FRAMEWORK FOR THE DEVELOPMENT
OF ENVIRONMENT STATISTICS (FDES 2013)

MANUAL ON THE BSES: COMMENTS ON CHAPTERS

Session One: Environment Statistics Toolbox

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Methodology Sheet
Air Quality Statistics

Topic 1.3.1 Air Quality

Air Quality: 2. Introduction/Relevance

- Structure: to be adjusted to cover common structure of importance, environmental issues, climate change issues, policy needs, impacts, relation to other Components.
- Mention the Kyoto Protocol and the Paris Agreement ? – these address emission reduction targets not concentrations but Topics 1.3.1 and 3.1.1 are related
- Mention Stockholm and Minamata Conventions
- Expand national monitoring network from urban to include suburban and rural areas.
- Explain relation between emissions and concentrations. Include discussion on safe levels of emissions which can be absorbed and levels of concentration above normal

Air Quality: 3. Definitions and description of the statistics

- **Air pollution standards**: *"primary, secondary, latent zones, saturated zones."*
  - This is a US EPA standard. Is this internationally acceptable?
  - EU has a different standard. What is the WHO guideline/standard?
- **Local air quality**: "*sources of air emissions, point sources, non-point sources, on-road sources, non-road sources.*"
  - This mixes location (point/non-point) with sources (on-road, off-road)
  - Is this used internationally? Why is road a main source?
  - How are these related to the concentrations? E.g., ozone is not related to local air quality – it is not a very short life time pollutant and it is not directly emitted into the atmosphere.

Air Quality: 3. Definitions and description of the statistics

Concentration level of particulate matter (PM_{10}) (FDES 1.3.1.a.1)

- *"Inhalable coarse particles"* - is coarse particles the correct term?
- Average concentrations (mobile 24-hour, daily and annual): Can be reported hourly, but are normally aggregated to daily or running 24-hours because the short-term standards are daily values.
- Footnote: *"One of the most used standards is the temperature of 293.15 K and a pressure of 1atm (National Institute of Standards and Technology, NIST)"* – is this internationally accepted?
- WHO standards: correct terminology is WHO Guidelines

Air Quality: 3. Definitions and description of the statistics

Concentration level of particulate matter ($PM_{2.5}$) (FDES 1.3.1.a.2)

- *"Reported as mobile 24-hour, daily and annual":* Can also be reported hourly
- EEA standard is EEA as 99th percentile (3 days/year).

Concentration level of tropospheric ozone (O_3) (FDES 1.3.1.a.3)

- Anthropogenic and natural "ozone molecule", is not a necessary distinction. Can say that sources can be either anthropogenic or natural.
- *"Reported as concentrations over 8 hours in the air":* mainly reported as hourly values, then integrated into running 8-hour values to relate to the standards.

Air Quality: 3. Definitions and description of the statistics

Concentration level of carbon monoxide (CO) (FDES 1.3.1.a.4)

- *"Reported 1 hour or over 8 hours in the air":* also reported for 15 and 30 minutes

Concentration level of sulphur dioxide (SO_2) (FDES 1.3.1.a.5)

- *"Reported over minutes , twenty-four hours, and annual average concentrations in the air":* also reported also for hours

Air Quality: 3. Definitions and description of the statistics

Concentration levels of heavy metals (FDES 1.3.1.a.7)

- WHO air quality guidelines: What is the reference here? The Guidelines title did not include lead
  - EEA: Please check the AQ Guidelines for Europe (http://www.euro.who.int/__data/assets/pdf_file/0005/74732/E71922.pdf)

Concentration levels of non-methane volatile organic compounds (NMVOCs) (FDES 1.3.1.a.8)

- Is the US Standard generally accepted? Some explanation is needed for why a national standard is used.

Air Quality: 4. International sources and recommendations

U. S. EPA air pollutant groups: *criteria air pollutants, greenhouse gases and hazardous air pollutants*

WHO groups: *local, urban, regional, hemispheric and global scales*

- Are these groups classifications or should they be otherwise titled?

International statistical recommendations, frameworks and standards

  - Should regional, national sources or NGOs be used? If so what are the particular guidelines? Only general websites mentioned.
- Other possible indicators which can provide a more comprehensive picture

Air Quality: 5. Transforming data into environment statistics

- Should section be refocused from primary data collection.
- What are some sources for spatial aggregation? i.e., should data be provided data by monitoring station; how to create interpolation maps, and how regional summaries are created e.g., see UK-Air website https://uk-air.defra.gov.uk/latest/;
- How are monthly and yearly aggregations created.
- Study objective – noted that geographical coverage of city too limited – also AQ zone, region, country also relevant.
  - City is related to US legislation
- What are additional data sources from administrative records or special studies?
- Information on how data on air quality can be reconciled if there are various sets of data being generated by different agencies from various reporting forms?

Methodology Sheet
Waste Statistics

Topics 3.3.1 Generation of waste and Topic 3.3.2 Management of waste

Waste Statistics: 2. Introduction/Relevance

- Waste management, collection and treatment should be separate sections
- Manual should be more explicit about which practices countries should follow and include more best practices from African countries, with case examples
  - *International waste statistics is not at a state where a consensus has been achieved*
- More elaboration is needed on the FDES statistics compared to the general background with examples
  - *Every FDES statistic is defined and elaborated*
  - *Handbook of waste statistics planned covering case studies*

Waste Statistics: 2. Introduction/Relevance

- Mention that more information on intermediate/pre-treatment is needed as well as final treatment. Secondary waste leads to issues of generated waste differing from treated waste. Waste should be followed through the entire waste management system to understand options for a circular economy
- Amount of waste generated remains a problem in OECD countries – this should be communicated
- Include some recent policy concerns such as e-waste in developed and developing countries
- Relation of ECE Task Force on Waste to FDES to be made clearer

Introduction Figure 2.2 Product lifecycle in circular economy and relation to waste

- Amend diagram to better distinguish between formally managed, informal and illegal - and to relate it to the terms "controlled waste" and "uncontrolled waste“
- Striped pattern for informal activities is not very clear and that these are activities where both informal and managed act is not clear
- Illegal activities should be part of the diagram.
- 3. Uncontrolled can have an "informal" and an "illegal" component.
- 4. "Generation of new products" could be part of "prevent and reduce resources used".

Waste Statistics: 3. Concepts in Waste Statistics

3A. Issues of waste statistics

- Waste management, waste collection and treatment have been used together of which collection and treatment is part of waste management. This may confuse users.
- Issues of internationally comparable waste statistics and challenges to produce national waste statistics should be separated
- Include need to develop metadata on waste statistics to avoid misuse and interpretation of waste data.
- Management of waste – a stronger elaboration has been provided, including relation to collection, treatment and disposal; and informal and illegal activities

Waste Statistics: 3. Concepts in Waste Statistics

3C. Waste categories and groupings:

- Examples of lists of aggregates used in African countries would improve the coverage and relevance of the manual

3D. Composition of waste

- To include components of waste not covered in the OECD/Eurostat questionnaire which are relevant, for example wood or hazardous waste

Waste Statistics: 3. Concepts in Waste Statistics

3E. Waste treatment and disposal

- Pre-treatment should be a separate category – items under Other 3E1 apply
- Elaborate on limitations of not including pre-treatment as does not fully capture flows of waste and why international questionnaires do not include this fully
- Distinguish between final treatment and final disposal; and main treatment

Waste Statistics: 3. Concepts in Waste Statistics

- **3G. Imports and exports of waste generated, waste collected and waste treated**
  - 3G1 Eurostat practice: “Waste statistics need to include imports and exports in the totals.” Also include that this is the opposite for municipal waste statistics.

Waste Statistics: 3. Concepts in Waste Statistics

4B. Management of waste: municipal waste (Topic 3.3.2)

- 4B1. Municipal waste: United Nations Statistics Division/United Nations Environment Programme Questionnaire 2016 on Environment Statistics
  - Explain why municipal sewage network and treatment, municipal construction and demolition waste is excluded

Waste Statistics: 4. Definitions and description of the statistics

4A. Generation of waste (Topic 3.3.1)

Amount of municipal waste generated is needed.

This is included in 3.3.1.b Amount of waste generated by waste category

Amount of Hazardous waste generated (3.3.1.c)

- This should be disaggregated by waste type

Waste Statistics: 4. Definitions and description of the statistics

4B. Management of waste: municipal waste (Topic 3.3.2)

Amount of municipal waste treated by type of treatment and disposal (FDES 3.3.2.a.2)

- Remarks can be moved to 3E on Waste treatment and disposal as they are definitional

Number of municipal waste treatment and disposal facilities (3.3.2.a.3) and Capacity of municipal waste treatment and disposal facilities (3.3.2.a.4)

- Should include pre-treatment facilities, i.e., sorting and mechanical-biological treatment plants. Recycling in production plants (e.g. paper mills, steel plants etc.) after sorting and pre-treatment. Facilities for preparing for reuse (sorting, cleaning, testing, repair, remanufacturing).

Capacity of municipal waste treatment and disposal facilities (FDES 3.3.2.a.4)

- Same remarks as under number of facilities – double check they apply to both statistics

Waste Statistics: 4. Definitions and description of the statistics

4C. Management of waste: hazardous waste (Topic 3.3.2)

Number of hazardous waste treatment and disposal facilities (3.3.2.b.3) and Capacity of hazardous waste treatment and disposal facilities (FDES 3.3.2.b.4)

- Same as municipal on types of facilities to be included
- Capacity of co-incineration plants: when reporting about the capacity, it should not be the total capacity of the plant (e.g. tons of cement) but the capacity of waste that is permitted to be co-incinerated.
- Should include pre-treatment facilities (sorting, MBT)
- Distinguish between sorting and pre-treatment facilities, recycling facilities and preparing for reuse

Waste Statistics: 4. Definitions and description of the statistics

4C. Management of waste: Other/industrial waste (Topic 3.3.2)

Number of other/industrial waste treatment and disposal facilities (3.3.2.c.3) and Capacity of other/industrial waste treatment and disposal facilities (FDES 3.3.2.c.4)

- Same as municipal on types of facilities to be included

4G. Imports and Exports

Imports of waste (FDES 3.3.2.e) Exports of waste (FDES 3.3.2.f

- Issue of illegal exports of waste to be addressed

Waste Statistics: 5. International sources and recommendations

5A. Classifications and groupings: *5A1. Classification of economic activity*

- Explain why **excluding** *ISIC Division 38 on Waste collection, treatment and disposal activities; materials recovery* ***AND*** *Section T on activities of households as employers; undifferentiated goods- and services-producing activities of households for own*

Methodology Sheet
Natural Extreme Events and Disasters

Sub-component 4.1 Natural Extreme Events and Disasters

General

- How are droughts considered?
- Are infectious diseases considered causes?
- Are houses damaged (of households) considered as economic impact of disasters?
- Direct effect of disaster is easier to consider than indirect effects as the latter varies by country
- Is there an option to merge the manual with that on technological disasters as many concepts are similar?
  - Continue with planned publication but amend with technological disasters.

3. Definition and Description of Statistics

- Natural disaster - the term disaster should be defined in line with the Sendai Framework and natural disaster added as *Disaster caused from a Natural Hazard.*
- Exposure – definition could be expanded "Exposure is the situation of people, infrastructure, housing, production capacities and other tangible human assets <u>being unprotected and open to a hazard.</u>"
  - What is the relation to vulnerability and sensitivity (the degree to which a system or species is affected, either adversely or beneficially, by climate variability or change (IPCC, 2014))?

3. Definition and Description of Statistics

- Duration (FDES 4.1.1.a.5) – how to define the duration - the example given of droughts or heat-waves can be expanded, e.g., if the daily temperature goes over a climatological threshold for more than 3 consecutive days, with the threshold varying by location.

5. Data Collection and Sources of Data

- Unit of measurement – should this be the hazardous events and disasters, because this is what is measured.

Methodology Sheet
Soil Characteristics Statistics

Topic 1.1.4 Soil Characteristics

Soil Characteristics: 2. Introduction/Relevance

- Structure: to be adjusted in line with other manuals: importance, environmental issues, climate change issues, policy needs, relation to other components.
- Ensure that impacts on soil from erosion and pollution are mentioned
- UNSD will consult the UNCCD Global Land Outlook 5th Edition to include some materials for the introduction.

Soil Characteristics: 3. Definitions and description of the statistics

Soil degradation (FDES 1.1.4.b)
Include UNCCD land degradation? *"Land degradation means reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as:*
(i) soil erosion caused by wind and/or water;
(ii) deterioration of the physical, chemical and biological or economic properties of soil; and
(iii) long-term loss of natural vegetation;"

The indicator SDG 15.3.1: land degraded over total land area: calculates the proportion of degraded soils in countries from 3 sub-indicators, according to the UNCCD metadata.

In this context is land degradation broader than soil degradation?

Soil Characteristics: 3. Definitions and description of the statistics

Area affected by soil erosion (FDES 1.1.4.b.1)

- Should UNCCD be also included and in what way?
- Remarks to be expanded as soil erosion should not be confused with soil degradation which is a broader concept, however, *erosion is one type of degradation*

Area affected by desertification (FDES 1.1.4.b.2)

- Should UNCCD be included and in what way?
- "Desertification statistics should be disaggregated into: light desertification, moderate desertification, severe desertification and extreme desertification" These categories light, moderate, etc. are normally used for referring to soil degradation. Is this appropriate also for desertification? Is there a source?

Affected area by Salinization 1.1.4.b.3 and Calcium (FDES 1.1.4.c.3)

- Calcium is mentioned as both causing and reducing salinization – to be corrected or elaborated
- Affected area by salinization – add mention of effects as a with other statistics, e.g.,

impact on biodiversity and for salinization it increases the osmotic pressure, and the toxicity of plants due to accumulation of Na+ and degradation of agriculture and biodiversity

Soil Characteristics: 3. Definitions and description of the statistics

- **Area affected by acidification (FDES 1.1.4.b.5** To include effects of acidification: acidification can be natural or anthropogenic, it decreases the biological activities and the weakens forest ecosystems
- **Phosphorous (FDES 1.1.4.c.2)** To include in the effects: excessive of phosphorus causes the eutrophication (proliferation of aquatic water) of water.
- **Calcium (FDES 1.1.4.c.3)** To include effects: has an impact on soil stability, PH, the mobility of K^{+} and maintain the PO_4^{3+} in assimilable form
- **Potassium (FDES 1.1.4.c.5)** To include affects: it allows for the growth and development of plants by cells synthesis, transport between cells, stress resistance etc.

Soil Characteristics: 3. Definitions and description of the statistics

Zinc (FDES 1.1.4.c.6) *suggested sources*

- Trace metallic element in the soil which can become contaminant and pollutant in excessive doses. It is in this case ecotoxic for some plants.
- http://www.zinc.org/crops/
- Sillanpaa, M. (1982) Micronutrients and the Nutrient Status of Soils: A Global Study. FAO Soil Bulletin No. 48, Food and Agriculture Organization, Rome

Other/Carbon (FDES 1.1.4.c.7)

- Should the definition of soil organic carbon be sourced from IPCC?

Other/Soil pH (FDES 1.1.4.c.7)

- Text of other/Soil PH and Nitrogen (FDES 1.1.4.c.1) to be reconciled, e.g., "Nutritional availability, growth and yields of most crops is optimally supported between 6 and 7 pH levels while a low pH level might lead to comparatively low growth yields."

Soil Characteristics : 4. International sources and recommendations

USDA Soil Taxonomy, Soil Conservation Service of the United States Department of Agriculture

- Do both World Reference Base for Soil Resources and USDA soil taxonomy need to be mentioned?

Soil Characteristics : 5. Transforming data into environment statistics

- Measurement units: Since the **Soil Characteristics Statistics** seem to have a spatial component, it may be useful to mention the most appropriate map scale in a new section or sub-section.
- What is the scale for **national and sub-national levels** mentioned in table 1; each scale will have a different minimum unit of measurement
- Temporal and spatial aggregation: more elaboration is needed