Geographic information – Reference model – Part 1: Fundamentals

ISO 19101 defines a reference model of the requirements for standardization and the fundamental principles that apply in developing and using standards for geographic information;

(b). ISO 19157:2013, Geographic information – Data quality

This standard specifies the description, evaluation and reporting of the quality of geographic data;

(c). ISO/TS 19158:2012, Geographic information – Quality assurance of data supply (this is a technical specification)

The standard provides a quality assurance framework for the producer and customer in their production relationship. Methods for managing the quality of production are identified;

(d). ISO 19110:2005, Geographic information – Methodology for feature cataloguing

This standard does not define a feature catalogue (or feature classification system, as many would understand it), but specifies the methodology for cataloguing feature types (or feature classes, as many would understand it) to compile a feature catalogue. However, it does not specify how to decide what the feature types should be (their collection criteria);

(e). ISO 19123:2005, Geographic information – Schema for coverage geometry and functions

This standard provides the conceptual schema for the spatial aspects of coverages, which includes all forms of imagery, gridded and raster data, such as remote sensing, photogrammetry, image processing, digital elevation and terrain models, and modelling using discrete surfaces (polygons with homogenous values) or continuous surfaces;

(f). ISO 19107:2019, Geographic information – Spatial schema

This standard provides conceptual schemas for describing and manipulating spatial characteristics of geographic features. The associated set of operators is also described;

(g). ISO 19106:2004, Geographic information – Profiles

This standard provides guidelines on how to develop a profile of an ISO Technical Committee (ISO/TC) 211 standard. The standard specifies two types of profiles that can be developed: the first is a subset of the standard; the second is an extension of the standard for a specific application field;

(h). ISO 19115-1:2014, Geographic information – Metadata – Part 1: Fundamentals

The standard specifies how to document metadata, which includes information on data quality, lineage, etc.;

(i). ISO/TS 19115-3:2016, Geographic information – Metadata – Part 3: XML implementation of fundamentals (this is a technical specification)

XML implementation of ISO 19115-1, Geographic information – Metadata – Part 1: Fundamentals;

(j). ISO 19115-2:2019, Geographic information – Metadata – Part 2: Extensions for imagery and gridded data

The standard specifies how to document metadata for imagery and gridded data, which includes information on data quality, lineage, etc.



IV. METADATA

Metadata are often neglected or avoided, but they should be regarded as an essential component in the collection, dissemination and use of geospatial information. The negative view of metadata is largely a function of the time and effort required to collect and maintain the metadata of the geospatial information. Yet the benefits of having good metadata outweigh the time and effort required.

Metadata provide valuable information for the discovery of available geospatial information. The lack of knowledge of what geospatial information is available and its source is a major cause of the lack of effective use of geospatial information. Metadata also provide details of the quality of the information, which determines its fitness for use. The metadata also informs the user of any conditions that may be attached to the use of the information, such as copyright.

Metadata for all the geospatial information for the Sustainable Development Goals should be made compulsory.

The metadata may be given at different levels of detail. The following levels can be considered:

- (a). **Whole database (the most aggregated level);**
- (b). **Data set;**
- (c). **Feature class;**
- (d). **Feature (the most detailed level).**

Implementation of the metadata may be effected in stages, starting at the database level (least detailed). It is recommended that the metadata be collected at least at the data set level.

The metadata should comply with the ISO standards for metadata to ensure that the metadata can be accessed and used across different information systems without effort. Failure to do so can result in geospatial information not being discovered or effectively used.

V. GEOSPATIAL FEATURE CLASSES FOR SUSTAINABLE DEVELOPMENT GOAL INDICATORS

The geospatial information required for the collection and monitoring of and reporting on the Sustainable Development Goal indicators have been determined as described in section 2 above (see also annex 2). The geospatial information has been classified into geospatial feature classes based on the global fundamental geospatial data themes as determined by UN-GGIM (E/C.20/2018/7/Add.1) and the ISO standard 19110:2016, Geographic information – Methodology for feature cataloguing. The classification is organized hierarchically. This classification has only two levels of feature classes, grouped within a global geospatial data theme. The two levels are deemed necessary to adequately provide the level of detail of geospatial information for use in the Sustainable Development Goal indicators.

The feature classification is given below. It must be noted that this is not a complete list of geospatial feature classes, but only those required for the Sustainable Development Goal indicators.

Table 5.1 Geospatial feature classification for Sustainable Development Goal indicators

Data theme*	Feature Class – Level I	Feature Class – Level II	Key Attributes
A. Global Geodetic Reference Framework	Geodetic Control Network	Geodetic Control Station	Ref. No., Type, Description
B. Addresses	Address	-	Type, Value
C. Buildings and Settlements	Building	-	Type
	Settlement	-	Name, Class
D. Elevation and Depth	Elevation	Digital Elevation Model	Post spacing
	Depth	Digital Bathymetric Model	Post spacing
E. Functional Areas	Administrative Area	Country	Name, Status
		Second-level Administrative Area	Name
		Third-level Administrative Area	Name
		Government Functional Administration	Class, Name
		Exclusive Economic Zone (marine)	Name
	Conservation Area	-	Class, Name
	Statistical Area	-	Class, Name
F. Geographical Names	Geographical Name	-	Class, Name
G. Geology and Soils	Geology	Aquifer	Type, Volume
	Soil Unit	-	Class
H. Land Cover and Land Use	Land Cover Unit	-	Class
	Land Use Unit	-	Class
I. Land Parcels	Cadastral Land Parcel	-	Parcel ID, Land tenure type



Data theme*	Feature Class – Level I	Feature Class – Level II	Key Attributes
J. Orthoimagery	Orthoimage	-	Sensor platform, Spatial resolution, Spectral bands, Radiometric resolution, Image date
K. Physical Infrastructure	Structure	Bridge	Type, Span, Bearing weight
		Tunnel	Name
		Aqueduct	
		Canal	
		Dam	Type
	Public Utility	Telecommunications Tower	Type
		Electrical Power Generation	Type
		Waste Disposal Site	
		Sewerage Treatment	
		Water Reticulation Point	
Public Service	School	Type, Name	
	Health Facility	Type, Name, Health services	
L. Population Distribution	Population	-	
	Population Density	-	
M. Transport Networks	Road Network	Road	Class, route number/name, Surface type
		Street	Surface type, Name
	Rail Network	Railway	Class, Gauge
		Station	Name
	Water	Harbour	Class, Name, Capacity
		Ferry Crossing	Transport type
	Air	Airport or Aerodrome	Class, Name, Facilities
Public Transport Route	-		
N. Water	Inland Water	River	Class, Name
		River Basin	Name
		Lake	Class, Name
		Wetland	Type
	Reservoir	Class	
	Marine	Ocean or Sea	Name
Coastline			

*Global Geospatial Data Themes



VI. GEOSPATIAL DATA TAXONOMY

The geospatial data taxonomy provides a better understanding of geospatial information. This is particularly important for a multidisciplinary environment such as the Sustainable Development Goal environment. The data taxonomy addresses the semantic understanding of the geospatial features. It provides a description of the feature class, the geospatial attributes (geometry and topology), descriptive attributes, and the collection and maintenance of the features.

Being a hierarchical classification, the rule of inheritance is applied for the descriptive attributes. This means that descriptive attributes of the “parent” are inherited by the “child” (next level of class in the hierarchy). Inheritance means that the attribute is not repeated in the data taxonomy of the “child” feature, but does apply.

The following geometry types are used:

- Point
- Line (sometimes called an arc, or polyline)
- Area (sometimes called a polygon or face) – an area has a boundary
- Grid
- Raster (cells)
- Triangulated Irregular Network (TIN)

In some applications of low resolution (detail), a line or an area can be represented by a point. In some applications, a grid and raster may be used by representation of cells.

Many applications require the geospatial information to be topologically structured. For this reason, it is given that the geospatial information must be topologically structured. The topology included is:

- Node
- Coincidence (or shared line segment)
- Intersection
- Adjacency
- Containment (or “island”)

A point is represented by a node. All lines or line segments must start and end with a node. The order of the nodes and direction of the line must be consistent when used in a network or for a route (continuity). Adjacent areas must share a boundary or boundary segment (line) – coincidence.



The data taxonomy of the geospatial feature classes given below is taken from the list of geospatial feature classes given in table 5.1. It only includes the geospatial feature classes, with the level of resolution, and descriptive attributes required for the Sustainable Development Goal indicators. It does not provide a complete geospatial data taxonomy for all geospatial feature classes or all descriptive attributes for a geospatial feature class.

In addition to the geospatial features classes listed in table 5.1, various indicators only require geospatial information in a particular geographic area (coverage), such as Soil Unit in forest areas only, or for specific value(s) of a descriptive attribute of a geospatial feature class, such as Land Use Unit: Class = agriculture, or Settlement: Class = city. These are referred to as “qualifiers for specific indicator” in the data taxonomy below.

Where applicable, these qualifiers are also given in annex 2 against the Sustainable Development Goal indicator.

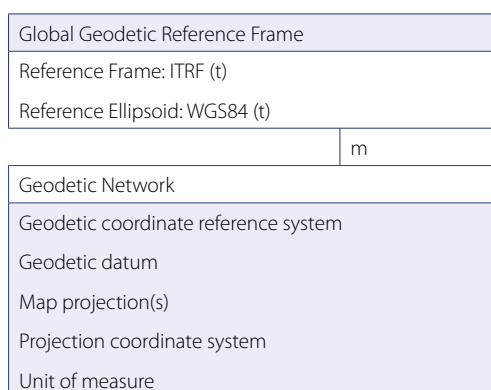
A. Fundamental geospatial data theme: Global Geodetic Reference Frame

THEME DESCRIPTION:

The Global Geodetic Reference Frame is the framework which allows users to precisely determine and express locations on the Earth, and to quantify changes of the Earth in space and time. It is not a data theme in the sense of the other themes, but it is a prerequisite for the accurate collection, integration, and use of all other geospatial data.

A.1. Feature class: Geodetic Network

(a). Logical data model



t= temporal realisation

(b). Description of feature class

A network of geodetic control stations (monuments) defining the geodetic reference frame for the region covered, usually a regional or national geodetic network. This provides for the unique spatial referencing of all geospatial information. All location information requires the geodetic network.

For the Africa region, the African Reference Frame (AFREF) is being established. This will provide for a realization of the International Terrestrial Reference System (ITRS) over the Africa region, and from this the national geodetic network can be established.

(c). Description of attributes

(i). Geodetic coordinate reference system

This is a system for uniquely referencing a position in space by coordinates in relation to a reference ellipsoid, reference frame and datum.

The coordinate system may be expressed as a three-dimensional Cartesian coordinate system (X,Y,Z) in which the origin is at the Earth's centre, the Z-axis coincides with the mean rotational axis of the Earth, the mean equatorial plane is perpendicular to the Z-axis and forms the XY-plane, the mean meridian plane of Greenwich generates the XZ plane, and the Y-axis is directed to obtain a right-handed coordinate system.

It may alternatively be expressed as a geographical coordinate system, where the position of a point on the Earth's surface is described in terms of geodetic latitude (φ), longitude (λ) and ellipsoidal height (h), where the angle made by the intersection of the normal to the ellipsoid, passing through the point on the Earth's surface, with the equatorial plane is the geodetic latitude (measured positive northwards from the Equator), the angle between the prime meridian (zero longitude – Greenwich) plane and the meridian plane containing the normal to the point on the Earth's surface is the geodetic longitude (measured positive eastwards), and the ellipsoidal height is the distance measured perpendicular to the ellipsoid at the point on the Earth's surface. The geographical coordinates may exclude the height, giving only the latitude and longitude of the point.

(ii). Geodetic datum

This is the set of parameters (origin, scale, orientation) that describes the relationship of the geodetic coordinate system to the Earth.

In the case of two-dimensions (horizontal), it is often referred to as the "zero point" of the geodetic coordinate system.

In the case of the third dimension (vertical), for heights other than ellipsoidal heights it is defined by a reference surface, such as mean sea level (MSL), determined by a reference tide gauge, to provide orthometric heights (elevation) – normal to the geoid, or for marine areas by lowest astronomical tide (LAT), from which depths are measured.

(iii). Map projection(s)

Map projection describes the case where the reference ellipsoid is projected on to a reference surface, mainly a plane or cylinder or cone, that can be flattened to a plane surface, providing a one-to-one mathematical relationship between the two based on the same datum. The map projection provides for simplification in calculations and representation. However, the properties of the ellipsoid are distorted, with the map projection preserving only certain properties. This



provides for a classification of map projections as conformal, equal area, azimuthal or equidistant. A scale factor may be applied to reduce the effect of the distortions – this provides for a “secant” case of the map projection. The projected lines of latitude and longitude are called the graticule. The most appropriate map projection must be selected for the particular application and taking the magnitude of the distortions into account. More than one map projection can be used in a country or region.

Commonly used map projections for the African region are:

- Transverse Mercator
- Universal Transverse Mercator (UTM)
- Lambert’s Conic Conform Projection with Two Standard Parallels
- Albers Equal-Area.

(iv). Projected coordinate system

A plane Cartesian coordinate system based on the map projection, with a given set of parameters. The parameters give the origin of the coordinate system, the order and orientation of the axes, and the convention for direction measurement (zero axis and rotation). Usually a right-handed coordinate system is used. An offset to the coordinate origin may be used, such as in the UTM Coordinate System.

The projected coordinate system is specific to the map projection used.

(v). Unit of measure

The unit of measure must be specified. The International System of Units (SI), commonly called the metric system, is the most commonly used system. The unit for length is the metre. National standards define the units of measure in a country.

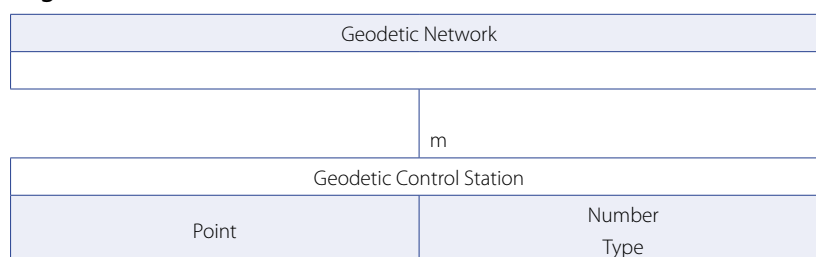
(d). Applicable standards

ISO 19111: 2019 Geographic information – Spatial referencing by coordinates

IHO S44 Standards for Hydrographic Surveys

A.2. Feature class: Geodetic Control Station

(a). Logical data model



(b). Description of feature class

A permanent monumented station within the national geodetic network with accurate coordinates. It is used as a control station in the determination of the position of other geographical phenomena (features). These stations represent the national realization of the geodetic reference frame, and are based on the national geodetic datum. The monument may take on different constructions, from a concrete pillar with a signal, to a signal on a building, to a stud set in concrete at or near ground level.

(c). Description of attributes

Geometry and topology: Point.

Descriptive:

Number: A unique identifier of the station.

Type: Describes the type of station.

Values: Beacon – passive station.

CORS – continuously operating GNSS base station.

Benchmark – station in the heighting (levelling) network with accurate elevation.

(d). Collection and maintenance of features

(i). Source

Geodetic Control Station is part of the national geodetic network. Records from the authority responsible for geodetic surveys.

(ii). Resolution

Coordinates are determined in accordance with national geodetic standards. Horizontal positions can be accurate to $\pm 0.05\text{m}$ at 95% confidence level.

(iii). Temporal aspects

Movement of position can occur with the movement of the tectonic plate and polar motion. Should all the stations be located on the same tectonic plate then there is consistent movement of the whole network of stations. It may be necessary to change the coordinates of the station due to this movement over time depending on the amount of movement. The International Terrestrial Reference Frame (ITRF) is recomputed from time to time, providing an updated realization of the ITRS.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Used in all the Sustainable Development Goal indicators where geospatial information is required.

(f). Link to other data for reporting on the Sustainable Development Goals

The basis for all geospatial positions and location information.



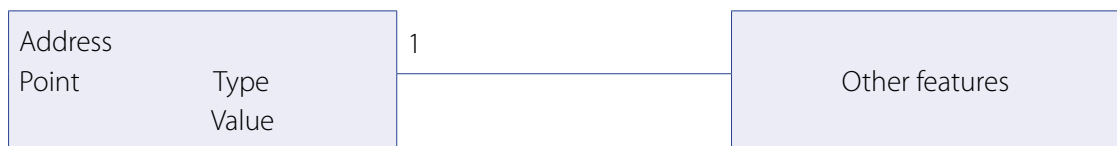
B. Fundamental geospatial data theme: Addresses

THEME DESCRIPTION:

An “Address” is a structured label, usually containing a property number, a street name and a locality name. It is used to identify a plot of land, a building or part of a building, or some other construction, together with coordinates indicating their geographic position. Addresses are often used as a proxy for other data themes such as Land Parcels.

B.1. Feature class: Address

(a). Logical data model



(b). Description of feature class

An “Address” is used as a humanly readable identification of a phenomenon at a specific location, such as a house, an apartment or an office; as such, it is always associated with another feature. In some instances, it is used as a descriptive attribute of the feature. It can be used as a proxy for a location. An address must be unambiguous to avoid confusion with another location. To minimize the possibility of ambiguity, an address may consist of a hierarchy of component information, in particular administrative areas.

(c). Description of attributes

Geometry and topology: Point

Descriptive:

Type: The type of address that is given. The address must be given in a standardized format.

Value: Postal

Street

Informal

Farm

Intersection

Section of a building

(d). Collection and maintenance of features

(i). Source

Records of the address authorities, such as postal service agency or local municipality.

(ii). *Resolution*

The position of an address must be accurate enough to avoid any confusion in the location of the phenomenon it refers to. The coordinate should be at the building entrance.

(iii). *Temporal aspects:*

An address is related to a specific phenomenon, which may change over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Address is required as an identifier for Building (Dwelling) only. This includes addresses in formal urban, informal urban and rural areas.

Qualifiers of specific indicator:

“Rural” indicates address required for dwelling in rural areas only.

“Urban” indicates address required for dwelling in urban areas only.

(f). Link to other data for reporting on the Sustainable Development Goals

An address can be used to link different data, which may not be geospatial data.

(g). Applicable standards

ISO 19160-1: 2015 Geographic information – Addressing Part 1: Conceptual model.



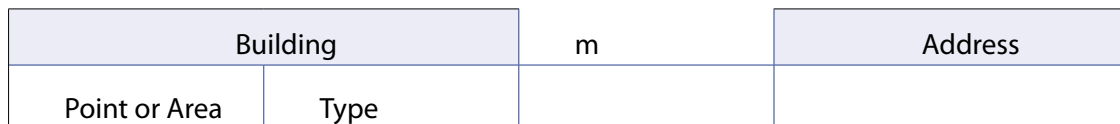
C. Fundamental geospatial data theme: Buildings and Settlements

THEME DESCRIPTION:

“Building” refers to any roofed structure permanently constructed or erected on its site, for the protection of humans, animals or things, or for the production of economic goods. A “Settlement” is a collection of buildings and associated features where a community carries out socioeconomic activities.

C.1. Feature class: Building

(a). Logical data model



(b). Description of feature class

“Building” refers to any roofed structure permanently constructed or erected on its site, for the protection of humans, animals or things, or for the production of economic goods. A building may be a single or multi-floored structure. It may be constructed from different materials.

(c). Description of attributes

Geometry and topology: Point – for a small building or at a generalized level – coordinate is at centroid of building.

Area – for a large building or at high resolution level, the outline of the building is represented.

Descriptive:

Type – the type of building.

Value – Dwelling (house)

Dwelling (informal)

Dwelling (apartment)

Storage facility

Commercial bank

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage.

(ii). Resolution

The position of the building must be accurate enough to avoid any confusion in the location. The resolution must provide for correct topological relationship to other features. Where an address is given for the building there must be no conflict in the location.

(iii). *Temporal aspects*

Buildings can be erected in a short space of time and demolished.

(d). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

1.1.1; 1.2.1; 1.2.2; 1.3.1; 1.4.1; 1.4.2; 1.5.1; 1.5.2; 2.1.1; 2.1.2; 2.3.2; 2.5.1; 3.1.1; 3.2.1; 3.2.2; 3.3.1; 3.3.2; 3.3.3; 3.3.4; 3.3.5; 3.4.1; 3.4.2; 3.5.2; 3.7.1; 3.7.2; 3.8.1; 3.8.2; 3.9.2; 3.b.1; 3.c.1; 4.1.1; 4.2.1; 4.2.2; 4.3.1; 4.4.1; 4.6.1; 5.3.1; 5.4.1; 5.a.1; 6.1.1; 6.2.1; 8.4.2; 8.5.1; 8.5.2; 8.6.1; 8.7.1; 8.9.1; 8.10.1; 9.1.1; 10.1.1; 10.2.1; 11.1.1; 11.2.1; 11.5.1; 11.5.2; 12.2.2; 13.1.1; 17.8.1.

Qualifiers of specific indicators:

Required types of building are "Dwelling (House)", "Dwelling (Apartment)", "Dwelling (Informal)", "storage facility", "commercial bank", "automated teller machine".

"Rural" indicates required for dwelling in rural areas only.

"Urban" indicates required for dwelling in urban areas only.

"Inadequate housing" indicates dwelling deemed to be inadequate for housing.

(e). Link to other data for reporting on the Sustainable Development Goals

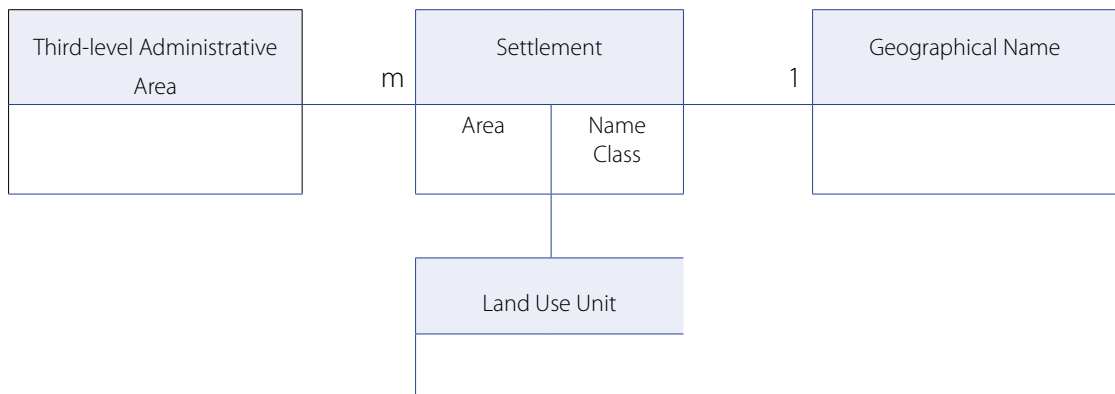
Link to Address.

Building (Dwelling) is used as the key location for the collection of population census data.



C.2. Feature class: Settlement

(a). Logical data model



(b). Description of feature class

A "Settlement" is a collection of buildings in close proximity to each other and associated features where a community carries out socioeconomic activities, including commercial, industrial, educational and recreational activities – various land use units. A settlement may also be called a village, town or city. A settlement may differ in extent from that of a local government/municipality area (area of jurisdiction).

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Name – name of the settlement.

Class – class of the settlement.

Value: Village

Town

Large town

City

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage or town mapping.

(ii). Resolution

The boundary of the settlement must be depicted appropriately for the application, removing any ambiguity as to any other features, such as buildings, that are within or not within a settlement.

(iii). Temporal aspects

The extent of the settlement can change rapidly with the erection of buildings on the periphery or in-filling of open spaces.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

1.1.1; 3.1.1; 3.2.1; 3.2.2; 3.3.1; 3.3.2; 3.3.3; 3.3.4; 3.3.5; 3.4.1; 3.4.2; 3.5.2; 3.7.1; 3.7.2; 3.8.1; 3.8.2; 3.9.2; 4.c.1; 5.4.1; 5.a.1; 5.b.1; 6.1.1; 6.2.1; 6.3.1; 6.b.1; 7.1.2; 8.4.2; 8.5.1; 8.5.2; 8.6.1; 8.7.1; 8.9.2; 8.10.1; 8.10.2; 9.1.1; 9.3.2; 9.c.1; 10.3.1; 11.1.1; 11.2.1; 11.3.1; 11.5.2; 11.6.2; 11.7.1; 12.2.2; 16.1.1; 16.1.2; 16.1.3; 16.1.4; 16.2.1; 16.2.2; 16.2.3; 16.3.1; 16.6.2; 16.7.2; 16.9.1; 16.b.1; 17.6.2; 17.8.1.

Qualifiers of specific indicators:

“City” indicates relevant for settlement class of “city” only.

“Slum” and “informal” indicate that part of a settlement is regarded as a slum or informal settlement.

(f). Link to other data for reporting on the Sustainable Development Goals

Used as the main proxy for the urban/rural divide.

Third-level Administrative Area.

Geographical Name.

Land use unit – of public space (park, recreation ground), which is inclusive of the settlement.



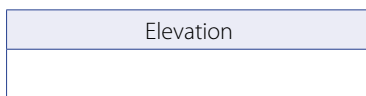
D. Fundamental geospatial data theme: Elevation and Depth

THEME DESCRIPTION:

The elevation and depth theme describes the surface of the Earth both on land and under a body of water, relative to a vertical datum.

D.1. Feature class: Elevation

(a). Logical data model

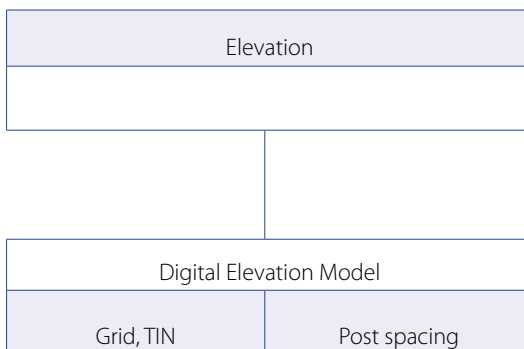


(b). Description of feature class

“Elevation” is the vertical distance (height) of a point or place above the vertical datum, usually mean sea level, given by the national geodetic reference frame.

D.2.1. Feature class: Digital Elevation Model

(a). Logical data model



(b). Description of feature class

The Digital Elevation Model (DEM) is a three-dimensional representation of the terrain surface (morphology) in digital form. When it excludes vegetation, buildings and other human-made features, it is called a Digital Terrain Model (DTM). When it includes the top of vegetation, buildings and other human-made features, it is called a Digital Surface Model (DSM). The DEM is usually given as a grid of postings, with the elevation given for each posting.

(c). Description of attributes

Geometry and topology: Grid or triangulated irregular network (TIN)

Descriptive:

Post spacing – the grid interval between posting (not for TIN)

(d). Collection and maintenance of features

(i). Source

Three-dimensional determination from point clouds obtained from 3-D image correlation computation or from a LiDAR survey. Alternatively, from digitization of contours on a map.

(ii). *Resolution*

The post spacing must be set at an interval to provide an adequate representation of the morphology of the terrain – recommended to be 5 metres. The accuracy of the elevation of the posting must meet application needs. The post spacing must be commensurate with the elevation accuracy. For the TIN, the apexes must be spaced to provide adequate representation.

(iii). *Temporal aspects*

Terrain is reasonably stable over time, with changes mainly due to human activities (earth-moving operations)

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

6.4.2; 6.5.2; 6.6.1; 9.c.1; 11.5.2; 11.6.2; 15.1.1; 15.2.1; 15.4.1; 15.4.2.

Qualifiers of specific indicators:

“Mountain” indicates required to determine “mountain areas”.

(f). Link to other data for reporting on the Sustainable Development Goals

Digital Elevation Models are used to determine watersheds and river basins.

Digital Elevation Models are used to determine mountainous areas.

Digital Elevation Models are used to determine low-lying areas that may be prone to flooding.

Contours can be interpolated from the Digital Elevation Model.

(g). Applicable standards

ISO/TR 19121:2000, Geographic information – Imagery and gridded data.

ISO 19129:2009, Geographic information – Imagery, gridded and coverage data framework.

D.2. Feature class: Depth

(a). Logical data model

Depth

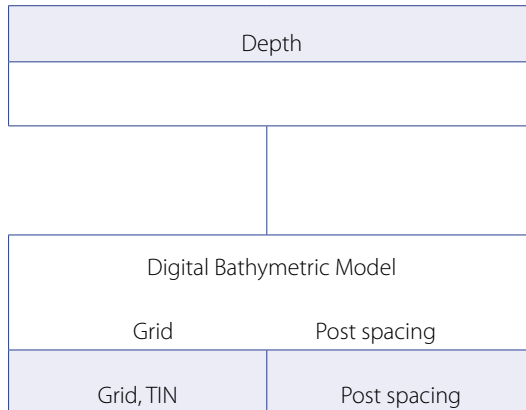
(b). Description of feature class

“Depth” is the vertical distance of a point, ocean or lake bottom below the vertical datum, usually the lowest astronomical tide (LAT) for marine areas.

The vertical distance between the vertical datum for elevations and the vertical datum for depth should be a defined relationship.

D.2.1. Feature class: Digital Bathymetric Model

(a). Logical data model



(b). Description of feature class

A three-dimensional representation of the bottom of a body of water, such as an ocean or lake, in digital form. The Digital Bathymetric Model (DBM), like the digital elevation model, is usually given as a grid of postings, with the depth given for each posting.

(c). Description of attributes

Geometry and topology: Grid

Descriptive:

Post spacing – the grid interval between posting.

(d). Collection and maintenance of features

(i). Source

Three-dimensional determination from point clouds obtained from sonar surveys.

(ii). Resolution

The post spacing must be set at an interval to provide an adequate representation of the morphology of the ocean/lake bottom. The accuracy of the depth of the posting must meet application needs, including safe navigation. The post spacing must be commensurate with the depth accuracy.

(iii). Temporal aspects

The digital bathymetric model is reasonably stable over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

14.1.1; 14.3.1; 14.4.1.

(f). Link to other data for reporting on the Sustainable Development Goals

The digital bathymetric model is used in the determination of marine boundaries and underwater features, such as reefs.

The digital bathymetric model is used in the management of marine ecosystems.

(g). **Applicable standards**

S-100, IHO Universal Hydrographic Data Model.

ISO/TR 19121:2000, Geographic information – Imagery and gridded data.

ISO/TS 19129:2009, Geographic information – Imagery, gridded and coverage data framework.

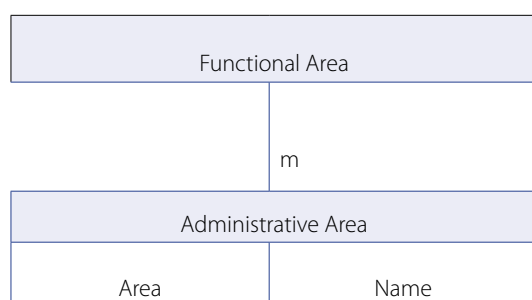
E. Fundamental geospatial data theme: Functional Areas

THEME DESCRIPTION:

“Functional Areas” are the geographical extent of administrative, legislative, regulatory, electoral, statistical, governance, service delivery and activity management areas.

E.1. Feature class: Administrative Area

(a). **Logical data model**



(b). **Description of feature class**

An Administrative Area defines an area of jurisdiction of an administrative authority to perform its function.

(c). **Description of attributes**

Geometry and topology: Area – consisting of bounding segments – boundaries (lines)

Descriptive:

Name – the official name of the administrative area.

(d). **Collection and maintenance of features**

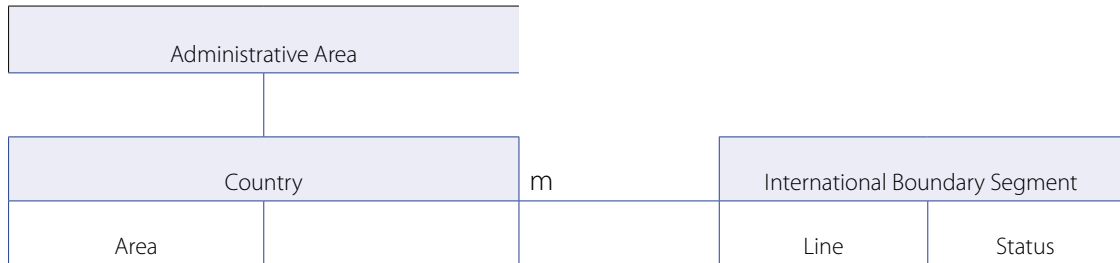
(i). *Source*

Records defining the administrative unit. Alternatively, by digitization of the boundaries from a map.



E.1.1.1. Feature class: Country

(a). Logical data model



(b). Description of feature class

“Country” is the sovereign region of a nation with its own government, and international recognition. The extent of a country is defined by its international boundary, given in segments to indicate shared boundaries with the neighbouring country/countries. For coastal countries it includes the maritime international boundary, as given by the United Nations Convention on the Law of the Sea.

(c). Description of attributes

Geometry: Area (for Country)

Line (for International Boundary Segment) – represented into segments bounded by nodes, with adjacency topology for adjacent country.

Descriptive:

Status (international boundary segment) – gives the status of the segment of the boundary.

Value: Agreed by treaty

Disputed

(d). Collection and maintenance of features

(i). Source

Records of the authoritative source for international boundaries. Alternatively, by digitization of the boundaries from a map.

(ii). Resolution

The boundary must be depicted with sufficient accuracy to remove any ambiguity as to its position that may result in conflict.

(iii). Temporal aspects

International Boundaries that are approved are stable.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

1.3.1; 1.5.1; 1.5.2; 2.1.2; 3.2.1; 3.2.2; 3.3.1; 3.3.2; 3.3.3; 3.3.4; 3.3.5; 3.4.1; 3.4.2; 3.5.2; 3.7.1; 3.7.2; 3.8.1; 4.1.1; 4.2.1; 4.2.2; 4.3.1; 4.4.1; 4.6.1; 4.a.1; 4.c.1; 5.2.1; 5.2.2; 5.3.2; 5.6.1; 6.b.1; 7.1.1; 7.1.2;

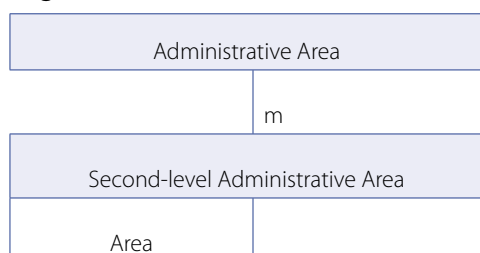
8.1.1; 8.2.1; 12.2.1; 12.2.2; 12.4.2; 12.5.1; 13.1.1; 15.2.1; 16.1.1; 16.1.2; 16.1.3; 16.1.4; 16.2.1; 16.2.2; 16.2.3; 16.3.1; 16.6.2; 16.7.2; 16.9.1; 16.b.1; 17.18.3; 17.19.1.

(f). Link to other data for reporting on the Sustainable Development Goals

Country is the main level for reporting on Sustainable Development Goal indicators.

E.1.2 Feature class: Second-level Administrative Area

(a). Logical data model



(b). Description of feature class

“Second-level Administrative Area” is the first division of administration in a country. It is based on the political system of the country. Second-level Administrative Areas are usually called province, state, or region.

(c). Description of attributes

Geometry and topology: Area – with boundary given in segments based on the adjacent second-level administrative area, and for coincidence with the international boundary segment where coincident.

(d). Collection and maintenance of features

(i). Source

Records of the authority responsible for delimitation of administrative areas. Alternatively, by digitization of the boundaries from a map.

(ii). Resolution

The boundaries must be depicted with sufficient accuracy to remove any ambiguity as to its position.

(iii). Temporal aspects

The boundaries of these areas can change by administrative decision.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

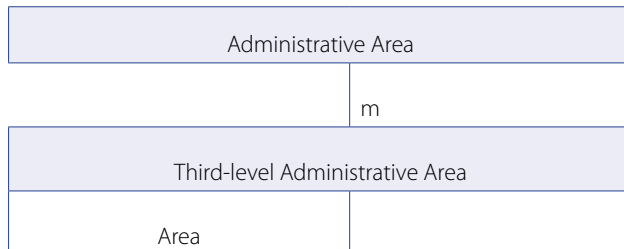
Indicators:

1.3.1; 1.5.1; 1.5.2; 2.1.2; 3.2.1; 3.2.2; 3.3.1; 3.3.2; 3.3.3; 3.3.4; 3.3.5; 3.4.1; 3.4.2; 3.5.2; 3.7.1; 3.7.2; 3.8.1; 4.1.1; 4.2.1; 4.2.2; 4.3.1; 4.4.1; 4.6.1; 4.a.1; 4.c.1; 5.2.1; 5.2.2; 5.3.2; 5.6.1; 6.b.1; 7.1.1; 7.1.2; 8.1.1; 8.2.1; 8.4.1; 8.4.2; 8.5.1; 8.5.2; 8.6.1; 8.7.1; 8.10.2; 10.3.1; 10.a.1; 11.4.1; 11.5.1; 11.5.2; 12.2.1; 12.2.2; 12.4.2; 12.5.1; 13.1.1; 15.2.1; 16.1.1; 16.1.2; 16.1.3; 16.1.4; 16.2.1; 16.2.2; 16.2.3; 16.3.1; 16.6.2; 16.7.2; 16.9.1; 16.b.1; 17.18.3; 17.19.1.



(f). Link to other data for reporting on the Sustainable Development Goals

Used as a key level (subnational) of reporting on Sustainable Development Goal indicators.

E.1.3 Feature class: Third-level Administrative Area**(a). Logical data model****(b). Description of feature class**

“Third-level Administrative Area” is the first division of the Second-level Administrative Area. It is based on the political system of the country. The areas are usually called districts or metropolitan areas.

(c). Description of attributes

Geometry and topology: Area – with boundary given in segments based on the adjacent third-level administrative area, and for coincidence with second-level administrative area, where coincident.

(d). Collection and maintenance of features*(i). Source*

Records of the authority responsible for delimitation of administrative areas. Alternatively, by digitization of the boundaries from a map.

(ii). Resolution

The boundaries must be depicted with sufficient accuracy to remove any ambiguity as to its position.

(iii). Temporal aspects

The boundaries of these areas can change by administrative decision.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)**Indicators:**

1.3.1; 1.5.1; 1.5.2; 2.1.2; 3.2.1; 3.2.2; 3.3.1; 3.3.2; 3.3.3; 3.3.4; 3.3.5; 3.4.1; 3.4.2; 3.5.2; 3.7.1; 3.7.2; 3.8.1; 3.b.1; 3.b.2; 3.c.1; 4.1.1; 4.2.1; 4.2.2; 4.3.1; 4.4.1; 4.6.1; 4.a.1; 4.c.1; 5.2.1; 5.2.2; 5.3.2; 5.6.1; 6.b.1; 7.1.1; 7.1.2; 10.3.1; 10.a.1; 11.4.1; 11.5.1; 11.5.2; 11.6.1; 11.7.1; 11.a.1; 12.4.2; 12.5.1; 13.1.1; 15.2.1; 16.1.1; 16.1.2; 16.1.3; 16.1.4; 16.2.1; 16.2.2; 16.2.3; 16.3.1; 16.6.2; 16.7.2; 16.9.1; 16.b.1; 17.18.3; 17.19.1.

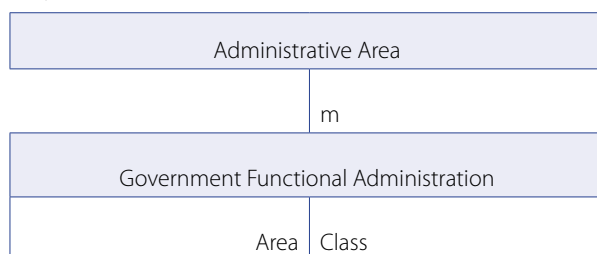
(f). Link to other data for reporting on the Sustainable Development Goals

Required for subnational (third-level) reporting level.

Required to indicate local government jurisdiction (municipality).

E.1.4 Feature class: Government Functional Administration

(a). Logical data model



(b). Description of feature class

“Government Functional Administration” is the area or region where a particular government function is performed or service rendered, such as education district, police district, primary health district. It is possible that one government functional administration area provides more than one government service – for statistical reporting purposes this is the preferred arrangement for the purpose of making comparative analysis.

(c). Description of attributes

Geometry and topology: Area. Adjacent areas to have common boundary.

Descriptive:

Class – the type of government service – can be more than one.

(d). Collection and maintenance of features

(i). Source

Records of government administration authority. Alternatively, by digitization of the boundaries from a map.

(ii). Resolution

The boundaries must be depicted with sufficient accuracy to remove any ambiguity as to its position.

(iii). Temporal aspects

The boundaries of these areas can change by administrative decision.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

1.3.1; 1.5.1; 1.5.2; 2.5.1; 2.5.2; 3.1.1; 3.2.1; 3.2.2; 3.3.1; 3.3.2; 3.3.3; 3.3.4; 3.3.5; 3.4.1; 3.4.2; 3.5.2; 3.7.1; 3.7.2; 3.8.1; 3.9.2; 3.9.3; 3.b.1; 3.b.2; 3.c.1; 4.1.1; 4.2.1; 4.2.2; 4.3.1; 4.6.1; 4.a.1; 4.c.1; 5.2.1; 5.2.2; 5.3.1; 5.3.2; 6.b.1; 11.5.1; 13.1.1.

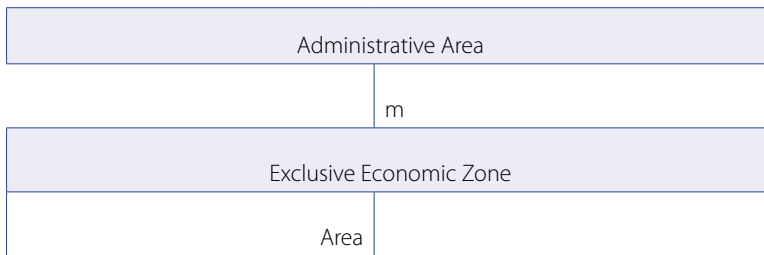
(f). Link to other data for reporting on the Sustainable Development Goals

Required for subnational reporting for functional domain.



E.1.5 Feature class: Exclusive Economic Zone (Marine)

(a). Logical data model



(b). Description of feature class

“Exclusive Economic Zone” is the marine area, beyond the territorial waters, assigned to the jurisdiction of a coastal country, wherein special rights of exploitation and use of the marine resources, including of the seabed, are given in terms of the United Nations Convention on the Law of the Sea. The area is a maximum of 200 nautical miles (approximately 360 km) from the baselines (low water) of the coastal country. There can be no overlapping of the Exclusive Economic Zone between coastal countries, and where such may occur then agreement must be reached between the respective countries on the position of the boundary of the Exclusive Economic Zone.

(c). Description of attributes

Geometry and topology: Area.

(d). Collection and maintenance of features

(i). Source

Records of the authority responsible for delimitation of the exclusive economic zone. Alternatively, by digitization of the boundaries from a map.

(ii). Resolution

The boundaries must be depicted with sufficient accuracy to remove any ambiguity as to its position.

(iii). Temporal aspects

The boundary is stable over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

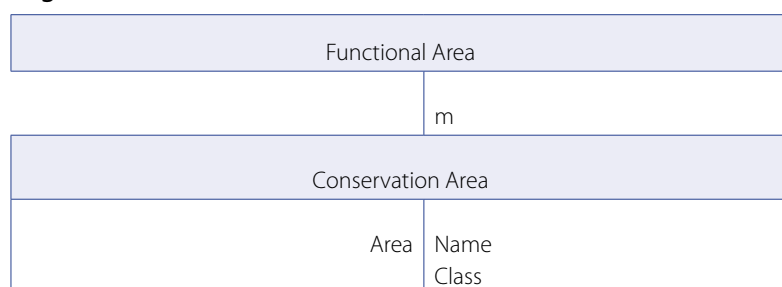
14.2.1; 14.4.1; 14.5.1; 14.7.1; 14.c.1.

(f). Link to other data for reporting on the Sustainable Development Goals

Provides the boundary for marine resources and the related marine environment – the blue economy.

E.2 Feature class: Conservation Area

(a). Logical data model



(b). Description of feature class

A “Conservation Area” is an area designated for the preservation and protection of heritage and historical features, flora and fauna. It may include marine areas.

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Name – identifying name of the conservation area.

Class – the class of features conserved

Value: Historical

Heritage

Flora

Fauna

Marine

(d). Collection and maintenance of features

(i). Source

Records of conservation authority. Alternatively, by digitization of the boundaries from a map.

(ii). Resolution

The boundaries must be depicted with sufficient accuracy to remove any ambiguity as to its position.

(iii). Temporal aspects

The area may change to include or exclude parts or all of the conservation area.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

14.5.1; 14.c.1; 15.1.2; 15.2.1; 15.4.1.

Qualifiers of specific indicators:

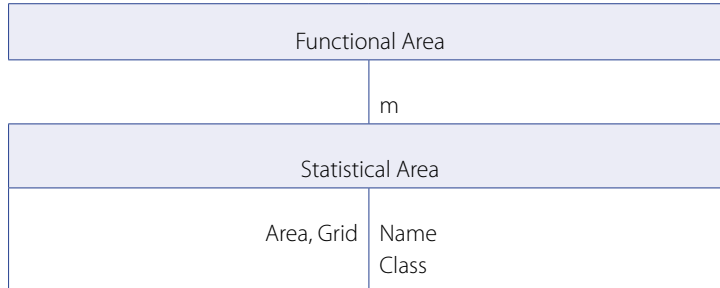
“Forest” indicates required for forest areas only.



(f). Link to other data for reporting on the Sustainable Development Goals

E.3 Feature class: Statistical Area

(a). Logical data model



(b). Description of feature class

A “Statistical Area” is a given area/grid cell for the purpose of collecting and reporting statistics on phenomena. A statistical area may coincide with an administrative area, but is generally given when statistics are reported for an area other than an administrative area. A statistical area may cover more than one administrative area.

(c). Description of attributes

Geometry and topology: Area or grid.

Descriptive:

Name – the name of the statistical area.

Class – the type of statistics reported.

Value: various

(d). Collection and maintenance of features

(i). *Source*

Records of government agency responsible for the reporting of statistics – usually the national statistics office. Alternatively, by digitization of the boundaries from a map.

(ii). *Resolution*

The boundaries must be depicted with sufficient accuracy to remove any ambiguity as to its position.

(iii). *Temporal aspects*

The boundaries of these areas can change by administrative decision.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

8.4.1; 8.4.2; 8.5.1; 8.5.2; 8.6.1; 8.7.1; 11.7.2; 12.2.1; 12.2.2; 16.1.1; 16.1.2; 16.1.3; 16.1.4; 16.2.1; 16.2.2; 16.2.3; 16.3.1; 16.6.2; 16.7.2; 16.9.1; 17.6.2; 17.8.1; 17.18.3; 17.19.1.

(f). Link to other data for reporting on the Sustainable Development Goals

Reporting on statistics in areas not otherwise provided for.

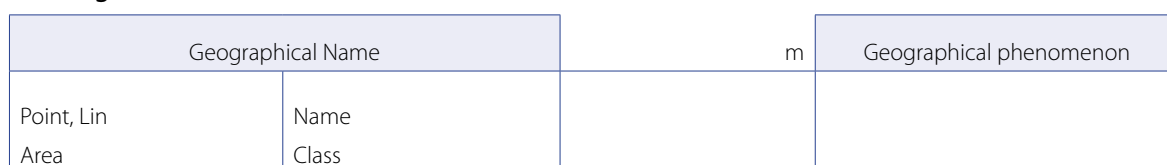
F. Fundamental geospatial data theme: Geographical Names

THEME DESCRIPTION:

Geographical Names give places orientation and identity. They are location identifiers for cultural and physical features of the real world, such as regions, settlements or any feature of public or historical interest. They are often used as a proxy for other data themes, such as Buildings and Settlements.

F.1 Feature class: Geographical Name

(a). Logical data model



(b). Description of feature class

“Geographical Name” is the name given to a geographical phenomenon. Its spelling is usually standardized by the national geographical names authority, although unapproved names may also be used. The same geographical name may be assigned to more than one geographical phenomenon. In multilingual countries, the name may be given in more than one language – an alternative name.

(c). Description of attributes

Geometry and topology: Point, line or area – depending on the geometry of the feature that the name is given to.

Descriptive:

Name – the geographical name.

Class – approval status of the name.

Value: Approved

Not approved

(d). Collection and maintenance of features

(i). Source

Records of the national geographical names authority. Alternatively, by digitization of the names from a map.

(ii). Resolution

The position of the name must be given with sufficient accuracy to remove any ambiguity as to the phenomenon it is assigned to.



(iii). Temporal aspects

Geographical names are stable over time but the name of a geographical phenomenon may be changed, for political or administrative reason.

(e). Use in Reporting of SDGs (indicators and qualifiers)

Required for name of settlement

Indicators:

1.1.1; 3.1.1; 3.2.1; 3.2.2; 3.3.1; 3.3.2; 3.3.3; 3.3.4; 3.3.5; 3.4.2; 3.5.2; 3.7.1; 3.7.2; 3.8.1; 3.8.2; 3.9.2; 5.b.1; 6.3.1; 6.b.1; 7.1.2; 8.4.2; 8.5.1; 8.5.2; 8.6.1; 8.7.1; 8.9.2; 8.10.1; 8.10.2; 9.3.2; 9.c.1; 10.3.1; 11.2.1; 11.3.1; 11.5.2; 11.7.1; 11.a.1; 12.2.2; 12.4.2; 16.b.1.

(f). Link to other data for reporting on the Sustainable Development Goals

Provides the standardized name for geographical phenomena (features).

G. Fundamental geospatial data theme: Geology and Soils

THEME DESCRIPTION:

“Geology” is the composition and properties of geological materials (rocks and sediments) underground and outcropping at the Earth’s surface. It includes bedrock, aquifers, geomorphology for land and marine environments, mineral resources and overlying soils. “Soils” are the upper part of the Earth’s crust, formed by mineral particles, organic matter, water, air, and living organisms.

G.1. Feature class: Geology

(a). Logical data model

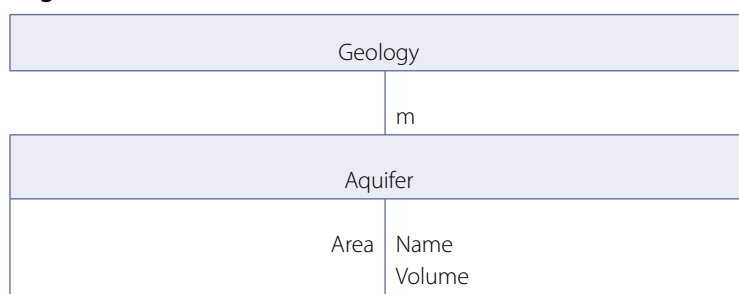
Geology

(b). Description of feature class

“Geology” is the composition and properties of geological materials (rocks and sediments) underground and outcropping at the Earth’s surface. It includes bedrock, aquifers, geomorphology for land and marine environments, mineral resources and overlying soils.

G.1.1 Feature class: Aquifer

(a). Logical data model



(b). Description of feature class

An “Aquifer” is a subsurface water-bearing geological formation consisting of porous rock, fractured rock, sand or gravel. It can hold significant amounts of groundwater.

(c). Description of attributes

Geometry and topology: Area – gives the estimated extent of an aquifer.

Descriptive:

Name – the name given to an aquifer, if any.

Volume – the estimated amount of groundwater stored in an aquifer.

(d). Collection and maintenance of features

(i). Source

Geohydrological records. Alternatively, by digitization of the boundaries from a map.

(ii). Resolution

The resolution should be commensurate with the estimated extent of an aquifer.

(iii). Temporal aspects

The geological formation does not change, but the volume of water stored in an aquifer will change based on the drawdown and replenishment of water.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

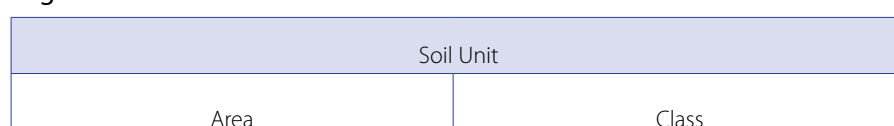
6.1.1; 6.3.2; 6.4.2; 6.5.2; 6.6.1.

(f). Link to other data for reporting on the Sustainable Development Goals

An important source of groundwater, particularly in water-scarce areas.

G.2. Feature class: Soil Unit

(a). Logical data model



(b). Description of feature class

A “Soil Unit” is an area of soil of the same classification type. The classification schema groups soils with a similar range of properties (chemical, physical, biological and fertility) into units, and should be standardized for consistent use across applications.

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Class – the classification of the soil unit.

(d). Collection and maintenance of features*(i). Source*

Soil sampling from interpretation and analysis of multispectral, multitemporal orthoimagery. Alternatively, by digitization of the boundaries from a map.

(ii). Resolution

Soils are a continuous phenomenon and so the boundary of the soil unit will be “fuzzy”. The resolution should be commensurate with this “fuzziness”.

(iii). Temporal aspects:

Soils do not change rapidly, but some characteristics of the soil can change, such as fertility, which results in a change to the soil unit mapped.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

15.1.1; 15.2.1.

Qualifiers of specific indicator:

“Forest” indicates required for forest areas only.

(f). Link to other data for reporting on the Sustainable Development Goals

H. Fundamental geospatial data theme: Land Cover and Land Use

THEME DESCRIPTION:

“Land Cover” is the physical and biological cover of the Earth’s surface. “Land Use” is the current and future planned management and modification of the natural environment for different human purposes or economic activities.

H.1. Feature class: Land Cover Unit

(a). Logical data model

Land Cover Unit	
Area or grid	Class

(b). Description of feature class

A “Land Cover Unit” is an area of land cover of the same classification type. The classification schema should be standardized for consistent use across applications.

(c). Description of attributes

Geometry and topology: Area or raster (cells).

Descriptive:

Class – the classification of the unit of land cover.

(d). Collection and maintenance of features

(i). Source

Land cover mapping from interpretation and analysis of multispectral, multitemporal orthoimagery. Alternatively, by digitization of the boundaries from a map.

(ii). Resolution

Land cover is a continuous phenomenon and so the boundary of the land cover unit will be “fuzzy”. The resolution should be commensurate with this “fuzziness”.

(iii). Temporal aspects

Land cover changes with time, in some cases within a short space of time. These changes in land cover are an important measure.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

15.1.1; 15.2.1; 15.3.1; 15.4.2; 15.9.1.

Qualifiers of specific indicators:

“Forest” to include tree species.



“Degraded” indicates those areas classed as degraded.

“Mountain area” indicates required for mountain areas only.

(f). Link to other data for reporting on the Sustainable Development Goals

Strong correlation with land use.

(g). Applicable standards

ISO 19144-1:2009, Geographic information – Classification systems – Part 1: Classification system structure.

ISO 19144-2:2012, Geographic information – Classification systems – Part 2: Land Cover Meta Language.

H.2. Feature class: Land Use Unit

(a). Logical data model

Land Use Unit	
Area or grid	Class

(b). Description of feature class

A “Land Use Unit” is an area of actual land use of the same classification type. The classification schema should be standardized for consistent use across applications. There is a strong correlation between land cover and land use, and in some applications the two are combined into a land cover/land use classification schema. It is possible that an area can have more than one land use, such as in a unit of land used for a plantation (forestry) and for recreational use (hiking). In such cases the land use units will overlap each other.

In some applications, the land use may be assigned as an attribute to a cadastral land parcel. However, it must be noted that one cadastral land parcel, particularly larger parcels, may have more than one land use, and then the exact extent of each land use will not be known.

Land use is also used in land management where the use of the land is regulated or planned, such as in land use planning schemes (zoned land use) – this is not to be confused with the actual land use as mapped.

(c). Description of attributes

Geometry and topology: Area or raster (cells).

Descriptive:

Class – the classification of the unit of land use.

(d). Collection and maintenance of features

(i). Source

Land use mapping from interpretation and analysis of multispectral, multitemporal orthoimagery and field surveys. Alternatively, by digitization of the boundaries from a map.

(ii). *Resolution*

The resolution of the land use unit is relative to the geographical phenomena that it relates to.

(iii). *Temporal aspects*

Land use changes with time, in some cases within a short space of time based on human activity. These changes in land use are an important measure.

(e) **Use in reporting on the Sustainable Development Goals (indicators and qualifiers)**

Indicators:

2.1.1; 2.1.2; 2.3.1; 2.4.1; 2.5.2; 5.a.1; 11.5.2; 11.7.1.

Qualifiers of specific indicator:

“Agric” indicates required for agricultural land use only, including crops and livestock.

(f) **Link to other data for reporting on the Sustainable Development Goals**

Strong correlation with land cover.

Can be associated with cadastral land parcel.

Applicable standards

ISO 19144-1:2009, Geographic information – Classification systems – Part 1: Classification system structure.

I. Fundamental geospatial data theme: Land Parcels

THEME DESCRIPTION:

“Land Parcels” are areas of land or more generally of the Earth’s surface (land and/or water) under common rights (such as ownership or easements), claims (such as minerals or indigenous land) or use. This theme can include individual fields and cadastral parcels.

I.1. Feature class: Cadastral Land Parcel

(a). **Logical data model**

Cadastral Land Parcel	
Area	Parcel ID Land tenure

(b). **Description of feature class**

A “Cadastral Land Parcel” is a demarcated piece of land in which humans have legal or customary rights in that piece of land. The type of right in the land is given in a continuum of land tenure types, which is often related to the political system in the country. These rights are usually recorded, in a land registry, for example.



(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Parcel ID – a unique identification for the cadastral land parcel.

Land tenure – the type of land tenure assigned to the holder of the right.

(d). Collection and maintenance of features*(i). Source*

Records of the authority for approving the demarcation of the cadastral land parcel – usually the Surveyor-General.

(ii). Resolution

The resolution of the boundary of the cadastral land parcel must be adequate to remove any dispute over the position of the boundary.

(iii). Temporal aspects

Cadastral land parcels are usually stable over time but can be changed through subdivision or consolidation of land parcels.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

1.4.2; 5.a.1; 11.5.2.

Qualifiers of specific indicators:

“Rural” indicates required in rural area only.

(f). Link to other data for reporting on the Sustainable Development Goals

Cadastral land parcel is linked to land use, in particular in urban areas.

Dwellings are mostly located within cadastral land parcels.

Administrative boundaries often coincide with the boundaries of cadastral land parcels. This then provides a more accurate position of the administrative boundary.

(g). Applicable standards

ISO 19152:2012, Geographic information – Land Administration Domain Model (LADM).

J. Fundamental geospatial data theme: Orthoimagery

THEME DESCRIPTION:

“Orthoimagery” is georeferenced rectified image data of the Earth’s surface from satellites or airborne sensors. Although technically not a theme in its own right, orthoimagery is included as, when interpreted, it is a widely used data source for many other data themes.

J.1. Feature class: Orthoimage

(a). Logical data model

Orthoimage	
Raster	Sensor platform Spatial resolution Spectral bands Radiometric resolution Image date

(b). Description of feature class

An “Orthoimage” is an image of the Earth’s surface, recorded by a sensor, that is subsequently ortho-rectified and georeferenced to a given map projection as a raster image. It is a record of what existed on the Earth’s surface at the time of imaging. Such a record is then used for interpretation and analysis to extract other geospatial features and geographical phenomena.

(c). Description of attributes

Geometry and topology: Raster.

Descriptive:

Sensor platform – the platform carrying the sensor, usually a satellite, aircraft or remote-piloted aerial system (drone).

Spatial resolution – the size of the cells (pixels) of the raster.

Spectral bands – the various electromagnetic spectral bands recorded by the sensor for the image.

Radiometric resolution – the number of digital levels used to express data collected by the sensor.

Image date – the date the sensor recorded the image.

(d). Collection and maintenance of features

(i). Source

Authority responsible for national mapping and/or the satellite operator.

(ii). Resolution

The resolution of the orthoimage will be commensurate with the minimum size of object/

phenomenon to be identified in the image. As a guide, the resolution (pixel size) will be a factor of 2.2 times the size of the smallest object/phenomenon.

(iii). *Temporal aspects*

The orthoimage is a record of the Earth's surface and as such changes. The Earth's surface will therefore require new orthoimages to record the changes that have occurred.

(e). **Use in reporting on the Sustainable Development Goals (indicators and qualifiers)**

Indicators:

1.1.1; 1.2.1; 1.2.2; 1.3.1; 1.4.1; 1.4.2; 1.5.1; 1.5.2; 2.1.1; 2.1.2; 2.3.1; 2.3.2; 2.4.1; 2.5.1; 2.5.2; 3.1.1; 3.2.1; 3.2.2; 3.3.1; 3.3.2; 3.3.3; 3.3.4; 3.3.5; 3.4.1; 3.4.2; 3.5.2; 3.7.1; 3.7.2; 3.8.1; 3.8.2; 3.9.2; 3.9.3; 3.b.1; 3.b.2; 3.c.1; 4.1.1; 4.2.1; 4.2.2; 4.3.1; 4.4.1; 4.6.1; 5.3.1; 5.4.1; 5.a.1; 6.1.1; 6.2.1; 6.3.1; 6.3.2; 6.4.2; 6.6.1; 6.b.1; 7.1.1; 8.4.2; 8.5.1; 8.5.2; 8.6.1; 8.7.1; 8.9.2; 8.10.1; 8.10.2; 9.1.1; 9.c.1; 10.1.1; 10.2.1; 10.3.1; 11.1.1; 11.2.1; 11.3.1; 11.5.1; 11.5.2; 11.6.1; 11.6.2; 11.7.1; 12.2.2; 12.4.2; 13.1.1; 14.1.1; 14.5.1; 14.b.1; 15.1.1; 15.1.2; 15.2.1; 15.3.1; 15.4.1; 15.4.2; 15.9.1; 16.b.1; 17.8.1.

(f). **Link to other data for reporting on the Sustainable Development Goals**

Orthoimagery is a major source for many other data. An orthoimage may also be used as a backdrop to other data to provide a geospatial context to the other data.

(g). **Applicable standards**

ISO 19101-2:2018, Geographic information -- Reference model -- Part 2: Imagery.

ISO 19159-1:2014, Geographic information – Calibration and validation of remote sensing imagery sensors – Part 1: Optical sensors.

ISO/TS 19130:2018, Geographic information – Imagery sensor models for geopositioning.

ISO/TR 19121:2000, Geographic information – Imagery and gridded data.

ISO 19129:2009, Geographic information – Imagery, gridded and coverage data framework.

K. Fundamental geospatial data theme: Physical Infrastructure

THEME DESCRIPTION:

The “Physical Infrastructure” theme includes industrial “utility facilities, and the service delivery facilities associated with administrative and social governmental services such as public administrations, utilities, transport, civil protection, schools and hospitals.

K.1. Feature class: Structure

(a). **Logical data model**

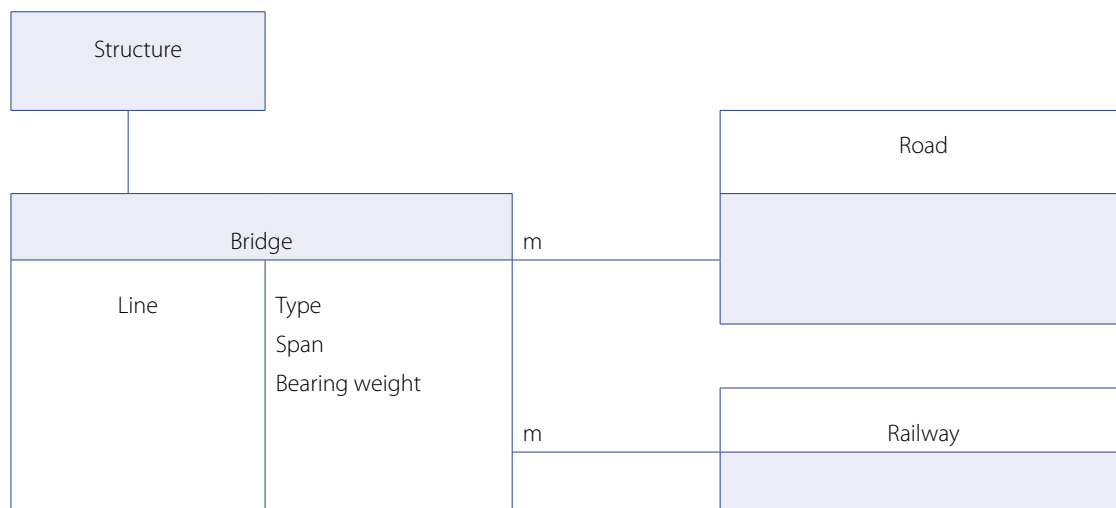
Structure

(b). Description of feature class

A "Structure" is a constructed feature made up of different parts, usually based on an architectural or engineering design. It can be constructed from different materials.

K.1.1 Feature class: Bridge

(a). Logical data model



(b). Description of feature class

A "Bridge" is a structure which spans an obstacle, such as a river or a depression, to carry a road or railway over the obstacle. A bridge may be used to carry both a road and a railway together.

(c). Description of attributes

Geometry and topology: Line – the line will be coincident with the segment of the line of the road or railway.

Descriptive:

Type – construction type, includes a low-level bridge.

Span – length the span of the bridge, in metres.

Bearing weight – the weight the bridge is designed to bear, in metric tons.

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage, and/or records of the transport authority.

(ii). Resolution

The resolution is commensurate with the resolution of the road or railway it is associated with.

(iii). Temporal aspects

Bridges are stable over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

11.5.2.

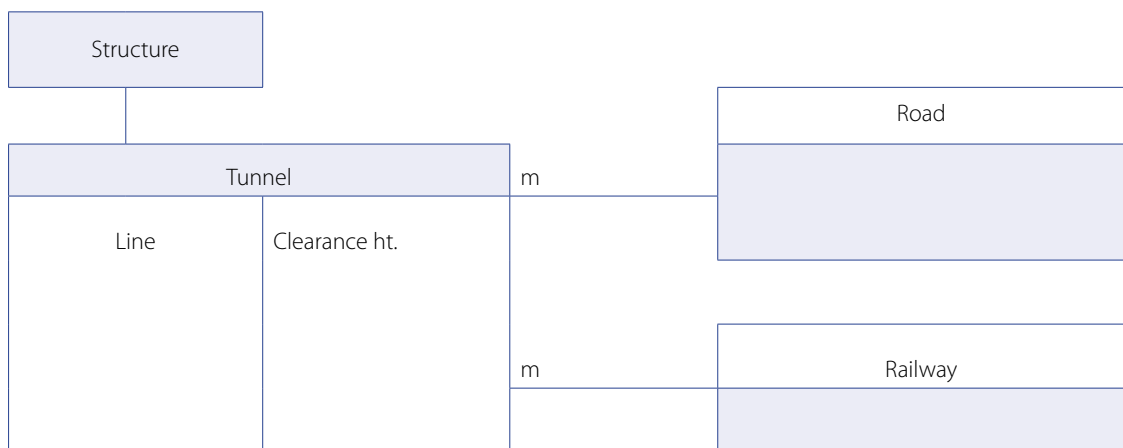
Qualifiers of specific indicator:

“Critical” indicates that only those bridges deemed to be part of critical infrastructure are required.

(f). Link to other data for reporting on the Sustainable Development Goals

K.1.2 Feature class: Tunnel

(a). Logical data model



(b). Description of feature class

A “Tunnel” is a structure which cuts through or under an obstacle, such as a mountain or river, to carry a road or railway through or under the obstacle. A tunnel may be used to carry both a road and a railway together.

(c). Description of attributes

Geometry and topology: Line – the line will be coincident with the segment of the line of the road or railway. The nodes mark the tunnel entrances.

Descriptive:

Clearance ht – the maximum height, in metres, for clearance through the tunnel.

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage and/or the records of the transport authority.

(ii). Resolution

The resolution is commensurate with the resolution of the road or railway it is associated with.

(iii). Temporal aspects

A tunnel is stable over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

11.5.2.

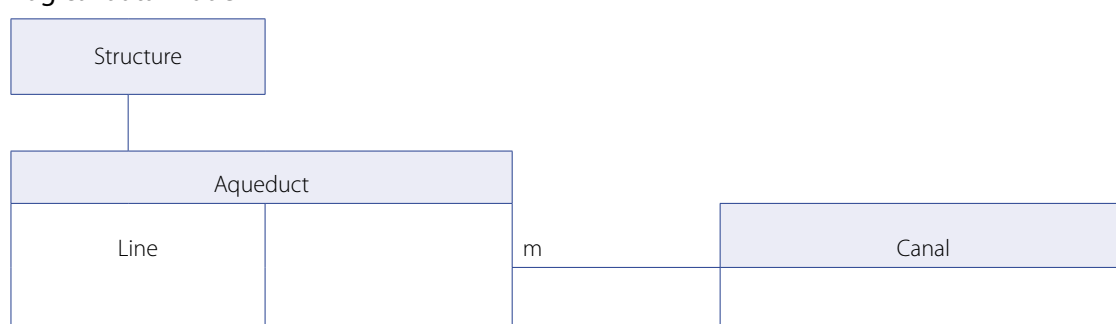
Qualifiers of specific indicator:

“Critical” indicates that only those tunnels deemed to be part of critical infrastructure are required.

(f). Link to other data for reporting on the Sustainable Development Goals

K.1.3 Feature class: Aqueduct

(a). Logical data model



(b). Description of feature class

An “Aqueduct” is a structure for the purpose of supporting a canal in spanning a valley.

(c). Description of attributes

Geometry and topology: Line – the line will be coincident with the segment of the line of the canal.

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage.

(ii). Resolution

The resolution is commensurate with the resolution of the canal it is associated with.

(iii). Temporal aspects

An aqueduct is stable over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

6.1.1.

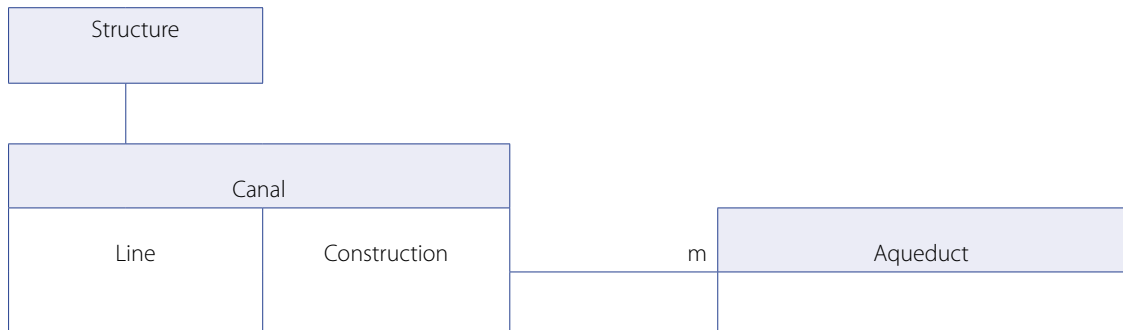
(f). Link to other data for reporting on the Sustainable Development Goals

Part of the carriage of water to areas without a natural source of water.



K.1.4 Feature class: Canal

(a). Logical data model



(b). Description of feature class

A "Canal" is a structure for carrying water from one place to another under the force of gravity.

(c). Description of attributes

Geometry and topology: Line.

Descriptive:

Construction – the type of construction material of the canal.

Value: Lined (membrane)

Concrete

Earth

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage.

(ii). Resolution

The resolution is commensurate with the resolution of the application it is associated with.

(iii). Temporal aspects

Canals are stable over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

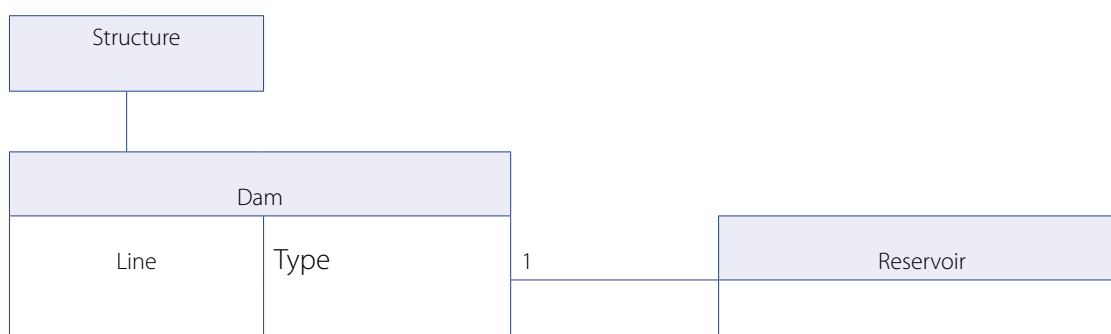
6.1.1.

(f). Link to other data for reporting on the Sustainable Development Goals

Part of the carriage of water to areas without a natural source of water.

K.1.5 Feature class: Dam

(a). Logical data model



(b). Description of feature class

A "Dam" is a structure for containing water in a reservoir, either in a river or a separate depression.

(c). Description of attributes

Geometry and topology: Line.

Descriptive:

Type – the construction material of the dam.

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage.

(ii). Resolution

The resolution is commensurate with the resolution of the reservoir it is associated with.

(iii). Temporal aspects

A dam is stable over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

6.1.1; 6.3.2; 6.4.2; 6.6.1; 11.5.2.

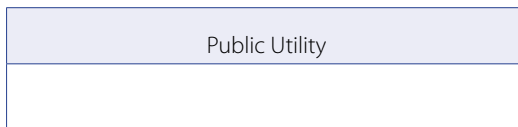
(f). Link to other data for reporting on the Sustainable Development Goals

Part of the water resources system in an area.

Used to control flooding, but if the flooding is excessive and the dam fails then it will be a source of severe flooding.

K.2. Feature class: Public Utility

(a). Logical data model

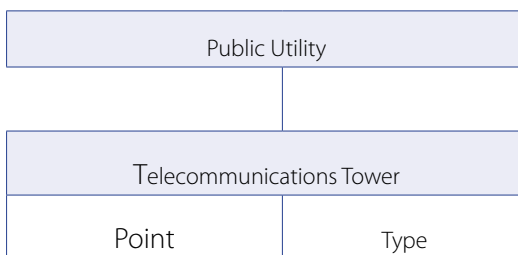


(b). Description of feature class

A “Public Utility” is part of the physical infrastructure that carries or provides services for public benefit.

K.2.1 Feature class: Telecommunications Tower

(a). Logical data model



(b). Description of feature class

A “Telecommunications Tower” is part of the public utilities used for transmitting and/or receiving signals as part of a radio transmission system for radio and television broadcasting, cellular (mobile) networks and microwave transmissions. This can be for both broadcast and point-to-point transmission.

(c). Description of attributes

Geometry and topology: Point.

Descriptive:

Type – the type of signals transmitted based on its purpose.

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage and/or from records of telecommunications companies.

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). Temporal aspects

A telecommunications tower is stable over time, with new towers being built over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

9.c.1.

Qualifiers of specific indicators:

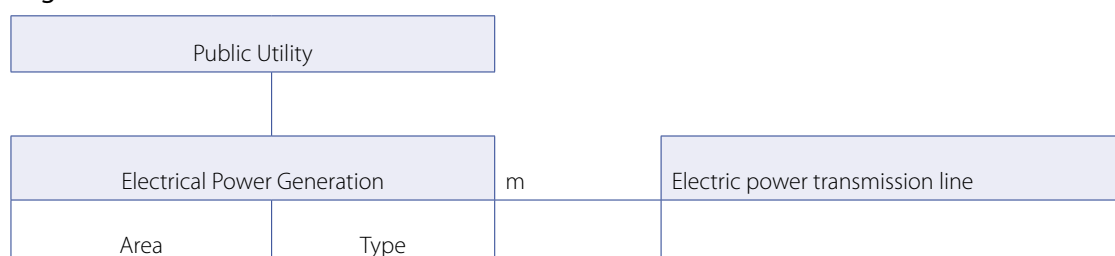
Mobile signal.

(f). Link to other data for reporting on the Sustainable Development Goals

Telecommunications towers are part of the telecommunications network, including the provision of mobile signals. The location of towers determines the coverage of the mobile signal.

K.2.2 Feature class: Electrical Power Generation

(a). Logical data model



(b). Description of feature class

“Electrical Power Generation” is a facility producing electrical energy for transmission, including the national electricity grid, to end users.

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Type – the type of power generation

Value – Coal

Gas

Hydroelectric

Nuclear

Combustion turbine

Solar

Wind

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage, and/or records of the authority responsible for energy.

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). Temporal aspects

Electric power generation is stable over time, with new facilities being built over time.

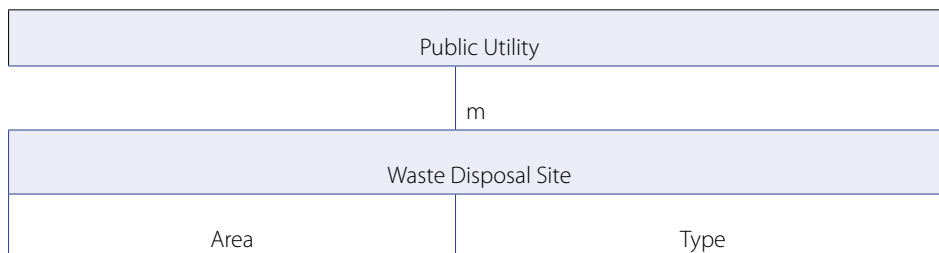
(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

11.5.2.

Qualifiers of specific indicators:

Where deemed to be critical infrastructure.

(f). Link to other data for reporting on the Sustainable Development Goals**K.2.3 Feature class: Waste Disposal Site****(a). Logical data model****(b). Description of feature class**

A “Waste Disposal Site” is an area where waste materials are dumped, usually as part of a landfill area or, in the case of hazardous materials, in containers.

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Type – the type of waste handled at the facility

Value: General waste landfill

Recycling

Hazardous waste

(d). Collection and maintenance of features*(i). Source*

Interpretation from orthoimage, and/or records of the local government (municipality).

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). Temporal aspects

A waste disposal site will change over time when the site is full.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

11.6.1; 12.4.2.

Qualifiers of specific indicators:

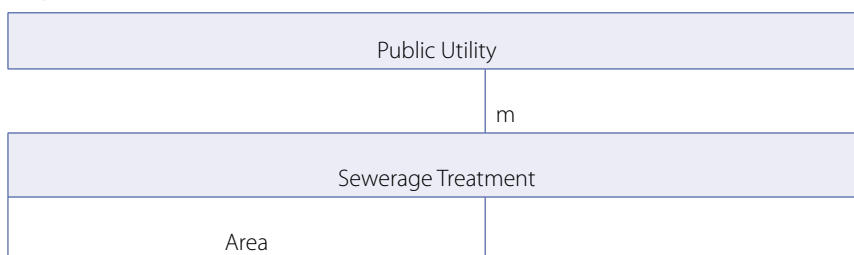
“Landfill. Recycling” indicates required for landfills and for recycling facility.

“Hazardous” indicates waste disposal classed as hazardous materials.

(f). Link to other data for reporting on the Sustainable Development Goals

K.2.4 Feature class: Sewerage Treatment

(a). Logical data model



(b). Description of feature class

“Sewerage Treatment” is a plant for the treatment of sewage where waste matter (effluent from residential and industrial areas) is removed from the water carried in the sewerage pipes. Water circulates through large, round or square purification ponds. When the water is purified to the required standard, it is released into the nearest watercourse or recycled for consumption.

(c). Description of attributes

Geometry and topology: Area.

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage and/or records of the local government (municipality).

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). Temporal aspects

Sewerage treatment is stable over time, with new plants being constructed with urban growth.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

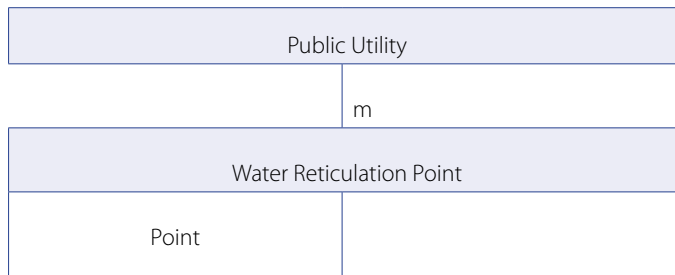
6.2.1; 6.3.1; 11.5.2; 11.6.1.

(f). Link to other data for reporting on the Sustainable Development Goals

Part of the health and sanitation system.

K.2.5 Feature class: Water Reticulation Point

(a). Logical data model



(b). Description of feature class

A “Water Reticulation Point” is a facility for providing potable water, such as a tap connected to a water reticulation pipe or a well point. It excludes potable water taps within a building.

(c). Description of attributes

Geometry and topology: Point.

(d). Collection and maintenance of features

(i). Source

Records of the authority responsible for water management and the local government.

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). Temporal aspects

A water reticulation point may change over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

6.1.1; 6.2.1; 11.5.2.

(f). Link to other data for reporting on the Sustainable Development Goals

Part of basic services – access to potable water.

K.3. Feature class: Public Service

(a). Logical data model:

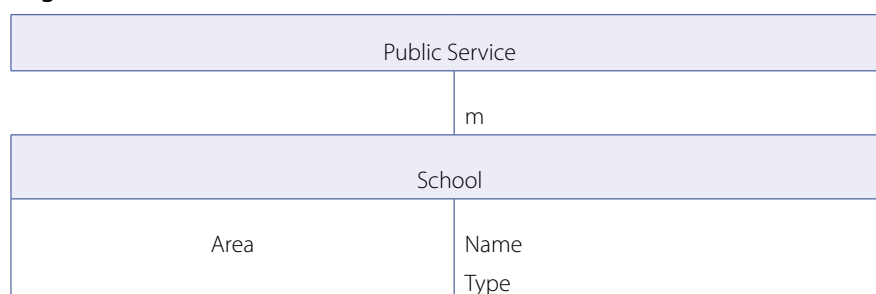


(b). Description of feature class

A “public service” is part of the physical infrastructure and public administration that provides essential services for public benefit.

K.3.1 Feature class: School

(a). Logical data model



(b). Description of feature class

A “School” is a facility for educating and instructing children. This includes from the formative years to the end of schooling. A school can be owned/operated by the public or private sector or a combination of the two. A school generally consists of buildings (classrooms, labs, offices and halls), play areas and sports fields.

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Name – the name of the school

Type – the type of educational facility

Value: Pre-primary school

Primary school

Senior primary school

Secondary school

High school

Agricultural school

Technical school

Industrial school

Special-needs school

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage and/or records of the education authority.

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). Temporal aspects

A school is stable over time, but new schools may be constructed with new developments.



(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

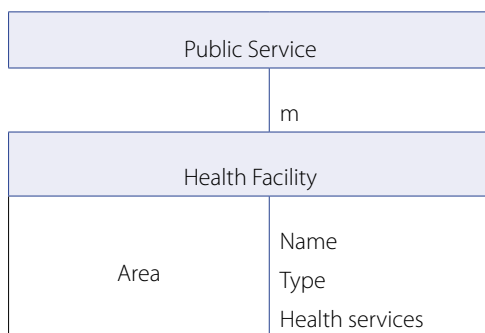
Indicators:

4.a.1; 11.5.2.

(f). Link to other data for reporting on the Sustainable Development Goals

A school is occupied by large numbers of children and the location is of importance in times of disaster.

Accessibility, including proximity, to schools is important, so the location of schools is required.

K.3.2 Feature class: Health Facility**(a). Logical data model****(b). Description of feature class**

A “Health Facility” is a public facility providing health care and related services. It includes such facilities that are owned or operated by both the public sector and the private sector.

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Name: The name given to the facility.

Type: The type or grade of the facility.

Value: Clinic

Day hospital

District hospital

Provincial hospital

University hospital

Health services: the various health services available at the facility (list), such as maternity, paediatrics, surgery, radiology, emergency and trauma, oncology, dental, etc.

(d). Collection and maintenance of features*(i). Source*

Interpretation from orthoimage and/or records of the authority responsible for health services.

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). *Temporal aspects*

A health facility is stable over time, but new health facilities may be constructed with new developments.

(e). **Use in reporting on the Sustainable Development Goals (indicators and qualifiers)**

Indicators:

11.5.2.

(f). **Link to other data for reporting on the Sustainable Development Goals**

The location of a health facility (hospital, clinic) with the required facilities is required in emergencies.

Health facilities are the places where most medical practitioners are located.

L. Fundamental geospatial data theme: Population Distribution

THEME DESCRIPTION:

The population distribution theme covers the geographical distribution of people, including population characteristics.

Refer to statistical area – Population distribution is recorded and reported geospatially as a statistical area (special case of statistical area), which may be an enumerator area, small place area or the same as another type of statistical area or administrative area.

(a). **Use in reporting on the Sustainable Development Goals (indicators and qualifiers)**

Indicators:

1.1.1; 1.2.1; 1.2.2; 1.3.1; 1.4.1; 1.5.1; 2.1.1; 2.1.2; 2.3.2; 3.1.1; 3.2.2; 3.3.1; 3.3.2; 3.3.3; 3.3.4; 3.3.5; 3.4.1; 3.4.2; 3.5.2; 3.7.1; 3.7.2; 3.8.1; 3.8.2; 3.9.2; 3.9.3; 3.b.1; 3.c.1; 4.1.1; 4.2.1; 4.2.2; 4.3.1; 4.4.1; 4.6.1; 5.2.2; 5.3.1; 5.3.2; 5.4.1; 5.6.1; 5.b.1; 7.1.1; 7.1.2; 8.4.2; 8.5.1; 8.5.2; 8.6.1; 8.7.1; 8.9.2; 9.c.1; 10.1.1; 10.2.1; 10.3.1; 11.2.1; 11.5.1; 11.7.1; 12.2.2; 13.1.1; 16.b.1.

(b). **Link to other data for reporting on the Sustainable Development Goals**

Population distribution provides the basic information on population, which links to many other data.

M. Fundamental geospatial data theme: Transport Networks

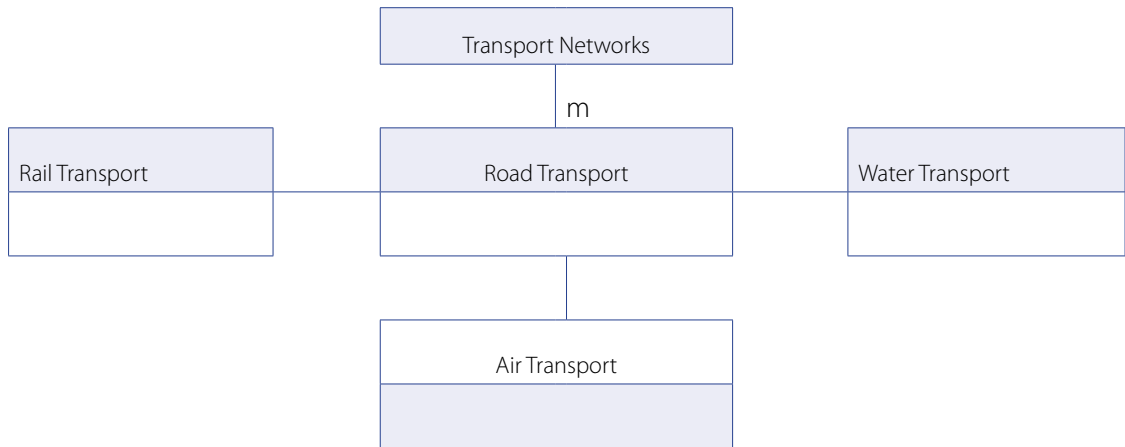
THEME DESCRIPTION:

“Transport Networks” are the suite of road, rail, air, cable and water transport routes and their connectivity.



M.1. Feature class: Road Transport

(a). Logical data model

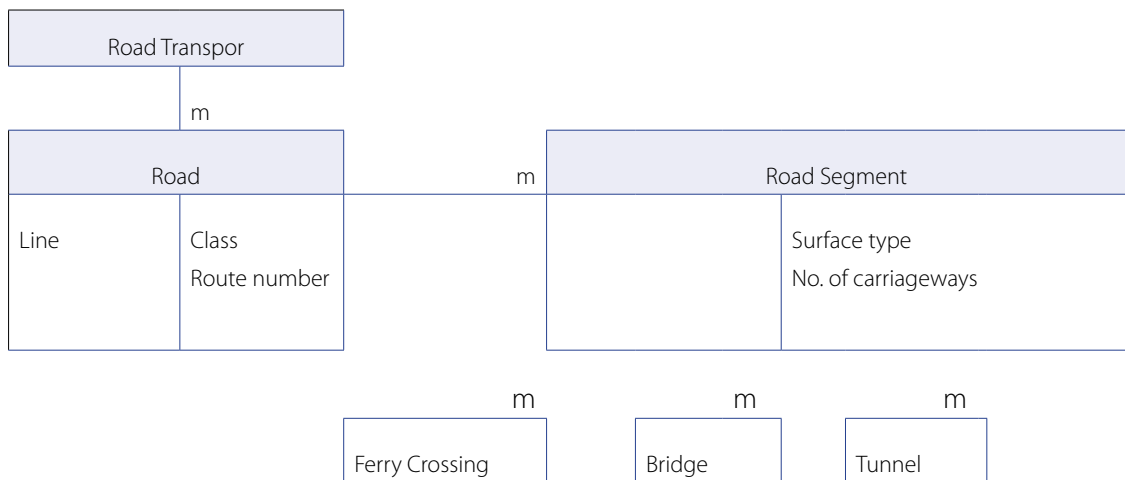


(b). Description of feature class

“Road Transport” is the transport network for use by vehicles, cycles, carts, pedestrians, and animals for the conveyance of humans, animals and goods from one place to another. It is the main connector to other transport networks.

M.1.1 Feature class: Road

(a). Logical data model



(b). Description of feature class

“Road” is a physical linear feature that makes up the road transport network. A road can be engineered or non-engineered. An engineered road is constructed from an engineering design. A non-engineered road is established from regular vehicular use or where the vegetation is cleared by scraping – these roads are called tracks or minor access roads. A road is made up of one or more road segments, based on the characteristics of that segment of the road.

Where a road crosses a bridge or a ferry crossing or passes through a tunnel, the road segment must be represented in order to provide completeness of the route.

(c). Description of attributes

Geometry and topology: Line – the geometry represents the centre-line (middle) of

the road. The road segments must be ordered to comprise the route of the road, each starting and ending with a node. At the intersection between roads, the road segments will end with a common node (intersection topology).

Descriptive:

Class – the classification of the road according to its importance or type within the road network.

Value: National freeway

National road

Provincial road

Urban freeway

District road

Main road

Secondary road

Track

Minor access road

Route number – the route number of the road. The road may also have a name.

Surface type (road segment) – the material of the surface of the vehicular drive part of the road.

Value: Tar (bitumen)

Concrete

Brick

Salt (compacted)

Cobblestone

Gravel (compacted)

Earth

No. of carriageways (road segments) – the number of carriageways of the road, with the default of one. The carriageways are usually parallel to each other, but may deviate in the region of an intersection or in steep areas where the cross section slope requires separation of the carriageways – in such cases each carriageway is shown as a road segment.

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage and/or from the roads authority. Alternatively, from digitization from maps.

(ii). Resolution

The resolution is commensurate with the application, including distance calculations, but must preserve the topological relationship with other features.



(iii). Temporal aspects

Major roads are stable over time, but new roads may be constructed or road segments realigned with new developments. Non-engineered roads may change more frequently.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

3.6.1; 9.1.1; 11.2.1; 11.5.2.

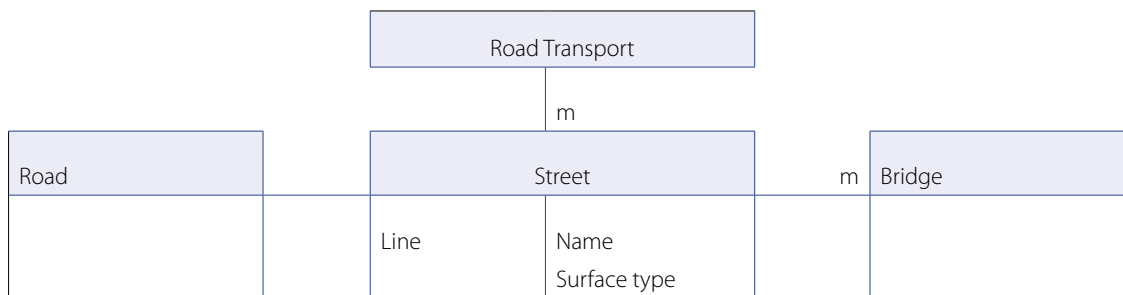
Qualifiers of specific indicators:

“Rural all-weather” indicates only the roads in rural areas classed as all-weather.

“Public transport” indicates only those that are public transport routes.

(f). Link to other data for reporting on the Sustainable Development Goals

Key for transportation.

M.1.2 Feature class: Street**(a). Logical data model****(b). Description of feature class**

A “Street” is a road that provides access within urban areas from the road network. A street is engineered.

(c). Description of attributes

Geometry and topology: Line – the geometry represents the centre-line (middle) of the street. Where streets intersect there must be a common node (intersection topology).

Descriptive:

Name – the name of the street.

Surface type – the material of the surface of the vehicular drive part of the street.

Value: Tar (bitumen)

Concrete

Brick

Salt (compacted)

Cobblestone

Gravel (compacted)

Earth

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage, and/or from the local government (municipality). Alternatively, from digitization from maps.

(ii). Resolution

The resolution is commensurate with the application, including distance calculations, but must preserve the topological relationship with other features.

(iii). Temporal aspects

Streets are stable over time, but new streets may be constructed or realigned with new developments.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

3.6.1; 11.2.1; 11.5.2.

Qualifiers of specific indicators:

“Public transport” indicates only those that are a public transport route.

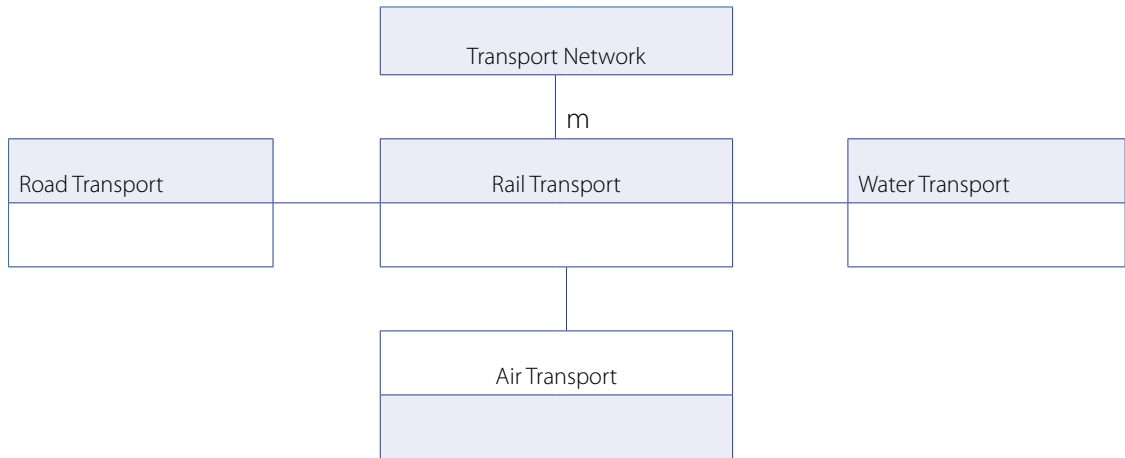
(f). Link to other data for reporting on the Sustainable Development Goals

Key for urban transportation.

M.2. Feature class: Rail Transport

(a). Logical data model



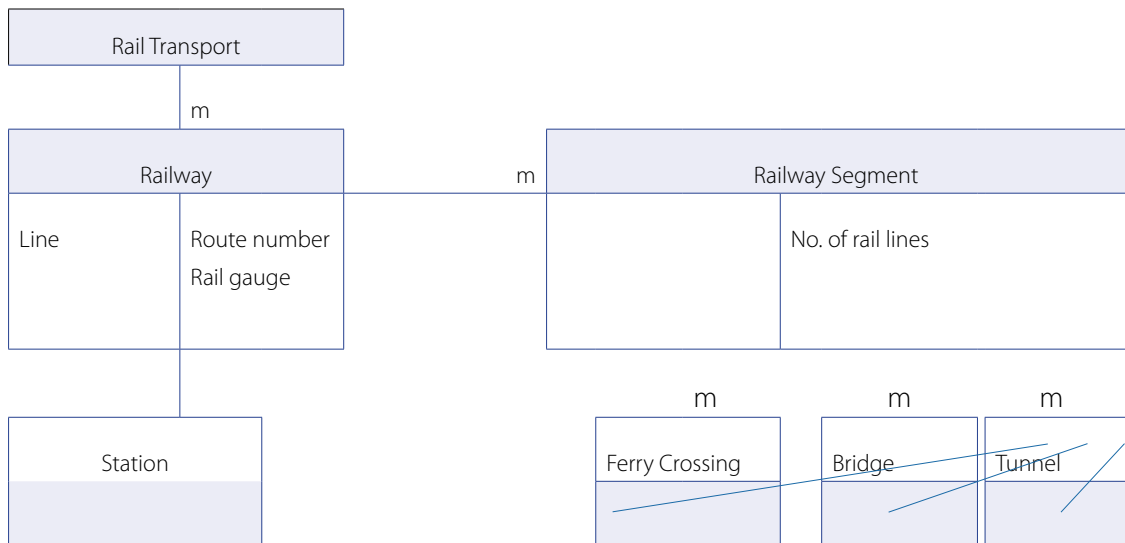


(b). Description of feature class

“Rail Transport” is the transport network for use by trains and trams for the conveyance of humans, animals and goods from one place to another.

M.2.1 Feature class: Railway

(a). Logical data model



(b). Description of feature class

A “Railway” is a physical linear feature that makes up the rail transport network linking stations together. A railway is made up of one or more railway segments, based on the characteristics of that segment of the railway.

Where a railway crosses a bridge or a ferry crossing or passes through a tunnel, the railway segment must be represented in order to provide completeness of the route.

(c). Description of attributes

Geometry and topology: Line – the geometry represents the centre-line (middle) of the railway. The railway segments must be ordered to

comprise the route of the railway, each starting and ending with a node. At the intersection between railways the railway segments will end with a common node (intersection topology). A station is given as a shared node (point representation) with the railway segment.

Descriptive:

Route number – the route number of the railway.

Rail gauge – the width, in metres, between the rails or, for monorail, the value is zero.

No. of rail lines (railway segment) – the number of parallel rail lines. Where the rail lines are not parallel, such as entry and exit from a station, they are given as separate railway segments.

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage, and/or from record of the railway authority. Alternatively, from digitization from maps.

(ii). Resolution

The resolution is commensurate with the application, including distance calculations, but must preserve the topological relationship with other features.

(iii). Temporal aspects

Railways are stable over time, but new railways may be constructed or railway segments realigned with new developments.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

11.2.1; 11.5.2.

Qualifiers of specific indicators:

“Public transport” indicates only those that are public transport routes.

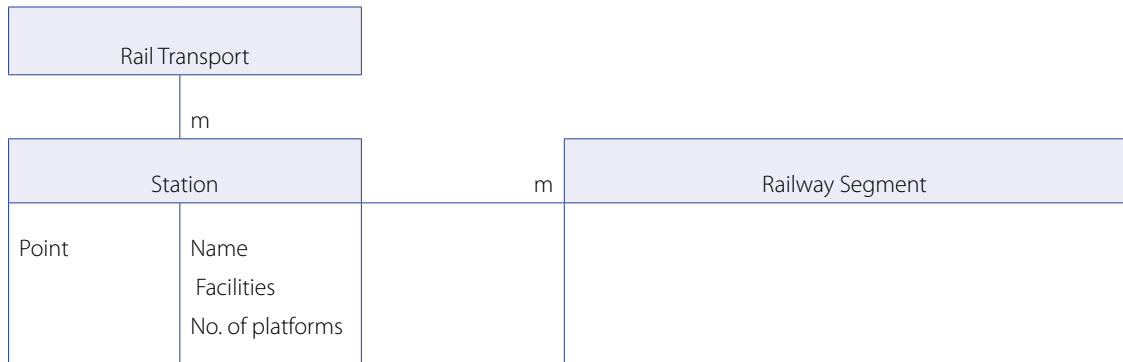
(f). Link to other data for reporting on the Sustainable Development Goals

Part of transportation system.

M.2.2 Feature class: Station

(a). Logical data model



**(b). Description of feature class**

A “Station” is a facility along the railway where trains/trams stop to load/offload passengers and/or goods.

(c). Description of attributes

Geometry and topology: Point.

Descriptive:

Name – name of the station

Facilities – type of facilities at the station.

Values: Passenger only

Goods only

Passenger and goods

No. of platforms – the number of platforms at the station. The number of platforms indicates the number of railway segments at the station.

(d). Collection and maintenance of features*(i). Source*

Interpretation from orthoimage, and/or from records of the railway authority.

(ii). Resolution

The resolution is commensurate with the resolution of the railway, but must preserve the topological relationship with other features.

(iii). Temporal aspects

Stations are stable over time, and are related to changes in the railway.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

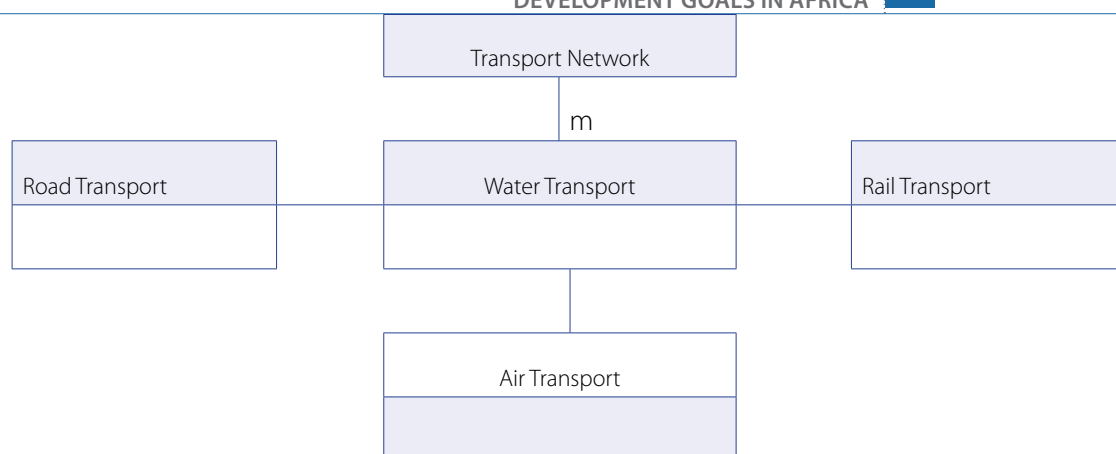
Indicators:

11.2.1.

Qualifiers of specific indicators:

“Public transport” indicates only those that are public transport routes.

(f). Link to other data for reporting on the Sustainable Development Goals**M.3. Feature class: Water Transport****(a). Logical data model**

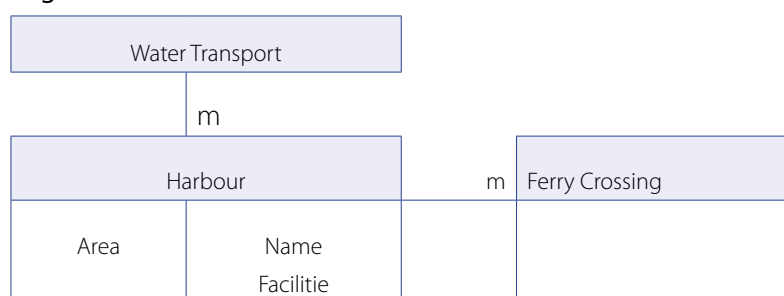


(b). Description of feature class

“Water Transport” is the transport network for use by vessels (ships, boats and ferries) for the conveyance of humans, animals and goods across water from one place to another.

M.3.1 Feature class: Harbour

(a). Logical data model



(b). Description of feature class

A “Harbour” is a facility that is a part of water transport that provides safe berthing for vessels (ships, boats, ferries) and for the loading/offloading of such vessels.

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Name – name of the harbour.

Facilities – type of facilities at the harbour.

Values: Passenger only

Goods only

Passenger and goods

Fishing

(d). Collection and maintenance of features

(i). Source



Interpretation from orthoimage, and/or from records of the transport authority. Alternatively, from digitization from maps.

(ii). *Resolution*

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). *Temporal aspects*

Harbours are stable over time.

(e). **Use in reporting on the Sustainable Development Goals (indicators and qualifiers)**

Indicators:

11.2.1; 11.5.2; 14.b.1.

Qualifiers of specific indicators:

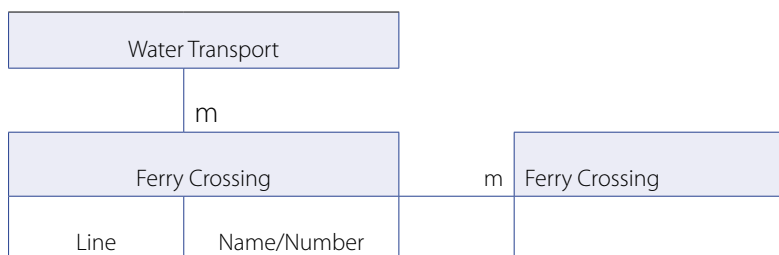
“Public transport” indicates only those that are public transport routes.

“Fishing” indicates only those that have facilities for fishing vessels.

(f). **Link to other data for reporting on the Sustainable Development Goals**

M.3.2 Feature class: Ferry Crossing

(a). **Logical data model**



(b). **Description of feature class**

A “Ferry Crossing” is a facility that is a part of water transport that provides the route for vessels (ships, boats, ferries) to convey humans, animals or goods from one place to another. A ferry crossing may start and end at a harbour or at an embarkation/disembarkation point on a river, lake or reservoir edge.

(c). **Description of attributes**

Geometry and topology: Line.

Descriptive:

Name/Number – the name or number of the ferry crossing

(d). **Collection and maintenance of features**

(i). *Source*

Records of the transport authority. Alternatively, from digitization from maps.

(ii). *Resolution*

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). *Temporal aspects*

Ferry crossings are stable over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

11.2.1; 11.5.2.

Qualifiers of specific indicators:

“Public transport” indicates only those that are public transport routes.

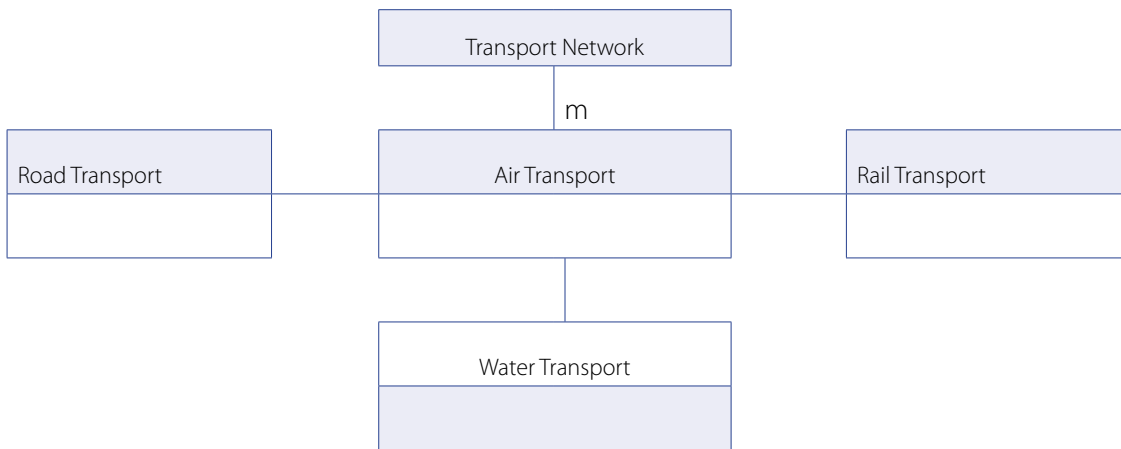
(f). Link to other data for reporting on the Sustainable Development Goals

A ferry crossing is a connector in the transport network.



M.4. Feature class: Air Transport

(a). Logical data model

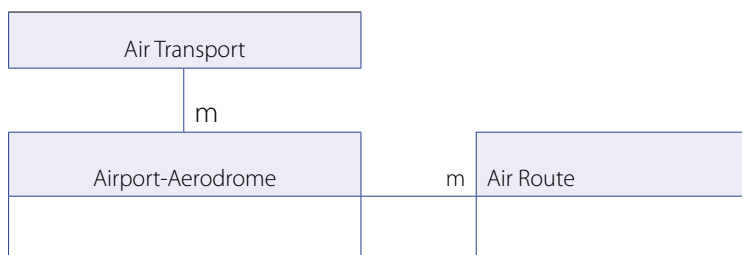


(b). Description of feature class

“Air Transport” is the transport network for use by aircraft for the conveyance of humans, animals and goods through the air from one place to another.

M.4.1 Feature class: Airport-Aerodrome

(a). Logical data model



(b). Description of feature class

“Airport” or “Aerodrome” is a facility that is a part of air transport that provides safe landing and take-off for aircraft and for the loading/offloading of such aircraft.

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Name – name of the airport-aerodrome.

Facilities – type of facilities at the airport.

Value: Immigration and customs.

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage and/or from records of the transport authority.

(ii). *Resolution*

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). *Temporal aspects*

Airports are stable over time.

(e). **Use in reporting on the Sustainable Development Goals (indicators and qualifiers)**

Indicators:

11.2.1; 11.5.2.

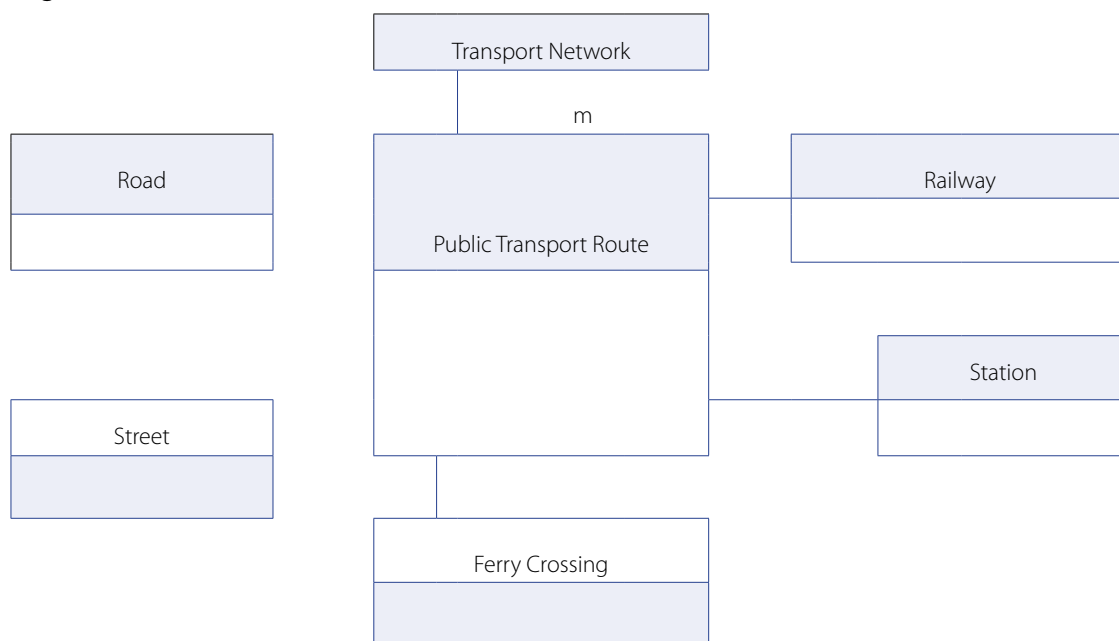
Qualifiers of specific indicators:

“Public transport” indicates only those that are public transport routes.

(f). **Link to other data for reporting on the Sustainable Development Goal**

M.5. Feature class: Public Transport Route

(a). **Logical data model**



(b). **Description of feature class**

A “Public Transport Route” is part of the transport network that provides transport for the public. This includes busses, trains, trams and ferries.

A public transport route is coincident with the geometry of the type of route – road, street, railway, ferry crossing.



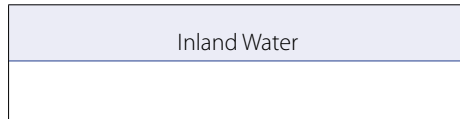
N. Fundamental geospatial data theme: Water

THEME DESCRIPTION:

The “Water” theme covers the extent and conditions of all water features, including rivers, lakes and marine features.

N.1. Feature class: Inland Water

(a). Logical data model

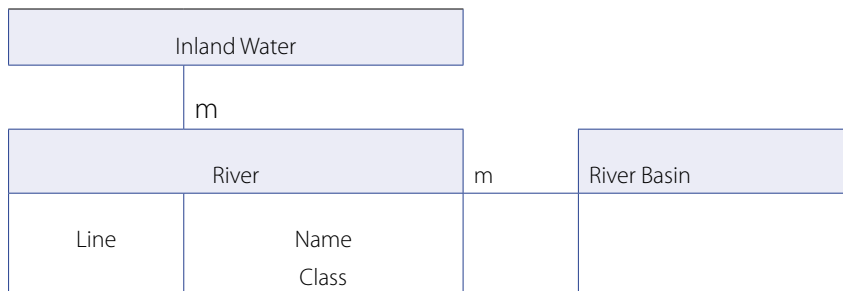


(b). Description of feature class

“Inland Water” includes all water features inland of the coastline. For land-locked countries, it will include all the water features within that country. Some inland water features are shared between countries.

N.1.1 Feature class: River

(a). Logical data model



(b). Description of feature class

A “River” is a watercourse feature where run-off water drains or groundwater appears at the surface (fountain) and then flows under the force of gravity. River includes streams. The river will have a source and an end, which is either another river (for which it is a tributary), a lake or the ocean. Water may flow in the river all year (perennial river) or only during the rainy season (non-perennial river).

(c). Description of attributes

Geometry and topology: Line. A river is represented by the middle of the river. The line segments must be ordered in the downstream direction to provide for the river network topology.

Descriptive:

Name – name of the river.

Class – the order of the river in the river basin.

Values: Primary

Secondary

Tertiary

Quaternary

Quinary

(d). Collection and maintenance of features

(i). Source

Interpretation from orthoimage. Alternatively, from digitization from maps.

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). Temporal aspects

Rivers are stable over time, but may change course in parts due to floods.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

6.3.2; 6.4.2; 6.6.1; 11.5.2.

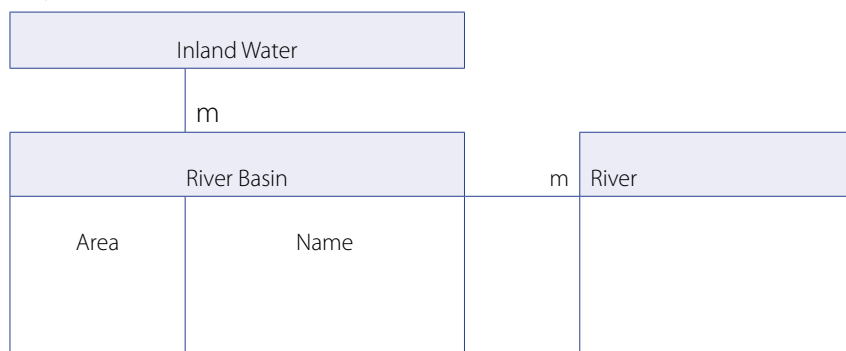
(f). Link to other data for reporting on the Sustainable Development Goals

Rivers are a major source of water.

Rivers or segments of a river can flood during times of abnormal rainfall – even when such rainfall takes place in the upper parts of a river basin. The extent of flooding will depend on the river’s floodplain and the volume of water at the time. An accurate digital elevation model is required to determine the river’s floodplain.

N.1.2 Feature class: River Basin

(a). Logical data model



(b). Description of feature class

“River Basin” is a hydrologic area within which a network of rivers drains water. Each river basin has only one primary river. Adjoining river basins are divided by a watershed.

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Name – name of the river basin.



(d). Collection and maintenance of features*(i). Source*

The boundary (watershed) is determined from a digital elevation model.

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

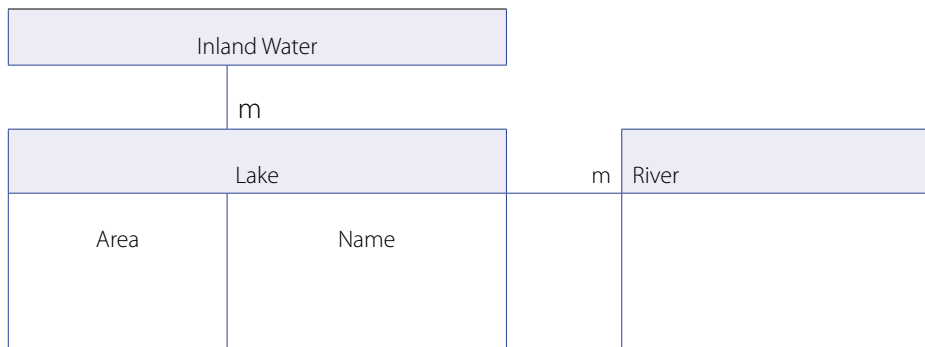
(iii). Temporal aspects

River basins are stable over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

6.4.2; 6.5.2; 6.6.1.

(f). Link to other data for reporting on the Sustainable Development Goals**N.1.3 Feature class: Lake****(a). Logical data model****(b). Description of feature class**

A "Lake" is a body of water contained in a natural depression. It is fed by water from rivers and/or run-off water. A lake may be the source of a river.

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Name – name of the lake.

(d). Collection and maintenance of features*(i). Source*

Interpretation from orthoimage. Alternatively, from digitization from maps.

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). *Temporal aspects*

Lakes are stable over time.

(e). **Use in reporting on the Sustainable Development Goals (indicators and qualifiers)**

Indicators:

6.3.2; 6.4.2; 6.6.1.

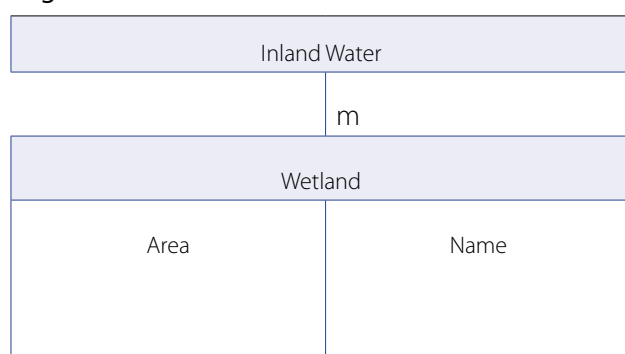
(f). **Link to other data for reporting on the Sustainable Development Goals**

Lakes are a major source of water.

Lakes provide for various water-related economic activities.

N.1.4 Feature class: Wetland

(a). **Logical data model**



(b). **Description of feature class**

A “Wetland” is a shallow depression where the soil is saturated with water, showing surface water, and where vegetation is growing. The presence of the water is due to poor drainage or periodic flooding.

(c). **Description of attributes**

Geometry and topology: Area.

Descriptive:

Name – name of the wetland (if any).

(d). **Collection and maintenance of features**

(i). *Source*

Interpretation from orthoimage.

(ii). *Resolution*

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). *Temporal aspects*

Wetlands are stable over time, but may be lost in periods of drought or due to land development.



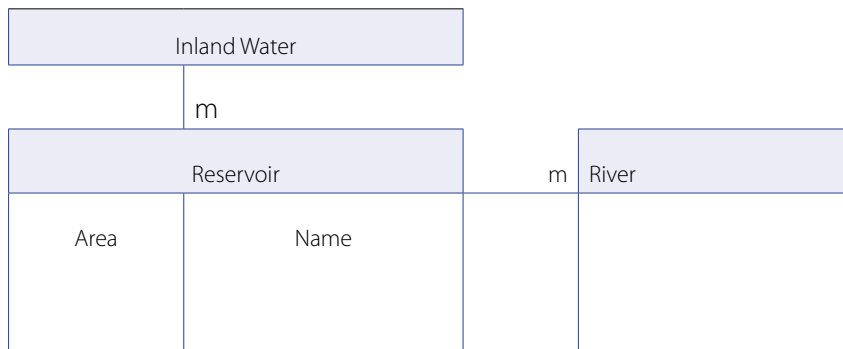
(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

6.3.2; 6.6.1.

(f). Link to other data for reporting on the Sustainable Development Goals

Wetlands are a purifier of water in the water ecosystem.

N.1.5 Feature class: Reservoir**(a). Logical data model****(b). Description of feature class**

A "Reservoir" is a body of water formed by the containment of the water by a constructed barrier, such as a dam. Reservoirs are fed by water from a river, a canal or pipeline and run-off water.

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Name – name of the reservoir (if applicable).

(d). Collection and maintenance of features*(i). Source*

Interpretation from orthoimage.

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). Temporal aspects

Reservoirs are stable over time.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

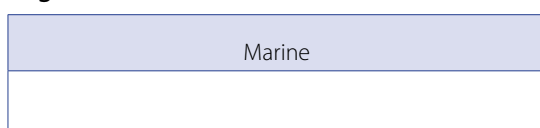
6.1.1; 6.3.2; 6.4.2; 6.6.1; 11.5.2.

(f). Link to other data for reporting on the Sustainable Development Goals

Part of the system of water resources in an area.

N.2. Feature class: Marine

(a). Logical data model

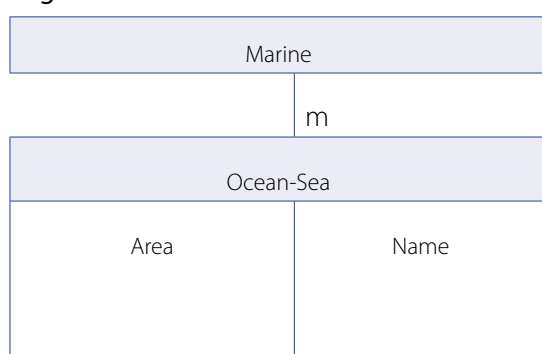


(b). Description of feature class

“Marine” includes all water features lying beyond the coastline of the land.

N.2.1 Feature class: Ocean-Sea

(a). Logical data model



(b). Description of feature class

An “Ocean” or “Sea” is a body of marine water. The water has a high salt content, making it “salty”. An ocean or sea is separated from the land by the coastline. The division between one ocean or sea and another is given by the International Hydrographic Organization (Limits of Seas and Oceans. Special Publication No. 28: https://iho.int/uploads/user/pubs/standards/s-23/S-23_Ed3_1953_EN.pdf).

(c). Description of attributes

Geometry and topology: Area.

Descriptive:

Name – name of the ocean or sea.

(d). Collection and maintenance of features:

(i). Source

Determined by the coastline and marine characteristics.

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). Temporal aspects

Oceans and seas are stable over time.



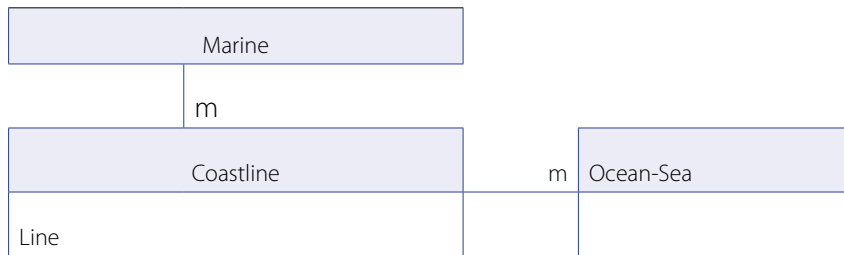
(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

6.6.1; 14.1.1; 14.2.1; 14.3.1; 14.4.1; 14.5.1; 14.7.1; 14.c.1.

(f). Link to other data for reporting on the Sustainable Development Goals

Oceans and seas provide the blue economy.

N.2.2 Feature class: Coastline**(a). Logical data model****(b). Description of feature class**

“Coastline” is taken as the line that joins oceans and seas to the land. It is often taken to be the same as the mean sea level.

Together with tidal records, the coastline is often used to determine the low-water line from which the baselines for determining the limits of territorial waters and Exclusive Economic Zones are measured.

(c). Description of attributes

Geometry and topology: Line.

(d). Collection and maintenance of features*(i). Source*

Interpretation from orthoimage and tidal records. Alternatively, from digitization from maps.

(ii). Resolution

The resolution is commensurate with the application, but must preserve the topological relationship with other features.

(iii). Temporal aspects

Coastlines are stable over time, but may change due to erosion and deposition caused by wave action during stormy conditions.

(e). Use in reporting on the Sustainable Development Goals (indicators and qualifiers)

Indicators:

14.1.1; 14.5.1.

(f). Link to other data for reporting on the Sustainable Development Goals

Coastline is the divider between the land and marine environments.

VII. CONCLUSION

Geospatial information has been recognized by the United Nations as important for measuring, monitoring and reporting on the Sustainable Development Goals. The assessment of the geospatial information required for each of the Sustainable Development Goal indicators has shown that geospatial information is required for 126 (51.4%) of the indicators, covering all 17 Goals.

The geospatial information must be relevant to the purpose and accessed in a timely manner. This requires its having meaningful metadata, making the information discoverable and its fitness for purpose determinable. The geospatial information must comply with the appropriate standards. The geospatial information is arranged into various geospatial feature classes, which must be described in clear terms, including spatial attributes and descriptive attributes so as to avoid any semantic issues across groups of users – as expressed in the geospatial data taxonomy.

The geospatial data taxonomy contributes to the African Action Plan on Geospatial Information for Sustainable Development. In particular, the production and use of authoritative and evidence-based geospatial information are crucial for development agendas.



REFERENCES

United Nations General Assembly resolution 70/1.

Economic Commission for Africa, Geospatial Information for Sustainable Development in Africa: African Action Plan on Global Geospatial Information Management – 2016–2030 (Addis Ababa, 2017).

United Nations, e-Handbook on Sustainable Development Goals Indicators. Available at www.un.org/development/desa/capacity-development/tools/tool/e-handbook-on-sustainable-development-goals-indicators/. Accessed on 25 and 26 October 2019.

Coetzee, Serena, and others (2014). "Part C: Standards for fundamental geo-spatial data sets" in Derek Clarke (ed). Guidelines of Best Practice for the Acquisition, Storage, Maintenance and Dissemination of Fundamental Geospatial Data Sets. Available at http://sdstandards.icaci.org/wp-content/uploads/2014/10/MAfA_SectionC_Integrated_V10.pdf.

United Nations UN-GGIM E/C.20/2018/7/Add.1. Global Geospatial Data Themes. Available at https://ggim.un.org/meetings/GGIM-committee/8th-Session/documents/E-C20-2018-7-Add_1-Global-fundamental-geospatial-data-themes.pdf.

ANNEX 1

Agenda 2030 – sustainable development goals, targets and indicators

(taken from SDG e-Handbook – <https://unstats.un.org/wiki/display/SDGeHandbook>)

Goals and targets	Indicators	Definition of indicator
Goal 1. End poverty in all its forms everywhere		
1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day	1.1.1 Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)	The indicator is defined as the proportion of the population living in households below the international poverty line where the average daily consumption (or income) per person is less than \$1.9 a day measured at 2011 international prices adjusted for purchasing power parity (PPP)
1.2 By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	1.2.1 Proportion of population living below the national poverty line, by sex and age	-
1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable	1.2.2 Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	-
1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable	The indicator measures the proportion of persons who are effectively covered by a social protection system. It includes the main components of social protection: child and maternity benefits, support for people without a job, benefits for persons with disabilities, victims of work injuries and older persons
	1.4.1 Proportion of population living in households with access to basic services	-
	1.4.2 Proportion of total adult population with secure tenure rights to land, (a) with legally recognized documentation, and (b) who perceive their rights to land as secure, by sex and type of tenure	-

Goals and targets	Indicators	Definition of indicator
1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters	1.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population (same indicator as 11.5.1 and 13.1.1)	This indicator measures the number of people who died, went missing or were directly affected by disasters per 100,000 population
	1.5.2 Direct economic loss attributed to disasters in relation to global gross domestic product (GDP)	This indicator measures the ratio of direct economic loss attributed to disasters in relation to GDP.
	1.5.3 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030 (same indicator as 11.b.1 and 13.1.2)	This indicator measures the number of countries that adopt and implement national disaster risk reduction (DRR) strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, with multiple dimensions of the level of implementation.
	1.5.4 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies (same indicator as 11.b.2 and 13.1.3)	-
1.a Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions	1.a.1 Proportion of domestically generated resources allocated by the government directly to poverty reduction programmes	-
	1.a.2 Proportion of total government spending on essential services (education, health and social protection)	-
	1.a.3 Sum of total grants and non-debt-creating inflows directly allocated to poverty reduction programmes as a proportion of GDP	-
1.b Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions	1.b.1 Proportion of government recurrent and capital spending to sectors that disproportionately benefit women, the poor and vulnerable groups	-
Goal 2. End hunger, achieve food security and improve nutrition and promote sustainable agriculture		
2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round	2.1.1 Prevalence of undernourishment	The prevalence of undernourishment is the proportion of the population whose habitual food consumption is insufficient to provide the dietary energy levels that are required to maintain a normal active and healthy life. It is expressed as a percentage.
	2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)	The indicator is defined as the share of the national population that has experienced food insecurity, based on the Food Insecurity Experience Scale (FIES), at moderate or severe levels during the reference period. FIES is a peer reviewed measurement metric developed by the Food and Agriculture Organization of the United Nations (FAO), under the Voices of the Hungry (VOH) project, to compare levels of food insecurity across countries.

Goals and targets	Indicators	Definition of indicator
2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons	2.2.1 Prevalence of stunting (height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age	This indicator is defined as the percentage of children aged 0–59 months, whose length or height-for-age values are below minus two standard deviations from the WHO Child Growth Standards median.
	2.2.2 Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)	The indicator consists of two parts, wasting and overweight: 1. Wasting is the percentage of children aged 0–59 months, whose weight-for-length or height values are below minus two standard deviations from the WHO Child Growth Standards median. 2. Overweight is the percentage of children aged 0–59 months, whose weight-for-length or height values are above two standard deviations from the WHO Child Growth Standards median.
2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment	2.3.1 Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size	-
	2.3.2 Average income of small-scale food producers, by sex and indigenous status	-
2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	2.4.1 Proportion of agricultural area under productive and sustainable agriculture	-
2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed	2.5.1 Number of plant and animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities	This indicator is defined as the number of plant and animal genetic resource for food and agriculture (GRFA) that have been stored in medium or long-term facilities as a means of genetic resource conservation worldwide. Plant and animal genetic resources are counted separately
	2.5.2 Proportion of local breeds classified as being at risk, not at risk or at unknown level of risk of extinction	The indicator presents the percentage of local livestock breeds classified as being at risk, not at risk or at unknown level of risk of extinctions at a certain moment in time

Goals and targets	Indicators	Definition of indicator
<p>2.a Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries</p> <p>2.b Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round</p> <p>2.c Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility</p>	2.a.1 The agriculture orientation index for government expenditures	The Agriculture Orientation Index (AOI) for Government Expenditures is defined as the Agriculture Share of Central Government Expenditure, divided by the Agriculture Share of GDP, where Agriculture refers to the agriculture, forestry, fishing and hunting sector. Government Expenditures are compiled according to the international Classification of the Functions of Government (COFOG), and Agriculture Share of GDP according to the System of National Accounts (SNA).
	2.a.2 Total official flows (official development assistance plus other official flows) to the agriculture sector	Total official flows are the gross disbursements of total Official Development Assistance (ODA) and other official flows from all donors to the agriculture sector.
	2.b.1 Agricultural export subsidies	Agricultural export subsidies are defined in Article 1 paragraph (e) of the World Trade Organization (WTO) Agreement on Agriculture. Members notify to the WTO export subsidies budgetary outlays and quantities of subsidized exports in Tables ES:1 and supporting Tables ES:2. Budgetary outlays and quantities are expressed in a currency (national or other) and in quantity units as per Member's notification practices. The indicator reflects the budgetary outlays notified by WTO Members expressed in the same currency (US dollar).
<p>Goal 3. Ensure healthy lives and promote well-being for all at all ages</p>	2.c.1 Indicator of food price anomalies	The indicator of food price anomalies (IFPA) identifies abnormally high or low prices that occur for a food commodity price series over a period of time. The IFPA relies on a weighted compound growth rate (CGR) that accounts for both within year and across year price growth
3.1 By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births	3.1.1 Maternal mortality ratio	The maternal mortality ratio (MMR) is defined as the annual number of maternal deaths from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, per 100,000 live births, for a specified year.
	3.1.2 Proportion of births attended by skilled health personnel	-

Goals and targets	Indicators	Definition of indicator
3.2 By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births	3.2.1 Under-5 mortality rate	The under-five mortality rate (U5MR) is the probability (expressed as a rate per 1,000 live births) of a child born in a specified year or period dying before reaching the age of five if subject to current age-specific mortality rates.
	3.2.2 Neonatal mortality rate	The neonatal mortality rate (NMR) is the probability that a child born in a specific year or period will die during the first 28 completed days of life if subject to current age-specific mortality rates, expressed per 1000 live births.
3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases	3.3.1 Number of new HIV infections per 1,000 uninfected population, by sex, age and key populations	This indicator is defined as the number of new HIV infections per 1,000 uninfected population.
	3.3.2 Tuberculosis incidence per 100,000 population	The tuberculosis incidence per 100,000 population is defined as the estimated number of new and relapse tuberculosis (TB) cases (all forms of TB, including cases in people living with HIV) arising in a given year, expressed as a rate per 100, 000 population.
	3.3.3 Malaria incidence per 1,000 population	-
	3.3.4 Hepatitis B incidence per 100,000 population	-
	3.3.5 Number of people requiring interventions against neglected tropical diseases	This indicator is defined as the number of people requiring treatment and care for any one of the neglected tropical diseases (NTDs) targeted by the WHO NTD Roadmap and World Health Assembly resolutions.
3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being	3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	This indicator is defined as the percentage of 30-year-old people who would die before their 70th birthday from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases, under the assumption that the experienced mortality rate does not change over time, excluding other causes of death such as accidents or HIV/AIDS. This indicator is calculated using the life table method.
	3.4.2 Suicide mortality rate	This indicator is defined as the number of suicide deaths in a given year divided by the population, expressed per 100,000 persons.

Goals and targets	Indicators	Definition of indicator
3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol	3.5.1 Coverage of treatment interventions (pharmacological, psychosocial and rehabilitation and aftercare services) for substance use disorders	-
	3.5.2 Harmful use of alcohol, defined according to the national context as alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol	Total alcohol per capita consumption (APC) is defined as the total (sum of recorded and unrecorded alcohol) amount of alcohol consumed per person (15 years of age and older) over a calendar year, in litres of pure alcohol, adjusted for tourist consumption. The estimates for the total alcohol consumption are produced by summing up the 3-year average per capita (15 years of age and older) recorded alcohol consumption and an estimate of per capita (15+) unrecorded alcohol consumption for a calendar year.
3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents	3.6.1 Death rate due to road traffic injuries	This indicator is defined as the number of fatalities (deaths) from injuries experienced from road traffic accidents per 100,000 population.
3.7 By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes	3.7.1 Proportion of women of reproductive age (aged 15–49 years) who have their need for family planning satisfied with modern methods	This indicator is defined as the percentage of women of reproductive age (15-49 years) who desire either to have no (additional) children or to postpone the next child and who are currently using a modern contraceptive method.
	3.7.2 Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1,000 women in that age group	This indicator is defined as the annual number of births to females of age groups 10-14 or 15-19 per 1000 females in the respective age group.
3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all	3.8.1 Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population)	-
	3.8.2 Proportion of population with large household expenditures on health as a share of total household expenditure or income	This indicator is defined as the proportion of population that spends a large portion of the total household income or expenditure on health-related expenditures. Two thresholds are used to define “large household expenditures on health” – (1) greater than 10%; and (2) greater than 25% of total household expenditure or income.

Goals and targets	Indicators	Definition of indicator
3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	3.9.1 Mortality rate attributed to household and ambient air pollution	This indicator is defined as the mortality attributable to the joint effects of household and ambient air pollution, and can be expressed as per 100,000 population for any given population group (e.g. children under 5 years of age).
	3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)	This indicator is defined as the number of deaths from unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe WASH services) in a year per 100,000 population.
	3.9.3 Mortality rate attributed to unintentional poisoning	This indicator is defined as the number of deaths from unintentional poisonings in a year per 100,000 population.
3.a Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate	3.a.1 Age-standardized prevalence of current tobacco use among persons aged 15 years and older	-
3.b Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all	3.b.1 Proportion of the target population covered by all vaccines included in their national programme	-
	3.b.2 Total net official development assistance to medical research and basic health sectors	This indicator is defined as the total amount of gross disbursements of official development assistance from all donors to medical research and basic health sectors.
	3.b.3 Proportion of health facilities that have a core set of relevant essential medicines available and affordable on a sustainable basis	-

Goals and targets	Indicators	Definition of indicator
3.c Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States	3.c.1 Health worker density and distribution	<p>This indicator consists of four sub-indicators.</p> <p>Density of physicians: The density of physicians is defined as the number of physicians, including generalists and specialist medical practitioners per 1,000 population in the given national and/or subnational area.</p> <p>Density of nursing and midwifery personnel: The density of nursing and midwifery personnel is defined as the number of nursing and midwifery personnel per 1,000 population in the given national and/or subnational area.</p> <p>Density of dentistry personnel: The density of dentistry personnel is defined as the number of dentists, dental technician/assistants and related occupation personnel per 1,000 population in the given national and/or subnational area.</p> <p>Density of pharmaceutical personnel: The density of pharmaceutical personnel is defined as the number of pharmacists, pharmaceutical, technicians/assistants and related occupation personnel per 1,000 population in the given national and/or subnational area.</p>
3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks	3.d.1 International Health Regulations (IHR) capacity and health emergency preparedness	-
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all		
4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	This indicator is defined as the percentage of children and young people who have achieved a minimum proficiency level in (i) reading and (ii) mathematics during primary (Grade 2 or 3) and at the end of primary and lower secondary education.
4.2 By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education	4.2.1 Proportion of children under 5 years of age who are developmentally on track in health, learning and psychosocial well-being, by sex	-
	4.2.2 Participation rate in organized learning (one year before the official primary entry age), by sex	This indicator is defined as the percentage of children aged one year younger than the official entry age to primary education who participate in one or more organized learning programmes, including programmes which offer a combination of education and care. Participants in early childhood education and primary education are both included. The age considered will vary by country depending on the official entry age to primary education.

Goals and targets	Indicators	Definition of indicator
4.3 By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university	4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex	This indicator is defined as the percentage of youth and adults in a given age range (e.g. 15-24 years, 25-64 years, etc.) participating in formal or non-formal education or training in a given time period (e.g. last 12 months)
4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship	4.4.1 Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill	This indicator is defined as the percentage of youth (aged 15-24 years) and adults (aged 15 years and above) that have undertaken certain computer-related activities in a given time period (e.g. last three months).
4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations	4.5.1 Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict-affected, as data become available) for all education indicators on this list that can be disaggregated	This indicator is defined as the ratio of the value of the underlying indicator (e.g. 4.1.1) for one sub-group to that of another. Typically, the value for the likely more disadvantaged group is the numerator. A value of exactly 1 indicates parity between the two groups, although, for analytical purposes, values between 0.97 and 1.03 are typically assumed to be at parity.
4.6 By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy	4.6.1 Proportion of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex	This indicator is defined as the proportion of youth (aged 15-24 years) and of adults (aged 15 years and above) who have achieved or exceeded a given level of proficiency in (a) literacy and (b) numeracy. The fixed or minimum level of proficiency is measured relative to literacy and numeracy scales defined according to national, regional and international learning assessments.
4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development	4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	-

Goals and targets	Indicators	Definition of indicator
4.a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all	4.a.1 Proportion of schools with access to (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic hand-washing facilities (as per the WASH indicator definitions)	The indicator is defined as the percentage of schools by level of education (primary, lower secondary and upper secondary education) with access to the following facilities: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic hand-washing facilities.
4.b By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries	4.b.1 Volume of official development assistance flows for scholarships by sector and type of study	The indicator is defined as the gross disbursements of total official development assistance from all donors for scholarships.
4.c By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States	4.c.1 Proportion of teachers in: (a) pre-primary; (b) primary; (c) lower secondary; and (d) upper secondary education who have received at least the minimum organized teacher training (e.g. pedagogical training) pre-service or in-service required for teaching at the relevant level in a given country	This indicator is defined as the percentage of teachers by level of education taught (pre-primary, primary, lower secondary and upper secondary education) who have received at least the minimum organized pedagogical teacher training pre-service and in-service required for teaching at the relevant level in a given country.
Goal 5. Achieve gender equality and empower all women and girls		
5.1 End all forms of discrimination against all women and girls everywhere	5.1.1 Whether or not legal frameworks are in place to promote, enforce and monitor equality and non-discrimination on the basis of sex	This indicator measures government efforts to put in place legal frameworks that promote, enforce and monitor gender equality. The legal frameworks are assessed using a questionnaire comprising 44 binary questions under four areas: overarching legal frameworks and public life; violence against women; employment and economic benefits; marriage and family.
5.2 Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation	5.2.1 Proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by form of violence and by age	This indicator is defined as the percentage of ever-partnered women and girls aged 15 years and above who have experienced physical, sexual or psychological violence by a current or former intimate partner, in the past 12 months.
	5.2.2 Proportion of women and girls aged 15 years and older subjected to sexual violence by persons other than an intimate partner in the previous 12 months, by age and place of occurrence	This indicator is defined as the percentage of ever-partnered women and girls aged 15 years and above who have experienced sexual violence by persons other than an intimate partner, in the past 12 months

Goals and targets	Indicators	Definition of indicator
5.3 Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation	5.3.1 Proportion of women aged 20–24 years who were married or in a union before age 15 and before age 18	This indicator is defined as the percentage of women aged 20-24 years who were first married or in a union before age 15 and before age 18.
	5.3.2 Proportion of girls and women aged 15–49 years who have undergone female genital mutilation/cutting, by age	This indicator is defined as the percentage of girls and women aged 15–49 years who have undergone female genital mutilation/cutting.
5.4 Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate	5.4.1 Proportion of time spent on unpaid domestic and care work, by sex, age and location	This indicator is defined as the proportion of time spent in a day on unpaid domestic and care work by men and women. Unpaid domestic and care work refers to activities related to the provision of services for own final use by household members, or by family members living in other households. These activities are listed in ICATUS 2016 under the major divisions “3. Unpaid domestic services for household and family members” and “4. Unpaid caregiving services for household and family members”.
	5.5.1 Proportion of seats held by women in (a) national parliaments and (b) local governments	5.5.1 Sub-indicator (b) – The proportion of positions held by women in local government. It is expressed as a percentage of elected positions held by women in legislative/ deliberative bodies of local government.
5.5 Ensure women’s full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	5.5.2 Proportion of women in managerial positions	This indicator refers to the proportion of females in the total number of persons employed in managerial positions. It is recommended to use two different measures jointly for this indicator: the share of females in (total) management and the share of females in senior and middle management (thus excluding junior management). The joint calculation of these two measures provides information on whether women are more represented in junior management than in senior and middle management, thus pointing to an eventual ceiling for women to access higher-level management positions. In these cases, calculating only the share of women in (total) management would be misleading, in that it would suggest that women hold positions with more decision-making power and responsibilities than they actually do.
	5.6.1 Proportion of women aged 15–49 years who make their own informed decisions regarding sexual relations, contraceptive use and reproductive health care	This indicator is defined as the percentage of women aged 15-49 years who are married (or in union), who make their own decisions on all three areas – sexual intercourse with their partner, use of contraception, and their healthcare.
5.6 Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences	5.6.2 Number of countries with laws and regulations that guarantee full and equal access to women and men aged 15 years and older to sexual and reproductive health care, information and education	-

Goals and targets	Indicators	Definition of indicator
5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws	5.a.1 (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure	This indicator is divided into two sub-indicators: sub-indicator (a) is defined as the prevalence of people in the agricultural population with ownership or tenure rights over agriculture land; and sub-indicator (b) is defined as the share of women in the agricultural population with ownership or tenure rights over agricultural land
5.b Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women	5.a.2 Proportion of countries where the legal framework (including customary law) guarantees women's equal rights to land ownership and/or control	-
5.c Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels	5.b.1 Proportion of individuals who own a mobile telephone, by sex	This indicator is defined as the percentage of individuals who own a mobile telephone.
5.c Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels	5.c.1 Proportion of countries with systems to track and make public allocations for gender equality and women's empowerment	This indicator is defined as the percentage of countries that track budget allocations for gender equality and women's empowerment (GEWE) throughout the public finance management cycle and make these allocations publicly available. The indicator measures three criteria. The first focuses on the intent of a government to address GEWE by identifying if it has programmes/policies on GEWE and corresponding resource allocations to support implementation. The second criterion assesses if a government has mechanisms throughout the public financial management cycle to track resource allocations towards these policy goals. The third focuses on transparency of data by assessing the existence of provisions to make information about allocations for GEWE publicly available. While this indicator is monitored at the global level, a country can assess its own status according to the international criteria. It can also track its progress over time and compare its system to those of other countries.
Goal 6. Ensure availability and sustainable management of water and sanitation for all		
6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	6.1.1 Proportion of population using safely managed drinking water services	This indicator is defined as the proportion of population using an improved drinking water source which is accessible on premises, available when needed and free from faecal and priority chemical contamination.

Goals and targets	Indicators	Definition of indicator
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water	This indicator includes two sub-indicators: (a) proportion of population using safely managed sanitation services and (b) proportion of population with a hand-washing facility with soap and water. Proportion of population using safely managed sanitation services is currently measured by the proportion of the population using an improved sanitation facility which is not shared with other households and where excreta are safely treated and disposed of in situ or transported and treated off-site.
6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	6.3.1 Proportion of wastewater safely treated	-
	6.3.2 Proportion of bodies of water with good ambient water quality	-
6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	6.4.1 Change in water-use efficiency over time	-
	6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	This indicator is defined as the ratio of total freshwater withdrawn by all major sectors to total renewable freshwater resources, after taking into account environmental flows requirements. It is expressed as a percentage.
6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	6.5.1 Degree of integrated water resources management implementation (0–100)	-
	6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation	This indicator is defined as the percentage of transboundary basin area within a country with an operational arrangement for water cooperation with other countries.
6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1 Change in the extent of water-related ecosystems over time	-
6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	6.a.1 Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan	This indicator is defined as the percentage of total water and sanitation-related official development assistance disbursements that are included in the government budget of developing countries.

Goals and targets	Indicators	Definition of indicator
6.b Support and strengthen the participation of local communities in improving water and sanitation management	6.b.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management	This indicator is defined as the percentage of local administrative units (as defined by the national government) that have established and operational policies and procedures by which individuals and communities can participate in decision-making on water and sanitation management.
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all		
7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	7.1.1 Proportion of population with access to electricity	-
	7.1.2 Proportion of population with primary reliance on clean fuels and technology	This indicator is defined as the number of people using clean fuels and technologies for domestic cooking, heating and lighting divided by total population reporting any cooking, heating or lighting. It is expressed as a percentage.
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption	The renewable energy share in total final consumption is the percentage of final consumption of energy that is derived from renewable resources.
7.3 By 2030, double the global rate of improvement in energy efficiency	7.3.1 Energy intensity measured in terms of primary energy and GDP	Energy intensity is defined as the total energy supplied to the economy per unit value of economic output. It is measured in megajoules per United States Dollar.
7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	7.a.1 International financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems	This indicator is defined as the total public international financial flows, i.e. official development assistance and other official flows and the IRENA (renewable energy) flows, to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems. They are expressed in current United States Dollars.
7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support	7.b.1 Investments in energy efficiency as a proportion of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services	-
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all		
8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries	8.1.1 Annual growth rate of real GDP per capita	This indicator is defined as the percentage change in the real GDP per capita between two consecutive years.

Goals and targets	Indicators	Definition of indicator
8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors	8.2.1 Annual growth rate of real GDP per employed person	<p>This indicator conveys the growth rate of real GDP produced by unit of labour input. This indicator is generally defined as the percentage change in the real GDP (at base year constant prices) per employed person—also known as labour productivity—between two consecutive years.</p> <p>However, labour input more widely refers to all persons who contribute to the production of goods and services within the SNA production boundary, not only the employed. In fact, according to the new standards laid out in the 2013 Resolution concerning statistics of work, employment and labour underutilization, the labour input contributing to the GDP comprises not only employment (work done for use by others for pay or profit) but also own-use production of goods, unpaid trainee work and some forms of volunteer work as well.</p>
8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services	8.3.1 Proportion of informal employment in non-agriculture employment, by sex	This indicator is defined as the percentage of non-agricultural employment that is classified as informal employment.
8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead	8.4.1 Material footprint, material footprint per capita, and material footprint per GDP (same as Indicator 12.2.1)	-
	8.4.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP (same Indicator as 12.2.2)	Domestic Material Consumption (DMC) is a standard material flow accounting (MFA) indicator and reports the apparent annual consumption of materials in a national economy. The indicator can also be expressed per capita and per GDP.
8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities	This indicator is defined as the mean hourly earnings of employees from paid employment, disaggregated by sex, occupation, age and disability status.
	8.5.2 Unemployment rate, by sex, age and persons with disabilities	This indicator is defined as the percentage of persons in the labour force who are unemployed, disaggregated by sex, age and disability status.

Goals and targets	Indicators	Definition of indicator
8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training	8.6.1 Proportion of youth (aged 15–24 years) not in education, employment or training	This indicator is defined as the percentage of young persons (aged 15-24 years) not in education, employment or training, out of the total youth population. It is also called the 'youth NEET rate'.
8.7 Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms	8.7.1 Proportion and number of children aged 5–17 years engaged in child labour, by sex and age	This indicator is defined as the number of children (aged 5-17 years) reported to be in child labour during the reference period (usually a week prior to the survey).
8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment	8.8.1 Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status	This indicator is defined as the number of cases of fatal and non-fatal occupational injury per hour worked by the reference population during a given period. However, the most common practice in terms of calculation of occupational injuries indicators is the number of cases of fatal and non-fatal occupational injury per 100,000 workers in the reference group.
	8.8.2 Level of national compliance with labour rights (freedom of association and collective bargaining) based on International Labour Organization (ILO) textual sources and national legislation, by sex and migrant status	-
8.9 By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products	8.9.1 Tourism direct GDP as a proportion of total GDP and in growth rate	-
	8.9.2 Proportion of jobs in sustainable tourism industries out of total tourism jobs	-
8.10 Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all	8.10.1 (a) Number of commercial bank branches per 100,000 adults and (b) number of automated teller machines (ATMs) per 100,000 adults	This indicator has two components. They are defined as the number of (a) commercial bank branches per 100,000 adults, and (b) number of automated teller machines (ATMs) per 100,000 adults in a country.
	8.10.2 Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider	-
8.a Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-related Technical Assistance to Least Developed Countries	8.a.1 Aid for Trade commitments and disbursements	This indicator is defined as gross disbursements and commitments of total official development assistance from all donors for aid for trade.

Goals and targets	Indicators	Definition of indicator
8.b By 2020, develop and operationalize a global strategy for youth employment and implement the Global Jobs Pact of the International Labour Organization	8.b.1 Existence of a developed and operationalized national strategy for youth employment, as a distinct strategy or as part of a national employment strategy	-
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation		
9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	9.1.1 Proportion of the rural population who live within 2 km of an all-season road	-
	9.1.2 Passenger and freight volumes, by mode of transport	This indicator is defined as the sum of the passenger and freight volumes reported for road, rail and air carriers in terms of number of people and metric tonnes of cargo, respectively. These are reported as separate series for each mode of transport and for passenger and freight volume.
9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries	9.2.1 Manufacturing value added as a proportion of GDP and per capita	This indicator is defined as the ratio between manufacturing value added (MVA) and the gross domestic product (GDP), where both are reported in constant US dollars. It is represented as a percentage. MVA per capita is the total MVA divided by the total population of the country.
	9.2.2 Manufacturing employment as a proportion of total employment	This indicator is defined as the percentage of manufacturing employment in the total employment of a country.
9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets	9.3.1 Proportion of small-scale industries in total industry value added	This indicator is defined as the share of manufacturing value added of small-scale manufacturing enterprises in the total manufacturing value added.
	9.3.2 Proportion of small-scale industries with a loan or line of credit	This indicator is defined as the number of "small-scale industries" with an active line of credit or a loan from a financial institution in the reference year as a percentage of the total number of such enterprises.
9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	9.4.1 CO2 emission per unit of value added	This indicator is defined as the ratio between CO2 emissions from fuel combustion and the value added of associated economic activities. It can be calculated either for the whole economy (GDP) or for particular sectors such as manufacturing (manufacturing value added). CO2 emissions per unit of GDP is expressed in kilogrammes of CO2 per USD (in constant prices).

Goals and targets	Indicators	Definition of indicator
9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending	9.5.1 Research and development expenditure as a proportion of GDP	This indicator is defined as the total intramural expenditure on research and experimental development (R&D) performed in the national territory during a specific reference period expressed as a percentage of national GDP).
9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States	9.5.2 Researchers (in full-time equivalent) per million inhabitants	This indicator is defined as the number of researchers (in full-time equivalent) in the national territory during a specific reference period expressed as a proportion of a population of one million.
9.b Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities	9.a.1 Total official international support (official development assistance plus other official flows) to infrastructure	This indicator is defined as the sum of all gross disbursements of official development assistance and other official flows from all donors in support of infrastructure development.
9.c Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020	9.b.1 Proportion of medium and high-tech industry value added in total value added	This indicator is defined as the percentage of medium-high and high technology (MHT) industries to the total value added of all manufacturing industries
	9.c.1 Proportion of population covered by a mobile network, by technology	This indicator is defined as the percentage of inhabitants living within range of a mobile-cellular signal (2G, 3G or LTE), irrespective of whether or not they are mobile phone subscribers or users.
Goal 10. Reduce inequality within and among countries		
10.1 By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average	10.1.1 Growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the total population	-
10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	10.2.1 Proportion of people living below 50 per cent of median income, by sex, age and persons with disabilities	-

Goals and targets	Indicators	Definition of indicator
10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard	10.3.1 Proportion of population reporting having personally felt discriminated against or harassed in the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law (same indicator as 16.b.1)	-
10.4 Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality	10.4.1 Labour share of GDP, comprising wages and social protection transfers	This indicator is defined as the total compensation of all employees within a country as a share of its GDP.
10.5 Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations	10.5.1 Financial Soundness Indicators	-
10.6 Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions	10.6.1 Proportion of members and voting rights of developing countries in international organizations (same Indicator as 16.8.1)	-
10.7 Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies	10.7.1 Recruitment cost borne by employee as a proportion of monthly income earned in country of destination	-
	10.7.2 Number of countries with migration policies that facilitate orderly, safe, regular and responsible migration and mobility of people	-
10.a Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements	10.a.1 Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff	This indicator is defined as the percentage of tariff lines that correspond to a 0% tariff rate on products imported from least developed and developing countries.
10.b Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes	10.b.1 Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows)	This indicator is defined as the sum of all resource flows for development.

Goals and targets	Indicators	Definition of indicator
10.c By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent	10.c.1 Remittance costs as a proportion of the amount remitted	-
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable		
11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing	-
11.2 By 2030, 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 those in vulnerable situations, women, children, persons with disabilities and older persons	11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities	-
11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	11.3.1 Ratio of land consumption rate to population growth rate	-
11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage	11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically	-
	11.4.1 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)	-

Goals and targets	Indicators	Definition of indicator
11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations	11.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population (same indicator as 1.5.1 and 13.1.1)	This indicator measures the number of people who died, went missing or were directly affected by disasters per 100,000 population.
	11.5.2 Direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters	This indicator measures the ratio of direct economic loss attributed to disasters in relation to GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters. This indicator has 3 components.
11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities	This indicator is defined as the proportion of municipal solid waste collected and managed in controlled facilities out of total municipal solid waste generated, by cities.
	11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	This indicator is defined as the annual mean of the daily concentrations of fine suspended particles equal to or less than 2.5 microns in diameters (PM2.5) in urban areas. Particulate matter is an agreed indicator to measure air pollution. This mean is a population-weighted average, e.g. if several cities measure PM2.5, the country mean will be weighted with the corresponding city population, and is expressed in micrograms per cubic metre. To date, particulate matter with a diameter equal or less than 10 microns (PM10) is still more commonly measured than PM2.5 worldwide, although this is evolving (WHO 2016a). To convert PM10 to PM2.5, conversion factors can be used, generally between 0.3-0.8 (WHO, 2014).
11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities	11.7.1 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	-
	11.7.2 Proportion of persons who are victims of physical or sexual harassment, by sex, age, disability status and place of occurrence, in the previous 12 months	-
11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	11.a.1 Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city	-

Goals and targets	Indicators	Definition of indicator
11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels 11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials	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 (same indicator as 1.5.3 and 13.1.2)	This indicator measures the number of countries that adopt and implement national disaster risk reduction (DRR) strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, with multiple dimensions of the level of implementation.
	11.b.2 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies (same indicator as 1.5.4 and 13.1.3)	-
	11.c.1 Proportion of financial support to the least developed countries that is allocated to the construction and retrofitting of sustainable, resilient and resource-efficient buildings utilizing local materials	-
Goal 12. Ensure sustainable consumption and production patterns		
12.1 Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries	12.1.1 Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies	-
	12.2.1 Material footprint, material footprint per capita, and material footprint per GDP (same indicator as 8.4.1)	-
12.2 By 2030, achieve the sustainable management and efficient use of natural resources	12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP (same indicator as 8.4.2)	Domestic Material Consumption (DMC) is a standard material flow accounting (MFA) indicator and reports the apparent annual consumption of materials in a national economy. The indicator can also be expressed per capita and per GDP.
	12.3.1 (a) Food loss index and (b) food waste index	-
12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses		

Goals and targets	Indicators	Definition of indicator
12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	12.4.1 Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement	<p>The indicator refers to the number of parties (countries that have ratified, accepted, approved or accessed) to five multilateral environmental agreements (MEAs) and have submitted relevant information to the secretariat of each MEA, as stipulated by each of the agreements. The five MEAs are:</p> <ol style="list-style-type: none"> 1. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention). 2. Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade (Rotterdam Convention). 3. Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention). 4. Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol). 5. Minamata Convention on Mercury (Minamata Convention).
12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	12.4.2 Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment	-
12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	12.5.1 National recycling rate, tons of material recycled	-
12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities	12.6.1 Number of companies publishing sustainability reports	-
12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	12.7.1 Number of countries implementing sustainable public procurement policies and action plans	-
12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production	12.8.1 Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	-
12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products	12.a.1 Amount of support to developing countries on research and development for sustainable consumption and production and environmentally sound technologies	-
	12.b.1 Number of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools	-

Goals and targets	Indicators	Definition of indicator
12.c Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities	12.c.1 Amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels	-
Goal 13. Take urgent action to combat climate change and its impacts		
13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	13.1.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population (same as indicator 1.5.1 and 11.5.1) 13.1.2 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030 (same indicator as 1.5.3 and 11.b.1) 13.1.3 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies (same indicator as 1.5.4 and 11.b.2)	This indicator measures the number of people who died, went missing or were directly affected by disasters per 100,000 population. This indicator measures the number of countries that adopt and implement national disaster risk reduction (DRR) strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, with multiple dimensions of the level of implementation.
13.2 Integrate climate change measures into national policies, strategies and planning	13.2.1 Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)	-
13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula 13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions	- -

Goals and targets	Indicators	Definition of indicator
<p>13.a Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible</p>	<p>13.a.1 Mobilized amount of United States dollars per year between 2020 and 2025 accountable towards the \$100 billion commitment</p>	-
<p>13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities</p>	<p>13.b.1 Number of least developed countries and small island developing States that are receiving specialized support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate change-related planning and management, including focusing on women, youth and local and marginalized communities</p>	-

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

<p>14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution</p>	<p>14.1.1 Index of coastal eutrophication and floating plastic debris density</p>	-
<p>14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans</p>	<p>14.2.1 Proportion of national exclusive economic zones managed using ecosystem-based approaches</p>	-
<p>14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels</p>	<p>14.3.1 Average marine acidity (pH) measured at agreed suite of representative sampling stations</p>	-

Goals and targets	Indicators	Definition of indicator
<p>14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics</p>	<p>14.4.1 Proportion of fish stocks within biologically sustainable levels</p>	<p>This indicator is defined as the proportion of fish stocks or species that are exploited within the level of maximum sustainable yield (MSY). This indicator is currently reported at the regional and global level.</p>
<p>14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information</p>	<p>14.5.1 Coverage of protected areas in relation to marine areas</p>	<p>This indicator measures the average proportion of each marine Key Biodiversity Area that has been designated as a protected area.</p>
<p>14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation</p>	<p>14.6.1 Degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing</p>	<p>-</p>
<p>14.7 By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism</p>	<p>14.7.1 Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries</p>	<p>-</p>

Goals and targets	Indicators	Definition of indicator
14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries	14.a.1 Proportion of total research budget allocated to research in the field of marine technology	-
14.b Provide access for small-scale artisanal fishers to marine resources and markets	14.b.1 Degree of application of a legal/regulatory/ policy/ institutional framework which recognizes and protects access rights for small-scale fisheries	-
14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of "The future we want"	14.c.1 Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the United Nations Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources	-
Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss		
15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	15.1.1 Forest area as a proportion of total land area 15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type	This indicator is defined as the proportion of forest area of the total land area of a country. It is represented as a percentage. -

Goals and targets	Indicators	Definition of indicator
15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	15.2.1 Progress towards sustainable forest management	<p>This indicator measures progress towards sustainable forest management (SFM) The indicator comprises five sub-indicators:</p> <ol style="list-style-type: none"> (1) Forest area net change rate (2) Above-ground biomass stock in forest (3) Proportion of forest area located within legally established protected areas (4) Proportion of forest area under a long-term forest management plan (5) Forest area under an independently verified forest management certification scheme.
15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	15.3.1 Proportion of land that is degraded over total land area	-
15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	15.4.1 Coverage by protected areas of important sites for mountain biodiversity	-
	15.4.2 Mountain Green Cover Index	-
15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	15.5.1 Red List Index	<p>The Red List Index is an index that measures changes in aggregate extinction risk across groups of species. It is based on the number of species in each category of extinction risk on The International Union for Conservation of Nature (IUCN) Red List of Threatened Species (IUCN 2015) is expressed as changes in an index ranging from 0 to 1. This is an indicator that is monitored at the global level.</p>
15.6 Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed	15.6.1 Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits	<p>This indicator is defined as the number of countries that have adopted legislative, administrative and policy frameworks for the implementation of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (2010). This indicator is an international indicator and not monitored at the national level.</p>
15.7 Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products	15.7.1 Proportion of traded wildlife that was poached or illicitly trafficked (same indicator as 15.c.1)	-

Goals and targets	Indicators	Definition of indicator
15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species	15.8.1 Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species	-
15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts	15.9.1 Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011–2020	-
15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems	15.a.1 Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems (same indicator as 15.b.1)	This indicator is defined as gross disbursements of total official development assistance from all donors for biodiversity. This chapter of the e-handbook only covers the ODA part of the indicator.
15.b Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation	15.b.1 Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems (same indicator as 15.a.1)	This indicator is defined as gross disbursements of total official development assistance from all donors for biodiversity. This chapter of the e-handbook only covers the ODA part of the indicator.
15.c Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities	15.c.1 Proportion of traded wildlife that was poached or illicitly trafficked (same indicator as 15.7.1)	-

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

16.1 Significantly reduce all forms of violence and related death rates everywhere	16.1.1 Number of victims of intentional homicide per 100,000 population, by sex and age	-
	16.1.2 Conflict-related deaths per 100,000 population, by sex, age and cause	-
	16.1.3 Proportion of population subjected to (a) physical violence, (b) psychological violence and (c) sexual violence in the previous 12 months	-
	16.1.4 Proportion of population that feel safe walking alone around the area they live	-

Goals and targets	Indicators	Definition of indicator
16.2 End abuse, exploitation, trafficking and all forms of violence against and torture of children	16.2.1 Proportion of children aged 1–17 years who experienced any physical punishment and/or psychological aggression by caregivers in the past month	This indicator is defined as the percentage of children aged 1-17 years who experienced any physical punishment or psychological aggression or both by caregivers in the past month.
	16.2.2 Number of victims of human trafficking per 100,000 population, by sex, age and form of exploitation	-
	16.2.3 Proportion of young women and men aged 18–29 years who experienced sexual violence by age 18	This indicator is defined as the percentage of young women and men (aged 18-29 years) who experienced sexual violence by the age of 18. This indicator is always reported on separately for women and men.
16.3 Promote the rule of law at the national and international levels and ensure equal access to justice for all	16.3.1 Proportion of victims of violence in the previous 12 months who reported their victimization to competent authorities or other officially recognized conflict resolution mechanisms	-
	16.3.2 Unsentenced detainees as a proportion of overall prison population	-
16.4 By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime	16.4.1 Total value of inward and outward illicit financial flows (in current United States dollars)	-
	16.4.2 Proportion of seized, found or surrendered arms whose illicit origin or context has been traced or established by a competent authority in line with international instruments	-
16.5 Substantially reduce corruption and bribery in all their forms	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months	-
	16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months	-
16.6 Develop effective, accountable and transparent institutions at all levels	16.6.1 Primary government expenditures as a proportion of original approved budget, by sector (or by budget codes or similar)	-
	16.6.2 Proportion of population satisfied with their last experience of public services	-

Goals and targets	Indicators	Definition of indicator
16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels	16.7.1 Proportions of positions in national and local institutions, including (a) the legislatures; (b) the public service; and (c) the judiciary, compared to national distributions, by sex, age, persons with disabilities and population groups	-
	16.7.2 Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group	-
16.8 Broaden and strengthen the participation of developing countries in the institutions of global governance	16.8.1 Proportion of members and voting rights of developing countries in international organizations (same indicator as 10.6.1)	This global indicator is defined as the percentage of members (or voting rights) in international organizations that are (or belong to) developing countries. For institutions where membership and voting rights are different, this indicator observes the percentages separately.
16.9 By 2030, provide legal identity for all, including birth registration	16.9.1 Proportion of children under 5 years of age whose births have been registered with a civil authority, by age	This indicator is defined as the percentage of children under 5 years of age whose births have been registered with a civil authority.
16.10 Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements	16.10.1 Number of verified cases of killing, kidnapping, enforced disappearance, arbitrary detention and torture of journalists, associated media personnel, trade unionists and human rights advocates in the previous 12 months	-
	16.10.2 Number of countries that adopt and implement constitutional, statutory and/or policy guarantees for public access to information	-
16.a Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime	16.a.1 Existence of independent national human rights institutions in compliance with the Paris Principles	This indicator assesses the existence of independent national human rights institutions with the Principles relating to the Status of National Institutions (Paris Principles), which were adopted by the General Assembly (resolution 48/134) based on the rules of procedure of the Global Alliance of National Human Rights Institutions (GANHRI, formerly the International Coordinating Committee of National Institutions for the Promotion and Protection of Human Rights or ICC).
16.b Promote and enforce non-discriminatory laws and policies for sustainable development	16.b.1 Proportion of population reporting having personally felt discriminated against or harassed in the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law (same indicator as 10.3.1)	-

Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

Finance		
17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection	17.1.1 Total government revenue as a proportion of GDP, by source	This indicator is defined as the share of total central government revenue expressed as a proportion of the GDP.
	17.1.2 Proportion of domestic budget funded by domestic taxes	This indicator is defined as the percentage of domestic budgetary central government expenditure that is funded by tax revenue.

Goals and targets	Indicators	Definition of indicator
17.2 Developed countries to implement fully their official development assistance commitments, including the commitment by many developed countries to achieve the target of 0.7 per cent of gross national income for official development assistance (ODA/GNI) to developing countries and 0.15 to 0.20 per cent of ODA/GNI (gross national income) to least developed countries; ODA providers are encouraged to consider setting a target to provide at least 0.20 per cent of ODA/GNI to least developed countries	17.2.1 Net official development assistance, total and to least developed countries, as a proportion of the OECD Development Assistance Committee donors' gross national income (GNI)	This indicator is defined as the percentage of the gross national incomes of the OECD Development Assistance Committee's (DAC) donor members that is disbursed as official development assistance to all developing countries and least developed countries.
17.3 Mobilize additional financial resources for developing countries from multiple sources	17.3.1 Foreign direct investment, official development assistance and South-South cooperation as a proportion of total domestic budget 17.3.2 Volume of remittances (in United States dollars) as a proportion of total GDP	- -
17.4 Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress	17.4.1 Debt service as a proportion of exports of goods and services	-
17.5 Adopt and implement investment promotion regimes for least developed countries	17.5.1 Number of countries that adopt and implement investment promotion regimes for least developed countries	-
Technology		
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	17.6.1 Number of science and/or technology cooperation agreements and programmes between countries, by type of cooperation 17.6.2 Fixed Internet broadband subscriptions per 100 inhabitants, by speed	- This indicator is defined as the number of fixed internet broadband connections/subscriptions of different speed tiers per 100 inhabitants of a country. The speed tiers considered are advertised downstream speeds of: (1) 256 Kilobits per second (Kbps) to 2 Megabits per second (Mbps), (2) 2 Mbps to 10 Mbps, and (3) Greater than 10 Mbps.

Goals and targets	Indicators	Definition of indicator
17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed	17.7.1 Total amount of approved funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound technologies	-
17.8 Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology	17.8.1 Proportion of individuals using the Internet	This indicator is defined as the percentage of people who have used the internet from any location in the last three months, using any internet-capable device
Capacity-building		
17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation	17.9.1 Dollar value of financial and technical assistance (including through North-South, South-South and triangular cooperation) committed to developing countries	-
Trade		
17.10 Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade Organization, including through the conclusion of negotiations under its Doha Development Agenda	17.10.1 Worldwide weighted tariff-average	-
17.11 Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020	17.11.1 Developing countries' and least developed countries' share of global exports	-

Goals and targets	Indicators	Definition of indicator
17.12 Realize timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries, consistent with World Trade Organization decisions, including by ensuring that preferential rules of origin applicable to imports from least developed countries are transparent and simple, and contribute to facilitating market access	17.12.1 Average tariffs faced by developing countries, least developed countries and small island developing States	-
Systemic issues		
Policy and institutional coherence		
17.13 Enhance global macroeconomic stability, including through policy coordination and policy coherence	17.13.1 Macroeconomic Dashboard	-
17.14 Enhance policy coherence for sustainable development	17.14.1 Number of countries with mechanisms in place to enhance policy coherence of sustainable development	-
17.15 Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development	17.15.1 Extent of use of country-owned results frameworks and planning tools by providers of development cooperation	This indicator measures the extent to which, and the ways in which, all concerned development partners use country-led results frameworks (CRFs) to plan development cooperation efforts and assess their performance.
Multi-stakeholder partnerships		
17.16 Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries	17.16.1 Number of countries reporting progress in multi-stakeholder development effectiveness monitoring frameworks that support the achievement of the sustainable development goals	This indicator tracks the number of countries reporting progress in multi-stakeholder monitoring frameworks that track the implementation of development effectiveness commitments supporting the achievement of Sustainable Development Goals.
17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships	17.17.1 Amount of United States dollars committed to (a) public-private partnerships and (b) civil society partnerships	-
Data, monitoring and accountability		

Goals and targets	Indicators	Definition of indicator
<p>17.18 By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts</p>	<p>17.18.1 Proportion of sustainable development indicators produced at the national level with full disaggregation when relevant to the target, in accordance with the Fundamental Principles of Official Statistics</p>	-
	<p>17.18.2 Number of countries that have national statistical legislation that complies with the Fundamental Principles of Official Statistics</p>	-
	<p>17.18.3 Number of countries with a national statistical plan that is fully funded and under implementation, by source of funding</p>	<p>The indicator is defined as the number of countries with a national statistical plan that is fully funded and under implementation, as reported in the annual status reports on National Strategies for the Development of Statistics.</p>
<p>17.19 By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries</p>	<p>17.19.1 Dollar value of all resources made available to strengthen statistical capacity in developing countries</p>	<p>This indicator is defined as the total US dollar value of all resources that are made available to strengthen statistical capacity in developing countries. It is based on the Partner Report on Support to Statistics (PRESS) which are designed and administered by PARIS21.</p>
	<p>17.19.2 Proportion of countries that (a) have conducted at least one population and housing census in the last 10 years; and (b) have achieved 100 per cent birth registration and 80 per cent death registration</p>	-
		<p>- = no definition available in e-Handbook</p>

