

Annex 29. Environment Statistics Background

1. A Framework for the Development of Environment Statistics (FDES) was first published in 1984 by the United Nations Statistics Division (UNSD), along with its subsequent publications, Concepts and Methods of Environment Statistics: Human Settlements Statistics³ (1988) and Concepts and Methods of Environment Statistics: Statistics of the Natural Environment⁴ (1991). The 1984 FDES and subsequent publications have been a useful framework for guiding countries in the development of their environment statistics programmes. Since its publication there have been many scientific, political, technological, statistical and experience-based developments which suggested that the FDES was ready for revision.
2. As a consequence, the United Nations Statistical Commission, at its 41st session (23-26 February 2010), endorsed a work programme and the establishment of an Expert Group for the revision of the FDES and the development of a Core Set of Environmental Statistics. The members of the Expert Group represented producers and users of environment statistics of countries from all regions and at different stages of development, as well as international organizations, specialized agencies and non-governmental organizations.
3. The revision was based on an agreed set of criteria and has been supported by extensive international expert consultation. The 1984 FDES was used as the starting point. It was revised taking into account the lessons learned during its application in different countries as well as improved scientific knowledge about the environment. The revision has also taken into account the increasing prominence of environmental sustainability and sustainable development issues and concepts. Existing environment statistics and indicator frameworks were analyzed, including major developments in the field of environmental-economic accounting and selected thematic developments pertinent to environment statistics

Finally, the new text was approved by the UN Statistical Commission in 2013

4. The FDES 2013 is a multi-purpose conceptual and statistical framework that is comprehensive and integrative in nature. It marks out the scope of environment statistics and provides an organizing structure to guide their collection and compilation and to synthesize data from various subject areas and sources. It is broad and holistic in nature, covering the issues and aspects of the environment that are relevant for analysis, policy and decision making (FDES 2013, para. 1.9).
5. The FDES 2013 is structured in a way that allows links to economic and social domains. It seeks to be compatible with other frameworks and systems, both statistical and analytical, such as the System of Environmental-Economic Accounting (SEEA), and the sustainable development indicator frameworks. It is based, when applicable, on existing statistical classifications. As such, the FDES facilitates data integration within environment statistics and with economic and social statistics (FDES 2013, para. 1.11).

As stated in FDES 2013, there are six constituents' components of environment statistics:

- 1.Environmental Conditions and Quality
- 2.Environmental Resources and their Use
- 3.Residuals
- 4.Extreme Events and Disasters
- 5.Human Settlements and Environmental Health
- 6.Environment Protection, Management and Engagement

Only a few of them include tourism related topics:

- 2. The Environmental Resources and their Use component include *land use* as well as *use and returns of water*
- 3. Residuals include *emissions to air* and *generation of waste*
- 5. Human Settlements and Environmental Health include *urban and rural population, access to water* and *housing conditions*

Of all of these topics, only those included in the Residuals component have not been addressed in this document under the research area *Guidance related to "Tourism and the environmental dimension, non-economic contributions and impacts"* (basically because they have been extensively addressed by UNWTO in the past); the rest are linked to the following topics (see [1.7/Box1](#)):

- General Background on Tourism and the environmental dimension (topic 7)
- The consumption of water (topic 8)
- Tourism and rural economy development (topic 9)

6. Given the statistics nature of the present document, the approach to these three topics cannot be but finding the tourism connection to FDES 2013 conceptual framework; the next paragraphs address the set of issues particularly relevant in relation to that connection:
 - Human settlements
 - Cross cutting issues
7. As previously mentioned, environment statistics background insist once and again on the need for developing integrated information systems; consequently, terms as "integrated data", "multi-dimensional", "cross-cutting issues", etc. appear systematically all along this and the following sections.

Human settlements

8. As indicated in paragraphs 5.129 and 5.130, measurement of water use and rural/urban development as a proxy to poverty needs to focus on data integration and a multi-purpose approach as recommended by UN in the new international statistical standards already mentioned in previous sections; consequently, the focus on how tourism could contribute to poverty alleviation should not be on individuals but on human settlements.
9. UNWTO has been working during the last years on poverty alleviation focusing mainly on the rural population; nevertheless, given UN forecasts for the next years on population growth data, it would seem necessary to associate the eradication of poverty to the certitude that almost 75% of the world population will be living in urban settlements.

In any case, regarding the measurement of the target population of poverty alleviation initiatives FDES2013 component 5 "Human Settlements and Environmental Health" contains statistics on the environment in which humans live and work, particularly with regard to living conditions and environmental health. These statistics are important for the management and improvement of conditions related to human settlements, shelter conditions, safe water, sanitation, and health, particularly in the context of rapid urbanization, increasing pollution, environmental degradation, disasters, extreme events, and climate change. (FDES 2013, para 3.214)

The sub-component "Human settlements" refer to the totality of the human community, whether people live in large cities, towns or villages. They refer to the human population that resides in a settlement, the physical elements (e.g., shelter and infrastructure),

services (e.g., water, sanitation, waste removal, energy and transport), and the exposure of humans to potentially deleterious environmental conditions. (FDES 2013, para. 3.194)

Statistics on human settlements are required by policy makers, analysts and civil society in order to inform on how humans live and work in these settlements, how they transform the landscape and the supporting ecosystems, and in turn how this affects human wellbeing and health. The extent of human settlements, their ecological footprint (which is closely related to prevailing production and consumption patterns), the supporting and nearby environmental conditions and quality, as well as human access to infrastructure and services, all affect both humans and the environment in a cyclical and iterative way. (FDES 2013, para 3.195)

The type of sources that are needed to document the state and changes in human settlements include censuses, surveys, administrative records, and remote sensing. Institutional partners of the NSO include housing and urban planning authorities, health and transportation authorities, as well as research institutions. Presenting the statistics spatially using maps and geospatial statistics adds important value to the information being produced. (FDES 2013, par 3.196)

Cross-cutting issues

10. The FDES 2013 is a framework which organizes the domain of environment statistics into six components which are further broken down into sub-components and statistical topics. The statistical topics in the FDES, and the underlying environment statistics in the Core Set of Environment Statistics and the Basic Set of Environment Statistics, can be combined and reorganized in different ways according to specific analytical needs and policy requirements. This is an inherent aspect of the design of the FDES 2013 as a flexible multi-purpose framework. (FDES 2013, para.5.1)
11. When compiling environment statistics on a particular cross-cutting issue, it is important to start by first understanding the scientific background, underlying processes and cause-effect relationships. It is also necessary to analyze and understand its relevance to the country and to particular sub-national areas, productive sectors and social groups, its national policy implications and commitments, as well as the institutional aspects and the international context. (FDES 2013, para.5.3)
12. The cross-cutting issues of water, energy, climate change and agriculture are examples and should be considered illustrative applications of selected cross-cutting issues. The FDES2013 users might wish to develop other analyses of cross-cutting issues for specific purposes, according to national relevance and needs (e.g., sustainable management of natural resources, or environmental impacts of specific activities such as tourism, transport, poverty, mining, manufacturing, etc.). (FDES 2013, para.5.4)

E.1. The consumption of water

Water as a cross-cutting issue

13. Water is fundamental to every form of life and plays a critical role in human development. It is critical both in terms of quantity and quality. (FDES 2013, para.5.6)
14. Water use and returns affect the environment in different ways. If water is abstracted faster than its natural replenishment, the resource can be depleted and even exhausted. Water abstraction itself affects the environment by decreasing, at least momentarily, the

available water for other purposes including key ecological functions. Distribution losses also can cause inefficiency and require higher amounts to be extracted. When the water is used and then returned to the environment, quality and pollution become the major problems. Returns of water can either be treated or not, and to different extents, so when it is returned it has the potential to adversely affect the environment. (FDES 2013, para.5.9).

15. Protecting the quality of freshwater is important for ecosystems, drinking water supply, food production and recreational water use. (FDES 2013, para.5.10)
16. The Rio+20 United Nations Conference on Sustainable Development (20-22 June 2012) provided the context for the pivotal role of water. It noted in its outcome document that water was “at the core of sustainable development”, through its link to key global challenges such as poverty eradication (FDES 2013, para.5.13)

Statistical approach

17. FDES Component 2. Environmental Resources and their Use is closely related to the asset and physical flow accounts of the SEEA Central Framework on which, where relevant, the terms and definitions are based. Environmental resources (or assets as they are referred to in the SEEA Central Framework) are the living and non-living constituents of the earth together comprising the biophysical environment that may provide benefits to humanity. Environmental resources include: subsoil resources (non-energy and energy minerals); land; soil resources; biological resources; and water resources. They can be naturally renewable (e.g., fish, timber or water) or non-renewable (e.g., minerals). (FDES 2013, para.3.73)
18. Environmental resources are used as important inputs in production and consumption. They contribute to the provision of shelter, food, health care, infrastructure, communications, transportation, defense and virtually every other aspect of human activity. Consequently, statistics documenting their availability and quality over time are necessary for policy makers to make informed decisions. (FDES 2013, para.3.74)
19. Regarding water, such environmental resource is abstracted from surface and groundwater resources by economic activities and households. Water can be abstracted for own use or for distribution to other users. Statistics on water abstraction are usually available from administrative records (monitoring of actual water abstractions as well as abstraction permits). (FDES 2013, para.3.133)
20. After abstraction and distribution water is used in the economy in production and consumption activities. Water can be recycled and reused several times before returning it to the environment. Water use should be disaggregated according to economic activity and household use. Statistics on water use can be obtained from statistical surveys of primary users, household surveys and administrative records of the water supply industry. (FDES 2013, para.3.134)
21. In-stream water use refers to the use of water in situ, without abstracting it from its source. Examples of in-stream water use are transportation, hydropower generation, fishing, recreation and tourism, and waste loading (pollution dilution). In-stream activities are usually measured in terms of the intensity of the use. Statistics on water transport, tourism and recreation can be used to indicate the pressures these activities put on water resources. (FDES 2013, para.3.135)

22. All economic activities and households can abstract, use and return water to the environment with or without treatment (FDES 2013, para.3.153)

This reference deserves particular attention because household access to natural resources as well as “spatial analysis” (like rural/urban –see [previous section A / Tourism and the Environmental Dimension: General Background](#)) opens the door for multi-dimension analysis on water but also on other topics such as poverty (associated with the objective of fostering rural economy development an issue that will be discussed in next [Section E.2.](#))

23. Integrated data, including social, economic and environmental accounts based on agreed classifications and methods, are important in efforts to help countries design effective sustainable development and other cross-cutting policies. Comparable data over time and across countries are needed to track performance across a range of sustainable development related goals and objectives, including, for example the Sustainable Development Goals.

As previously mentioned (see [para.3.16](#)), the proposal for gathering a basic set of no more than 15 statistical data and indicators at subnational levels includes the use of water

B. Tourism and sustainable development:

B.1. Tourism and the environmental dimension

B.1.1 Urban drinking water consumption due to tourism –m3- (Annual)

Administrative records (either from the water suppliers or the municipal authorities) seem to be the proper source for such data as for most of environmental type indicators proposed.

24. UN-Water is the United Nations (UN) inter-agency mechanism for all freshwater and sanitation related matters. It provides the platform to maximize system-wide coordinated action and coherence and serves UN Member States in their efforts towards achieving development goals related to freshwater and sanitation.

In the new Sustainable Development Goals (SDG) agenda post-2015 includes a global goal for water: *securing sustainable water for all*.

The former Millennium Development Goals (MDGs) launched during 2000/2015, did not address the full water and development agenda, nor fully recognized its synergies with other areas and concerns. Emphasis on “sustainability” was not included and human rights and inequalities were also largely ignored in the MDG framework. Subsequently, member states have agreed that human rights, equality and sustainability should form the core of the development agenda and be recognized as critical for true development.

25. Water’s fundamental importance for human development, the environment and the economy needs to feature prominently in the new post-2015 development agenda.

Such global goal aims to support the protection of water resources from over exploitation and pollution while meeting drinking water and sanitation needs, energy, agriculture and other uses.

26. Such goal builds on and extends existing commitments: it is fundamental to all other development goals and the proposed framework works for all countries. The targets for the goal for water have important explicit and implicit interlinkages, making them mutually supportive. For example, access to drinking water and ensuring it is fairly shared requires good governance, balancing competing demands, and the protection of natural

supply systems from pollution and water-related disasters. Furthermore, the goal for water and its targets is of direct importance to addressing other proposed areas within the post-2015 framework, such as health, energy, food, employment, gender equality and environmental sustainability.

27. These UN Water suggestions recognize that water needs both a goal in its own right and consideration in the formulation of other goals. Water is much more than a cross-cutting issue - unless the fundamental role of water and the water issues raised in this proposal can be resolved, other important elements of the new development agenda will be unachievable. Water and water infrastructure is a vital part of the foundations for sustainable development, poverty alleviation and human well-being.
28. One of such targets (“achieve universal access to safe drinking water, sanitation and hygiene”) includes the reference to “households, schools and health facilities”; as mentioned in [chapter 2](#), INRouTe proposes that also the consumption of drinking water by visitors should be measured estimating the tourism population in those regions and other sub-regional territorial entities where tourism is significant. It would be probably the only way to use a robust estimate for national figures as required by post-2015 initiative.
29. Also complementary initiatives on water consumption due to the tourism sector at the subnational level could include estimates of golf courses and other tourism related infrastructures.
30. Data to monitor progress on the SDG’s post-2015 global goal for water focuses exclusively on the national level and most of them are based on country level household surveys and other nationally collected data.
31. Nationally representative household surveys are currently the main source of data used for developing countries while regulatory data is used in a smaller number of developed countries. It is expected that household surveys will remain a major source of data for global monitoring in the short term, with regulatory data becoming increasingly important after 2015.
32. As previously mentioned, an indicator on water consumption at subnational levels (see 4.19) is proposed to be developed using administrative records (either from the water suppliers or the municipal authorities) which are envisaged as the proper source for such data as for most of environmental type indicators proposed. At the national level it might happen that the use of household surveys as proposed by the UN SDG development agenda could be the proper source for assessing the overall objective but progress made on a temporal basis might also be supported by administrative records associated to the provision or payment of water provision.

E.2. Tourism and rural economy development

33. As already mentioned expanded SEEA indicators should help capture and inform the multi-dimensional poverty and environment nexus. Poverty may be linked to environmental conditions and often the poor and vulnerable groups rely on the environment for their livelihoods and well-being.

In fact, SEEA conceptual background looks for a multi-dimensional approach in which spatial disaggregation (such as the rural and non-rural areas) and poverty are predominant in relation with understanding how tourism can contribute to poverty eradication instead of using other approaches such as tourism and rural economy

development. The following paragraphs are extracted from the System of Environmental Economic Accounting 2012 / Applications and Extensions (SEEA_AE).

34. Given the many different factors influencing well-being, livelihoods, and sustainable development, no single indicator, such as income or other financial data, can reflect the multiple aspects of poverty, deprivation, and links to the environment. The multiple dimensions of poverty link to the environment and the economy in many ways. These links include empowerment, inclusion, health, education, living standards, environmental degradation, ecosystem services, income, employment, food, water, sanitation, energy, safety, and access to basic services and infrastructure. (SEEA_AE para. 4.25).
35. The main areas in which SEEA might be extended to capture relevant information relate to data on stocks and flows of water resources and energy resources. These two types of resources are central to the operation of well-functioning households and communities in all parts of the world. The extension of most direct relevance is likely to be a breakdown of household consumption of water and energy by household income. (SEEA_AE para. 4.26).
36. The types of breakdown that are applied will depend on the analytical interest and data availability. There may be interest in decomposing information on household consumption of energy and water use by purpose, i.e. differentiating energy used for heating, cooking, transportation or water used for washing, cooking, bathing, etc. Alternatively, there may be interest in decompositions that aid in the study of equality and development. In this case data that differentiates urban and regional areas, special population groups (e.g., the elderly, families with young children, specific ethnic groups) or household consumption and activity by income, may be relevant. (SEEA_AE para. 4.27).
37. Extensions in terms of spatial disaggregation is of particular importance; in fact, the first topic in this sub-component covers urban and rural population which highlights that humans live in either rural or urban communities, building their shelters and institutions, while using environmental resources to satisfy human needs. Depending on the carrying capacity of ecosystems, these settlements and their use of environmental resources will affect environmental conditions, as well as human wellbeing and health. (FDES 2013, para.3.197)
38. Statistics on the location of human settlements can be found both in traditional demographic statistics, and increasingly in geospatial information sources. The potential for the use of georeferenced population data in the field of environment statistics is ample. They can be used not only as a reference but also in combination with other environment statistics to construct indicators. For instance, in combination with housing, water and sanitation statistics, they can provide telling determinants of the environmental sustainability of human settlements and environmental health. (FDES 2013, para.3.199)
39. The main statistics pertaining to this topic are rural, urban and total population, including population density. When possible, these statistics should include geospatial information regarding specific geographic distributions in the country. Data availability is ample for this topic in most countries, the main source being both population censuses and household surveys. These statistics are generally produced by NSOs, usually in the demographic or social domains. (FDES 2013, para.3.200)
40. The following examples gathered by UNWTO for the Second T.20 Ministers Meeting / Republic of Korea, 11-13 October 2010, illustrate that tourism seems to be a growing economic alternative for the economic viability of rural regions:
 - The fact that Japan has historically developed Provincial Input-Output Tables has allowed for particular research on tourism economic impacts at subnational levels:

- one of such findings is that domestic tourism counts for a greater positive impacts in rural areas than inbound tourism (Miyagawa, 2011)
- In Canada it has been documented that the intensity of tourism employment in predominantly rural regions is about the same as in urban areas
 - Several countries argue that tourism has been helpful in dealing with poverty in economically lagging, especially rural regions. China states that “in recent years, tourism has played a key role in tackling poverty by providing job opportunities to the surplus labour force in the underdeveloped areas of China”. Indonesia and Turkey note similar experiences where the latter, as well as Mexico, maintains that tourism provides opportunities for low-skilled labour. Following Indonesia’s argument that “poverty is related to the lack of skills”, one may deduce that accompanying tourism jobs with training for skills development may thus be a way to boost the mitigation effect on poverty.
 - These examples point out that the way tourism contribute to poverty alleviation is through visitor’s expenditure impact on local population income; for the purpose of proper measurement of such impacts, there is the need for precise definition of the target population. In this perspective, it seems relevant the distinction between unskilled jobs and poor: while in the first case we are focusing on individuals employed that receive an income, in the second case the focus is on households which income is under the poverty line
41. In each case observation instruments (in the first case mainly administrative records while in the second case household surveys) oblige to find the connection between visitor /travel party / household (see [Chapter 6](#))
42. Finally, UN General Assembly has formally accepted (November 2014) that tourism can contribute to “poverty eradication and environment protection” stressing two relevant issues in line with this chapter:
- “Poverty is a multifaceted problem that requires a multifaceted and integrated approach in addressing its economic, political, social, environmental and institutional dimension at all levels”
 - “The role of sustainable tourism, including ecotourism, in promoting rural development and better living conditions for sustainable rural populations”