"Capacity Building and Strengthening Institutional Arrangement / Data Yearbook"

Workshop: "Environmental Indicators and their use for indicator-based reporting activities"

Working Group Exercise n°3

Composite Indicators.
A short review for the building of aggregated environmental indicators.

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Excercise A

To find the factor of normalization, for the followings indicators, in comparison to the context (multiple answers are admitted)

	Indicators	Unity of measure	Factor of Normalisation	Normalizated indicator *(unity of measure)*
1	Generation of the municipal wastes	Ton (t)		
2	Generation of the construction and demolition wastes	Ton (t)		
3	Separate collection of municipal wastes	Ton (t)		
4	Agricultural use of fertilizers (fertilizers and corrective)	Ton (t)		
5	Greenhouse gas Emissions (CO_2, CH_4, N_2O, HFCS, PFCS, SF_6)	Mtep of equivalent CO_2		
6	Urbanization and infrastructures	Hectare (ha)		
7	Population exposed to the noise	number of inhabitants		
8	Forest surface	Hectare		
9	Used agricultural surface	Hectare		

Excercise A

|	Indicators	Unity of measure	Factor of Normalisation	Normalisated indicator *(unity of measure)*
10	Vehicle Park	Number		
11	SOx Emissions in the chemical industry	Gram (g)		
12	Production of hazardous and non hazardous wastes (created of the productive activities)	Ton (t)		
13	Surface crossed by the fire	Hectare (it has)		
14	Quantity of Municipal wastes landfill disposal	Ton (t)		
15	Water collecting to drinkable use	Meter cube (m^3)		
16	Surface protected terrestrial areas	Hectare (ha)		
17	Surface turned to national park	Hectare (ha)		

Excercise B

Gives the followings indicators, to define if they require of a normalization or a standardization in base to the goal that is wanted to achieve

	Indicators	Unity of measure	Aim	Response
1	Generation of the Municiapal wastes	Ton (t)	Territorial comparison of the phenomenon	
2	Management of the municipal wastes	Ton (t)	Territorial comparison of the phenomenon	
3	Agricultural use of fertilizers (fertilizers and corrective)	Ton (t)	To compare the use of the fertilizers among regions	
4	Desertification	Kilometer (km)	To evaluate the desertification phenomenon in different territorial circles	
5	Air quality indicator	Micrograms/ meter^3 (μ/m^3)	To evaluate pollution phenomenon of more environmental matrixes	
6	Urbanization and infrastructures	Hectare (ha)	To compare the extension of the urbanized territory and that occupied by infrastructures present on the regional territory	
7	Desertification	Kilometer (km)	To evaluate the general effects of the climatic changes	
8	Capacity of the water courses	Meters cubes to the second (m^3/s)	To evaluate the phenomenon of the river functionality	
9	Forest surface	Number	To evaluate the management of the forest patrimony	
10	Agricultural firms that agree to eco-compatible measures	Number	To compare the adhesion of the agricultural firms to eco-compatible measures to regional level	

Excercise C

Gives the following cases to define which is the more appropriate method of standardisation

1) It wants to show the trend of an indicator related to a determined environmental phenomenology for which it is like that it assume inferior values than to those in a determined year.

2) You have an only value of the indicator.

3) You have 8 annual values of an indicator for a 10 year-old temporal arc (the data for two years are missed).

4) You have a historical series of 7 years of an indicator which has had a swinging trend in the period and based on existing environmental conditions, the necessity of an increase of such values is drawn.

5) You have the value of an indicator for a determined year and the expectation it is that such indicator assumes lower values.
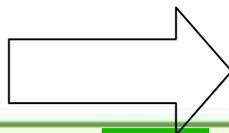
6) You have a historical series of 12 years of an indicator related to one determined phenomenology that has as goal the 30% reduction in comparison to the lowest value gotten during the last 10 years.

7) You have a historical series of 15 years of an indicator for which a 70% reduction is wished in comparison to the value assumed in the first year of the series.

8) You have a series of 5 years of an indicator that has had in the considered period a 30% increase in comparison to the initial year of the series.

9) You have the value of an indicator for the year x and of a normative that ask a 30% reduction in comparison to the year x-5.

Excercise D

On the basis of this fact–sheet indicator: to define the standardisation method more appropriate. _It's possible that indicator could ask for a normalisation before being standardizated._

Separately Collected Waste

DESCRIPTION: The indicator measure the quantity of municipal wastes collected in separately way in the year of reference.

UNITY OF MEASURE: Tons/year (t/y); percentage (%).

DATA SOURCE: APAT

PERIODICITY OF UPDATING : Annual

PURPOSE AND LIMITS: To verify the achievement of the target of separately collected waste fixed by the art. 24 of the D.Lgs. 22/97.

OBJECTIVES FIXED BY THE NORMATIVE ONE: For the separately collected waste of the municipal wastes the D.Lgs. 22/97, art. 24 paragraphs 1 fixes the followings objective: "In every optimal territorial area have to be guaranteed a separately collected municipal wastes equal to the following least percentages of wastes products: to) 35% within 2003."

STATE AND TREND: The separately collected wastes, also recording a discreet increase from the 19,2% of 2002 to the 21,5% of 2003, it doesn't achieve the objective fixed by the D.Lgs. 22/97 for 2001 (25%).

Excercise D

On the basis of this fact–sheet indicator: to define the standardisation method more appropriate. *It's possible that indicator could ask for a normalisation before being standardizated.*

Tab.1: Separately Collected Waste (1999-2003)

1999		2000		2001		2002		2003	
Quantity of MW generation	Quantity separately collected waste of MW	Quantity of MW generation	Quantity separately collected waste of MW	Quantity of MW generation	Quantity separately collected waste of MW	Quantity of MW generation	Quantity separately collected waste of MW	Quantity of MW generation	Quantity separately collected waste of MW
t*1000		t*1000		t*1000		t*1000		t*1000	
28.360	3.708	28.960	4.181	29.410	5.115	29.860	5.740	30.064	6.451

Excercise E

Following are brought the fact-sheet indicators "*Separately collected waste*" and "*Landfill disposal, in total and by type of waste*". Besides the principal information of the phenomenons are given inside the tables A and B. Verify the "sustainability" of the urban wastes management in the period 1999-2003 and under the hypothesis that the "separately collected waste", really, is started to recovery, and that the two indicators contribute in equal measure to monitoring the sustainability of the process of management, an integrated index useful to the purpose is built.
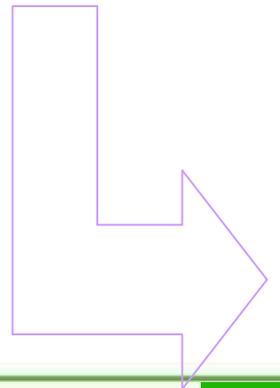
Separately Collected Waste

DESCRIPTION: The indicator measure the quantity of separately collected municipal wastes in the year of reference.

UNITY OF MEASURE: Tons/year (t/y); percentage (%).

DATA SOURCE: APAT

PERIODICITY OF UPDATING: Annual

PURPOSE AND LIMITS: To verify the achievement of the target of separately collected municipal wastes fixed by the art. 24 of the D.Lgs. 22/97.

OBJECTIVES FIXED BY THE NORMATIVE ONE: For the separately collected municipal wastes the D.Lgs. 22/97, art. 24 paragraphs 1 fixes the followings objective: "In every optimal territorial area have to be guaranteed a separately collected municipal wastes equal to the following least percentages of wastes products: to) 35% within 2003."

Year	Kind of data	t*1000
1999	Separately collected	3.708
	Production	28.364
2000	Separately collected	4.181
	Production	28.959
2001	Separately collected	5.115
	Production	29.409
2002	Separately collected	5.740
	Production	29.864
2003	Separately collected	6.340
	Production	30.034

Tab.A: Quantity of municipal wastes generated and separately collected waste (1999-2003)

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Landfill Disposal, In Total And By Type Of Waste

DESCRIPTION: It represents the quantity of wastes landfill disposal. It is given for typology of wastes.

UNITY OF MEASURE: Tons/year (t/y)

DATA SOURCE: APAT

PERIODICITY OF UPDATING: Annual

PURPOSE AND LIMITS: To verify the progress in the approach to the objective of reduction of the use of the landfill as method of disposal of the wastes, as foreseen by the D. Lgs 22/97, furnishing an indication about the effectiveness of the politics of wastes management.

OBJECTIVES FIXED BY THE NORMATIVE ONE: In Italy, the Directive 1999/31/CE have been taken in with the D. Lgs 13 January 2003 ns. 36 related to the dumps of wastes. The law establishes the operational and technical requisite for the landfill disposal, defining the procedures, the constructive criterions and the formalities of management of such fittings with the purpose to reduce the impact on the environment. With the purpose to reduce the use of the landfills it is required that the percentage of the municipal wastes landfill disposal in comparison to the produced quantity is not superior to 50%.

Year	Kind of data	t*1000
1999	MW landfill disposal	21.745
	Generation	28.364
2000	MW landfill disposal	21.917
	Generation	28.959
2001	MW landfill disposal	19.705
	Generation	29.409
2002	MW landfill disposal	18.848
	Generation	29.864
2003	MW landfill disposal	17.996
	Generation	30.034

Tab. B: Quantity of municipal wastes produced and quantity landfill disposal (1999-2003)