European Population Conference 2010
Vienna, Austria
1-4 September

Needs Assessment of Environmental Statistics in the Selected European and Central Asian Countries at the International Publications

Nader Motie Haghshenas [1]
Arezou Sayadi [2]

Abstract

Environmental indicators provide a measure of existing and expected pressure on the Environment. The main aim of this paper is to highlight and identify needs of environmental statistics, specifically data based on environmental indicators in the selected European countries comparing with Central Asian countries at the international publications. Data on environmental statistics are mainly taken from the *Statistical Yearbooks* for the selected European and central Asian countries, 1995-2007. In addition, we used the international organization databank (Such as UN, ESCAP, OECD and EUROSTAT) for definite time .The research is carried out on documentary method and is based on a comparative approach. The selected indicators based on sufficient time-series data are used to answer the question that do countries with different historical experiences and development levels manifest similar quality and condition environmental data producing at the international level? According to Kaufman theory on needs, needs assessment is a process for determining and addressing needs, or "gaps" between current conditions and desired conditions. All indicators are presented in an agreed format to support their practical application in the countries. It should be kept in mind that definitions and measurement methods vary among countries, and that inter-country comparisons require careful interpretation. But since indicators presented in this paper refer to both national and international level, we follow the needs for a vast comparison among environmental statistics of countries.

Key words: Data Needs, environmental statistics, European and Central Asian countries,

[1] Population Studies and Research Center in Asia & the Pacific (PSRC), Tehran, Iran. Corresponding Person: E-mail: haghshenas@psrc.ac.ir.
[2] Researcher,

Introduction

Environmental issues increasingly becoming the subject of policy makings. In sustainable development approach, environmental matters are jointed with socio-economic issues of development in national and international levels. Their resources are scatter among various institutes collecting information, and various methods used to collect them. The purpose of organizing environmental statistics is to overcome an ambivalence which is provided through a combination of data about different subject and different sources.

The interdisciplinary nature of environmental statistics as well as diversity of statistics producers and consumers of data, proposes necessity of a comparative analysis of data access and coordination in collecting, processing and publishing them. Many efforts have been made in the national and international levels to provide environmental statistics, frameworks for the design of a statistical project or to provide available data in a coherent statistical publication. These efforts were assessed by the Census Bureau, United Nations Secretariat a few years ago to determine the common characteristics that could be widely used in the international framework.

Relying on the results of this evaluation, clarifying aspects of environmental statistical variables to describe the possible quantity of environmental affairs appeared necessary.

Environmental indicators are a key tool for environment assessment in the countries based on sufficient time-series data to show key trends, help to describe causes and effects of environmental conditions and make it possible to track implementation of environmental policies.

Since a wide variety of environmental indicators presently in use reflect trends in the state of the environment and monitor the progress made in realizing environmental policy targets, environmental indicators have become indispensable to policy-makers. As such need assessment helps to show the shortage of environmental statistic producing or presenting, in the national and international publications.

There are different categories to show the environmental condition. Standardization and comparability of the environmental data among the different countries through out the world is extremely important to depict a universal picture of the environment condition. We are increasingly facing to environmental problems such as Acid rain, Air pollution, Global warming, Hazardous waste, Ozone depletion, Smog, Water pollution, Over population and Rain forest destruction. Therefore, the need for the source of the problems as well as recognizing the patterns of dealing with environmental issues turn out to be more and more brilliant. The statistics will be more complex if they can not be used clearly with capability of comparison. Thus clarifying and classifying environmental statistics needs to be done as soon as possible. In addition presenting a picture of different, between the national and international statistics of the countries relating to environment, leads to more efforts for removing statistical gaps. Accordingly the most important purposes of this study including:

1. How is the selected environmental indicator statistics condition, among the selected European countries?
2. How is the selected environmental indicator statistics condition, among the selected central Asian countries?
3. Do countries with different historical experiences and development levels manifest similar quality and condition environmental data presenting at the international level?
4. Where are the gaps between the produced and presented statistics of environment in the selected countries and how could be filled?

Data and Method

Data on environmental statistics are mainly taken from the *Statistical Yearbooks* for the selected European and central Asian countries, 1995-2007. In addition, we used the international organization databank (Such as UN, ESCAP, OECD and EUROSTAT) for definite time .The research is carried out on documentary method and is based on a comparative approach.

Theoretical Framework

Understanding the concept of need largely depends on one's perception and the society or the context which is studied. The concept of need is relative and it is influenced by values, attitudes and norms. Any need assessment technique is based on special definition of need and its domain and boundaries. Therefore, it is necessary that different opinions and beliefs in relation to the concept of need and consequently need assessment to be considered and diversity of perceptions of the concept to be clarified.
Psychologists divide "need" to two groups of primary and secondary needs. Physiologists pay attention to the biologic aspect of "need", for economists, needs relation to customers demand is important. Regardless of specialists, public have different understanding of need concept.
Generally from the social point of view definitions of need can be divided in four categories:

A: Need as a gap between current and desired conditions

One of the most common and accepted definitions of need is the definition proposed by Kaufman. He suggest that need is denoted on the situation in which current condition distant from desired condition and need assessment means fitting the distance between the current state and ideal condition and fitting the priorities for acting. Gilley and Eggland define need as a gap between a group of current condition and desired condition

and they suggest that the process of measuring and scientific evaluating of these gaps is need assessment.

Bradshaw boor, believe that definition of need assessment as a distance determination between the current and desired conditions is not a complete and comprehended definition. According to his view, when this definition is accepted, our actions in need assessment process will be limited to determine the desired condition (goals), current actions (current condition), and measuring the gap between these two. Then need assessment means process of goals determination, presenting the current condition, measuring needs and priorities for the action.

What distinguishes this description with others is the priorities of needs,and classification of needs according to their importance.

B: Need as a desire or preference

Need assessment, from this point of view, is the process of reviewing, and gathering opinions of individuals and groups about needs and to create consensus among the different views. What makes up the core of this theory is that views and ideas of individuals and groups in relation to needs, is the main focus of the need assessment, not the gap between the existing and preferred situation. If need be considered as an individual's desire, it is necessary that need assessment process, focus on determining the perceptions and the opinions of people. Many criticisms about this definition have been made such that the comments from people have not sufficient exactness and objectivity and perhaps also not based on fact, while the need is a concrete situation which is proposed about people. Furthermore, need can not always be the same as demand, because people may want of prefer some things but they are not needed. Meanwhile, when diseases, once may need to be injected because it is necessary for his health, but prefer not to be injected. Hence it can be resulted that individuals can not be always the best referee for their needs.

C: Need as a defect or shortcoming

This description of need assessment, despite the two pervious definitions has been less supported. From this view, need assessment is the process of identifying negative functions or the factors negatively influences on the functions. In other words according to Scriven's definition of need, need assessment is the method of recognizing the issues, difficulties and shortcoming in the once, individuals and organization's operation, which is containing recognition of ideal condition and diagnosis of problems and difficulties of the current situation.

D: Synthetic approach

Here all the mentioned descriptions are accepted. Need assessment as process of identifying the gap between the current and ideal situation, and weakness points as well as reviewing opinions and attitudes is considered.

Operational Definition of Concepts

According to Kaufman theory and social approach of needs assessment definition, environmental aspects are emphasized and its key conceptions have described as below:

Need assessment of environmental statistics: it is a process to achieve the optimal condition from current status of statistical items, based on programmed important needs in terms of priorities.

Produced environmental statistics: it is a situation of statistics production that items have been presented in the surveys and international publications.

Not produced environmental statistics: it is a situation of statistics production which items have not been presented in the surveys and international publications.

Data gap: it is a situation of statistics production which statistics and data related to data item are not available among international surveys and publications.

Reference time: the first time in which data is available.

Definition of environmental indices

Air pollution is the introduction of chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or damages the natural environment into the atmosphere.

An air pollutant is known as a substance in the air that can cause harm to humans and the environment. Pollutants can be in the form of solid particles, liquid droplets, or gases. In addition, they may be natural or man-made.

Pollutants can be classified as either primary or secondary. Usually, primary pollutants are substances directly emitted from a process, such as ash from a volcanic eruption, the carbon monoxide gas from a motor vehicle exhaust or sulfur dioxide released from factories.

Secondary pollutants are not emitted directly. Rather, they form in the air when primary pollutants react or interact. An important example of a secondary pollutant is ground level ozone — one of the many secondary pollutants that make up photochemical smog.

Note that some pollutants may be both primary and secondary: that is, they are both emitted directly and formed from other primary pollutants.

Major primary pollutants produced by human activity include:

- Sulfur oxides (SO_x) - especially sulfur dioxide, a chemical compound with the formula SO_2. SO_2 is produced by volcanoes and in various industrial processes. Since coal and petroleum often contain sulfur compounds, their combustion generates sulfur dioxide. Further oxidation of SO_2, usually in the presence of a catalyst such as NO_2, forms H_2SO_4, and thus acid rain. This is one of the causes for concern over the environmental impact of the use of these fuels as power sources.
- Nitrogen oxides (NO_x) - especially nitrogen dioxide are emitted from high temperature combustion. Can be seen as the brown haze dome above or plume downwind of cities. Nitrogen dioxide is the chemical compound with the formula NO_2. It is one of the several nitrogen oxides. This reddish-brown toxic gas has a characteristic sharp, biting odor. NO_2 is one of the most prominent air pollutants.
- Nitrous oxide (N2O) is produced by both natural and human-related sources. Primary human-related sources of N2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. Nitrous oxide is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests.
- Carbon monoxide (CO), also called carbonic oxide, is a colorless, odorless and tasteless gas which is lighter than air. It is highly toxic to humans and animals in higher quantities, although it is also produced in normal animal metabolism in low quantities, and is thought to have some normal biological functions.
- Carbon dioxide (CO2) is a colourless, odourless and non-poisonous gas formed by combustion of carbon and in the respiration of living organisms and is considered a greenhouse gas. Emissions mean the release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time.

- A chlorofluorocarbon (CFC) is an organic compound that contains carbon, chlorine, and fluorine, produced as a volatile derivative of methane and ethane. A common subclass is the hydro-chloro-fluoro-carbons (HCFCs), which contain hydrogen, as well.
- Methane is a chemical compound with the chemical formula CH4. It is the simplest alkane, and the principal component of natural gas. Methane's bond angles are 109.5 degrees. Burning methane in the presence of oxygen produces

carbon dioxide and water. The relative abundance of methane makes it an attractive fuel. However, because it is a gas at normal temperature and pressure, methane is difficult to transport from its source. In its natural gas form, it is generally transported in bulk by pipeline or LNG carriers; few countries transport it by truck.

- Greenhouse gases are gases in an atmosphere that absorb and emit radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect. The main greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone. In our solar system, the atmospheres of Venus, Mars and Titan also contain gases that cause greenhouse effects. Greenhouse gases greatly affect the temperature of the Earth; without them, Earth's surface would be on average about 33 °C (59 °F) colder than at present.
- The stratospheric ozone layer protects the planet from ultraviolet radiation. The release of certain manmade chemicals containing chlorine and bromine damages the ozone layer, resulting in harm to human health and the environment. The main ozone-depleting substances include chlorofluorocarbons (CFCs), halons, methyl chloroform, carbon tetrachloride, hydro-chloro-fluoro-carbons (HCFCs) and methyl bromide. These chemicals are used in refrigeration and air conditioning equipment, aerosol sprays, fire extinguishers, foamed plastics and pesticides Potential health impacts arising from damage to the ozone layer include sunburn, skin cancer, eye cataracts and reduced efficiency of the immune system. Environmental damage may be inflicted on crops, trees and animals, particularly phytoplankton and zooplankton, the tiny plants and animals living in the surface layers of lakes and oceans.
- Waste management is the collection, transport, processing, recycling or disposal, and monitoring of waste materials. The term usually relates to materials produced by human activity, and is generally undertaken to reduce their effect on health, the environment or aesthetics. Waste management is also carried out to recover resources from it. Waste management can involve solid, liquid, gaseous or radioactive substances, with different methods and fields of expertise for each. Waste management practices differ for developed and developing nations, for urban and rural areas, and for residential and industrial producers. Management for non-hazardous residential and institutional waste in metropolitan areas is usually the responsibility of local government authorities, while management for non-hazardous commercial and industrial waste is usually the responsibility of the generator.

- Waste collection is the component of waste management which results in the passage of a waste material from the source of production to either the point treatment or final disposal. Waste collection also includes the Kerbside collection of recyclable materials that technically are not waste, as part of a municipal landfill diversion program.
- Transport or transportation is the movement of people and goods from one location to another. Modes of transport include air, rail, road, water, cable, pipeline, and space. The field can be divided into infrastructure, vehicles, and operations.
- Waste treatment refers to the activities required to ensure that waste has the least practicable impact on the environment. In many countries various forms of waste treatment are required by law.
- Recycling involves processing used materials into new products to prevent waste of potentially useful materials, reduce the consumption of fresh raw materials, reduce energy usage, reduce air pollution (from incineration) and water pollution (from land filling) by reducing the need for "conventional" waste disposal, and lower greenhouse gas emissions as compared to virgin production. Recycling is a key component of modern waste reduction and is the third component of the "Reduce, Reuse, Recycle" waste hierarchy.
- Municipal waste contributes to several environmental problems including habitant destruction, surface and groundwater pollution and other forms of air, soil and water contamination. Depending on the disposal method, there may be other negative consequences, such as the creation of toxic substances through incineration. Landfills also emit methane (which contributes to global warming) and other gases.

Finding

Tables (1-6) show indicators of pollution issues[1] in terms of data production and presented at the national and international level for six selected countries .As indicated in table (1) for Iran 6 out of 10 selected environmental indicators have been produced, and 4 out of 6 produced data have been presented at the international level. Table 2 indicates that Iran in comparison to Pakistan has a better condition of environmental data production, but it is important that all data produced in Pakistan have been presented to the international organization of environmental statistics. Turkey as a member of ECO countries in comparison to two other member countries of ECO (Iran and Pakistan) is in the best situation so that all 10 indicators for this country have been produced which two indicators among them have not been presented in the International level. Since other 3 countries (Austria, Denmark, and Finland) are members of (OECD) they all have been situated in the parallel condition similar to turkey and all 10 indicators for them have been produced and just two indicators among them have not been presented in the International level.

Table 1- Environment Statistics of Iran at the National and International Level (2006-2007)

Indicators	National level		International level	
	Status of Statistics		Status of Statistics	
	Produced	Not produced	Presented	Not Presented
Total NOx Emissions		*		*
Total SO2 Emissions		*		*
Consumption of all ODS	*		*	
Consumption of CFCs	*		*	
CH4 Emissions	*			*
CO2 Emissions per capita	*		*	
CO2 Emissions	*		*	
GHG Emissions	*			*
N2O Emissions	*			*
Municipal waste collection		*		*

Source: (UNSD), United Nation Statistics and (ESCAP) Economic and Social Commission for Asia and the Pacific

Table 2- Environment Statistics of Turkey at the National and International Level (2006-2007)

[1] Pollution issues are one of OECD set of key environmental indicators. These key indicators have been selected from the core indicators included in the OECD core set of environmental indicators and are closely related to other environmental indicators sets developed and used by the OECD. Their selection took into account: their policy relevance with respect to major challenges for the first decade of the 21st century, including pollution issues and issues related to natural resources and assets. Pollution issues consist of Climate change, Ozone layer, Air quality, waste generation and freshwater quality. All indicators in this report are related to pollution issues as a key environmental indicator.

Indicators	National Level		International Level	
	Status of Statistics		Status of Statistics	
	Produced	Not Produced	Presented	Not presented
Total NOx Emissions	*		*	
Total SO2 Emissions	*		*	
Consumption of all ODS	*			*
Consumption of CFCs	*			*
CH4 Emissions	*		*	
CO2 Emissions per capita	*		*	
CO2 Emissions	*		*	
GHG Emissions	*		*	
N2O Emissions	*		*	
Municipal waste collection	*		*	

Source: (UNSD), United Nation Statistics, (OECD) Organization for Economic Cooperation and Development, and European Commission (eurostat)

Table 3- Environment Statistics of Pakistan at the National and International Level (2006-2007)

Indicators	National Level		International Level	
	Status of Statistics		Status of Statistics	
	Produced	Not Produced	Presented	Not Presented
Total NOx Emissions		*		*
Total SO2 Emissions		*		*
Consumption of all ODS	*		*	
Consumption of CFCs	*		*	
CH4 Emissions		*		*
CO2 Emissions per capita	*		*	
CO2 Emissions	*		*	
GHG Emissions		*		*
N2O Emissions		*		*
Municipal waste collection		*		*

Source: (UNSD), United Nation Statistics and (ESCAP) Economic and Social Commission for Asia and the Pacific

Table 4- Environment Statistics of Austria at the National and International Level (2006-2007)

	National Level	International Level

Indicators	Status Of Statistics		Status Of Statistics	
	Produced	Not Produced	Presented	Not Presented
Total NOx Emissions	*		*	
Total SO2 Emissions	*		*	
Consumption of all ODS	*			*
Consumption of CFCs	*			*
CH4 Emissions	*		*	
CO2 Emissions per capita	*		*	
CO2 Emissions	*		*	
GHG Emissions	*		*	
N2O Emissions	*		*	
Municipal waste collection	*		*	

Source: (UNSD), United Nation Statistics, (OECD) Organization for Economic Cooperation and Development, and European Commission (eurostat)

Table 5- Environment Statistics of Denmark at the National and International Level (2006-2007)

Indicators	National Level		International Level	
	Status of Statistics		Status of Statistics	
	Produced	Not Produced	Presented	Not Presented
Total NOx Emissions	*		*	
Total SO2 Emissions	*		*	
consumption of all ODS	*			*
Consumption of CFCs	*			*
CH4 Emissions	*		*	
CO2 Emissions per capita	*		*	
CO2 Emissions	*		*	
GHG Emissions	*		*	
N2O Emissions	*		*	
Municipal waste collection	*		*	

Source: Ibid.

Table 6- Environment Statistics of Finland at the National and International Level (2006-2007)

Indicators	National level		International level	
	status of statistics		status of statistics	
	Produced	Not produced	Presented	Not Presented
Total NOx Emissions	*		*	
Total SO2 Emissions	*		*	
consumption of all ODS	*			*
Consumption of CFCs	*			*
CH4 Emissions	*		*	
CO2 Emissions per capita	*		*	
CO2 Emissions	*		*	
GHG Emissions	*		*	
N2O Emissions	*		*	
Municipal waste collection	*		*	

Source: Ibid.

In the next 6 tables, some of the environmental data gaps in different years for selected countries are shown. According to table 7, data gaps for Austria are mostly related to

waste statistics. Since this country has reasonably good quality in producing and presenting environmental statistics, we have entered to details for waste statistics and shown the data gaps for its subdivisions. It should be noted that due to some restrictions for access to national data, data gaps obtained, refer to international statistics, and we definitely emphasize on data presented at the international organizations such as what have been sited as source. The state of environmental items for Austria indicates that there are 8 data gaps during the 1995-2003 which as mentioned before are sub items of waste generation.

Table 8 shows that Denmark is in a better situation of environmental statistics, so that only 3 items relating to waste generation have data gap which all relate to years 1995-2003.

The state for Finland as table 9 shows is similar to Austria and there are 8 data gaps for years 1995-2003. But when we turn to the countries of Asia as ECO members, the condition is completely different especially for Iran and Pakistan. But turkey is totally apart from two other ECO countries.

Tables 10 and 11 illustrate that Iran and Pakistan not only have data gaps in emissions statistics for 1955-2003 but also they are not among the list for some items, it means that they have entirely not reported some items to references that we have referred to. Turkey is a country with a good quality in producing and reporting statistics to international organization. It shows 2 items that have data gap (Table 12).

Table 7- Situation of Environmental Statistics for Austria

Number	Items	Year	Data Gap	Reference year	Latest year

1	Generation Of Municipal Waste Commerce And Trade, Small Businesses, Office Buildings, Institutions	1995-2003	…	1995	2003
2	Generation Of Municipal Waste Street And Market Cleaning, Yards, Litter Containers, Etc	2001-2003	…	1995	2003
3	Generation Of Municipal Waste Household	2001-2003	…	1995	2003
4	Municipal Waste By Composition	1995,97,98 2000-2003	…	1995	2003
5	Waste Generated In Manufacturing Industry	1997-2003	…	1995	2003
6	Hazardous Waste Disposal (Total Amount)	1995-2003	…	1995	2003
7	Hazardous Waste Generated Treatment (Total Amount)	2000-2003	…	1995	2003

Source :(INE) Instituto Nacional de Estadistica and (eurostat) europian comission,
Footnote: the sign (-) between the tow mentioned years in the column of Year indicates that all the years not sited during them are considered and they have not been shown due to not enough space in the table.
… : Data is not available

Table 8- Situation of Environmental Statistics for Denmark

Number	Items	Year	Data Gap	Reference year	Latest year
1	Generation of municipal waste Street and market cleaning, yards, Litter containers, etc	1995-2003	…	1995	2003
2	Municipal waste by composition	1995-2003	…	1995	2003
3	Waste generated in manufacturing industry	1995-2003	…	1995	2003

Source: Ibid,
… : Data not available

Table 9- Situation of Environmental Statistics for Finland

Number	Items	Year	Data Gap	Reference year	Latest year
1	Municipal waste incinerated	1995-96	…	1995	2003
2	Generation of municipal waste Commerce and trade, small businesses, office buildings, institutions	1995,96,98	…	1995	2003
3	Generation of municipal waste Street and market cleaning, yards, Litter containers, etc	1995-2003	…	1995	2003
4	Generation of municipal waste Household	1995,96,98	…	1995	2003
5	Municipal waste by composition	1995,96,98,99 2001-2003	…	1995	2003
6	Waste generated in manufacturing industry	1995,96,98,99 2001-2003	…	1995	2003
7	Hazardous waste disposal (total amount)	1995,96,98,99 2003	…	1995	2003
8	Hazardous waste generated treatment (total amount)	95,96,98,99 ,2003	…	1995	2003

Source :Ibid,
… : Data not available

Table 10- Situation of Environmental Statistics for Iran

Number	Items	Year	Data Gap	Reference year	Latest year
1	Total NOx emissions	1990-1993 1995-2006	…	1990	2006
2	Total SO2 emissions	1990-1993 1995-2006	…	1990	2006
3	CH4 emissions	1990-1993 1995-2006	…	1990	2006
4	Greenhouse gas emissions	The country is not among the list			
5	N2O emissions	The country is not among the list			
6	Municipal Waste Collection	The country is not among the list			
7	Percentage of Total Population served by Municipal Waste Collection	The country is not among the list			

Source: UNSD/UNEP Questionnaires on Environment Statistics, Waste section,
Footnote: the sign (-) between the tow mentioned years in the column of Year indicates that all the years not sited during them are considered and they have not been shown due to not enough space in the table.
… : Data not available.

Table 11- Situation of Environmental Statistics for Pakistan

Number	Items	Year	Data Gap	Reference year	latest year
1	Air pollution: Total NO_x emissions	1990-1993 1995-2006	…	1990	2006
2	Air pollution: Total SO_2 emissions	1990-1993 1995-2006	…	1990	2006
3	CH_4 emissions	1990-1993 1995-2006	…	1990	2006
4	Greenhouse gas emissions	1990-1993 1995-2006	…	1990	2006
5	N_2O emissions	1990-1993 1995-2006	…	1991	2007
6	Municipal Waste Collection	The country is not among the list			
7	Percentage of Total Population served by Municipal Waste Collection	The country is not among the list			

Source: Ibid,
… : Data not available

Table 12- Situation of Environmental Statistics for Turkey

Number	Items	Year	Data Gap	Reference year	latest year
1	Municipal Waste Collection	1990	…	1990	2006
2	Percentage of Total Population served by Municipal Waste Collection	1990, 1999, 2000, 2002-2007	…	1990	2007

Source: Ibid,
… : Data not available.

Tables (13 –18) describe a snapshot of selected environmental statistics for chosen countries. Data were updated according to latest statistics available in (UNSD) United Nation Statistics Division. These tables have been provided for comparison between the selected countries from the environmental statistics point of view.

The lowest amount of SO2 emissions per capita which is (3.0 kg) is related to Austria and the highest one is (16.0 kg) for Finland. Denmark with (3.0 kg) emissions per capita shows the less amount of SO2 emission between the selected countries after Austria. Nevertheless table 17 shows a relatively low number of SO2 emissions for Pakistan but it is not a comparable data because referrers to 1994 whereas data for other countries except Iran are mostly related to 2006.Turkey is the next ranked of SO2 emission behind Finland among these countries and while it seems that the number of this index for Iran has been recorded zero for 1994 in the UN statistics, National statistics of Iran show that the number of index in terms of per capita for 1991 and 1996 were (15.2 and 19 kg) respectively.

It seems that Turkey has the lowest amount of NOx emissions per capita among the countries in 2006. Finland, Denmark, Austria and Turkey with (37.0, 35.0, 27.0 and 16.0kg) NOx emissions per capita respectively, are ranked from high to low. Since data for Iran and Pakistan refer to 1994 they can not be compared with other countries but these two countries are brilliantly different in the amount of NOx emissions per capita and whereas this data for Pakistan in 1994 is 3.0 kg per capita for Iran is about 7 times as many as Pakistan. But according to the national statistics for Iran in 2005 this index has been down to 18.2 kg per capita.

Statistics of CO2 emissions per capita in 2006 enlighten that Pakistan and Finland have the lowest and the highest amount of the index respectively and other countries from low to high are correspondingly Turkey, Iran, Austria and Denmark.

The most amounts of GHG emissions per capita in terms of tones CO2 equivalent has been recorded for Finland (15.0) and the least amount (5.0) refers to Turkey in 2006. The index number for Austria and Denmark are respectively (11.0 and 13.0). Data for Iran and Pakistan are for 1994 and they can not be compared with pervious countries. Since Austria, Denmark and Finland are among the EU countries and they report the state of ozone depleting to Ozone Secretariat the data of this index for these countries is not available here. Statistics of ozone depleting for Iran is 550.0 tones, for Pakistan 170.0 tones but for Turkey has been recorded zero.

Statistics of GHG emissions from energy shows that selected countries except Pakistan are in the similar state.

In the next part of these tables, waste data status is shown, but there is not data for Iran and Pakistan in the case of waste. In Austria, Denmark and Finland 100% of population are served by municipal waste collection while the percentage of this index for Turkey is 73%. The most and the least amount of Municipal waste collected between these four countries is observed in Turkey and Finland respectively. Estimated data for Hazardous waste generated explains that highest and lowest amounts refer to Finland and Turkey respectively.

Table 13-Environment Statistics Snapshot: Austria

Air and climate Emissions of :	Statistics	Year
SO2 per capita (kg)	3.0	2006
NOx per capita (kg)	27.0	2006
CO2 per capita (tones)	9.0	2006
GHG per capita (tones CO2 eq.)	11.0	2006
Ozone depleting CFCs (ODP tones)	…	
GHG from energy (%)	77.0	2006
Waste		
Population served by municipal waste collection (%)	100	2007
Municipal waste collected(1000t)	4950	2007
Hazardous waste generated (tones)	961896*	2007

Source: United Nations Statistics Division,
* The figure corresponds to the latest year available, which may not necessarily be 2007.
… : Data not available.

Table 14- Environment Statistics Snapshot: Denmark

Air and climate Emissions of:	Statistics	Year
SO2 per capita (kg)	5.0	2006
NOx per capita (kg)	35.0	2006
CO2 per capita (tones)	11.0	2006
GHG per capita (tones CO2 eq.)	13.0	2006
Ozone depleting CFCs (ODP tones)	…	
GHG from energy (%)	79.0	2006
Waste		
Population served by municipal waste collection (%)	100	2007
Municipal waste collected(1000t)	4364*	2007
Hazardous waste generated (tones)	493111**	2007

Source: United Nations Statistics Division,
* Country estimate.
** The figure corresponds to the latest year available, which may not necessarily be 2007.
… : Data not available.

Table 15- Environment Statistics Snapshot: Finland

Air and climate Emissions of:	Statistics	Year
SO2 per capita (kg)	16.0	2006
NOx per capita (kg)	37.0	2006
CO2 per capita (tones)	13.0	2006
GHG per capita (tones CO2 eq.)	15.0	2006
Ozone depleting CFCs (ODP tones)	…	
GHG from energy (%)	82.0	2006
Waste		
Population served by municipal waste collection (%)	100	2007
Municipal waste collected(1000t)	2675	2007
Hazardous waste generated (tones)	2710496*	2007

Source: United Nations Statistics Division,
* The figure corresponds to the latest year available, which may not necessarily be 2007.
… : Data not available.

Table 16-Environment Statistics Snapshot: Iran

Air and climate Emissions of:	Statistics	Year
SO2 per capita (kg)	0.0 *	1994
NOx per capita (kg)	20.0	1994
CO2 per capita (tones)	7.0	2006
GHG per capita (tones CO2 eq.)	6.0	1994
Ozone depleting CFCs (ODP tones)	550.0	2007
GHG from energy (%)	83.0	1994
Waste		
Population served by municipal waste collection (%)	…	
Municipal waste collected(1000t)	…	
Hazardous waste generated (tones)	…	

Source: United Nations Statistics Division,
… : Data not available.
* National data for Iran (show that the number of index in terms of per capita for 1991 and 1996 were (15.2) and (19) respectively. In addition according to the same recourse data is available for 2005 as well which is (11.2 kg per capita)

Table 17- Environment Statistics Snapshot: Pakistan

Air and climate Emissions of:	Statistics	Year
SO2 per capita (kg)	6.0	1994
NOx per capita (kg)	3.0	1994
CO2 per capita (tones)	1.0	2006
GHG per capita (tones CO2 eq.)	1.0	1994
Ozone depleting CFCs (ODP tones)	170.0	2007
GHG from energy (%)	52.0	1994
Waste		
Population served by municipal waste collection (%)	…	
Municipal waste collected(1000t)	…	
Hazardous waste generated (tones)	…	

Source: United Nations Statistics Division,
… : Data not available.

Table 18- Environment Statistics Snapshot: Turkey

Air and climate Emissions of:	Statistics	Year
SO2 per capita (kg)	14.0	2006
NOx per capita (kg)	16.0	2006
CO2 per capita (tones)	4.0	2006
GHG per capita (tones CO2 eq.)	5.0	2006
Ozone depleting CFCs (ODP tones)	0.0	2007
GHG from energy (%)	78.0	2006
Waste		
Population served by municipal waste collection (%)	73	2007
Municipal waste collected(1000t)	30000	2007
Hazardous waste generated (tones)	10796	2007

Source: United Nations Statistics Division.

Discussion and Strategic Implications

This study aimed to identify statistical needs related to the environment specially pollutants and waste in national and international environmental statistics resources from 1990 to latest years which are mostly 2006 and 2007. Findings show that condition of producing (at the national level) and presenting (at the international level) environmental data is brilliantly different between the selected European countries as developed and selected central Asian countries as developing but Turkey is in the superior condition among selected developing central Asian countries. All 10 items took into consideration in Austria, Denmark, Finland and Turkey have been produced and presented expect two of them which are consumption of ODS and CFCs. Countries, Iran and Pakistan have more gap in producing data and presenting them as well.

Trend of data gap during 1990 -2007 for these countries explains that data gaps for countries, Austria, Denmark, Finland and Turkey are mostly related to details statistics of waste while Iran and Pakistan in addition to lack of data connected with waste statistics, have data gap in air pollution statistics.

Data presented in this report according to country snapshots of environmental statistics available in (UNSD) are also another depiction of statistics which show the gaps, and moreover provide comparability between the statistics for indices among the countries and confirm pervious results. Nevertheless these snapshots show a similar layout for statistical result of environment but it is not comprehensive enough and it needs to be improved according to all details and subdivisions of environmental indices.

As stated by the report selected European countries are generally benefit from better statistical condition than Eco countries expect Turkey, though Austria, Denmark and Finland have data gap in some items as well. In spite of all efforts done to depict an inclusive, clear and comparable picture of environment condition by national and international community, it seems that we are still far from that portrayal and experts involved with environmental issues are expected to improve an agreed format for statistics and for achieving Millennium Development Goals strengthening national statistical systems is a key factor to monitor environment statistics. Data collection is not sufficient for sustainable statistical programs and national producers involvements are needed to avoid duplication and waste of resources.

Consequently, countries should create firms national strategies based on the countries' environmental requirements of international commitments for their data needs on environment statistics. It involves identifying material weaknesses and strengths, and evaluating possible solutions that take those qualities into consideration.

Bibliography/References

1. United Nation Statistics Division (UNSD) 2006-2007, New York,

2. Economic and Social Commission for Asia and the Pacific, (ESCAP) 2006-2007,

3. United Nation Environment Program (UNEP) 1990-2007,

4. European commission (EUROSTAT) 1995-2003,

5. Instituto Nacional de Estadistica (INE) 1995-2003,

6. Organization for Economic Cooperation and Development (OECD),

7. United Nations, 2001, World Population Monitoring: Population, Environment and Development, New York.

***