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The Role Of Documentation And Measurement Tools In
Governing Urban Impact On Environment
(A Study on Erbil City Rapid Development)



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Central
square
in Erbil
City

ABSTRACT

Development

Impact On Environment

Assessment of performance

Measurement Tools

Documentation

Indicators

Indexing systems

Recommendations

Planning

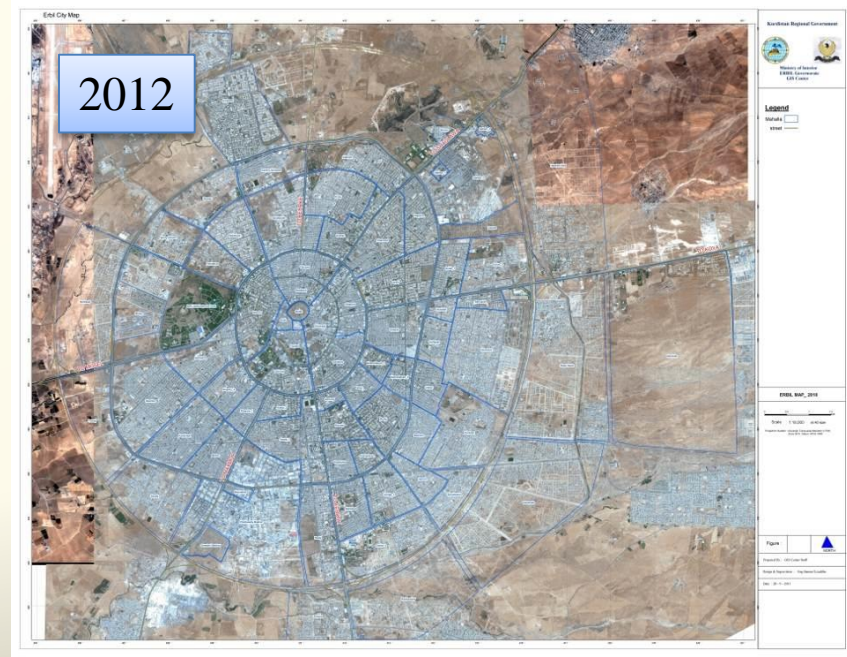
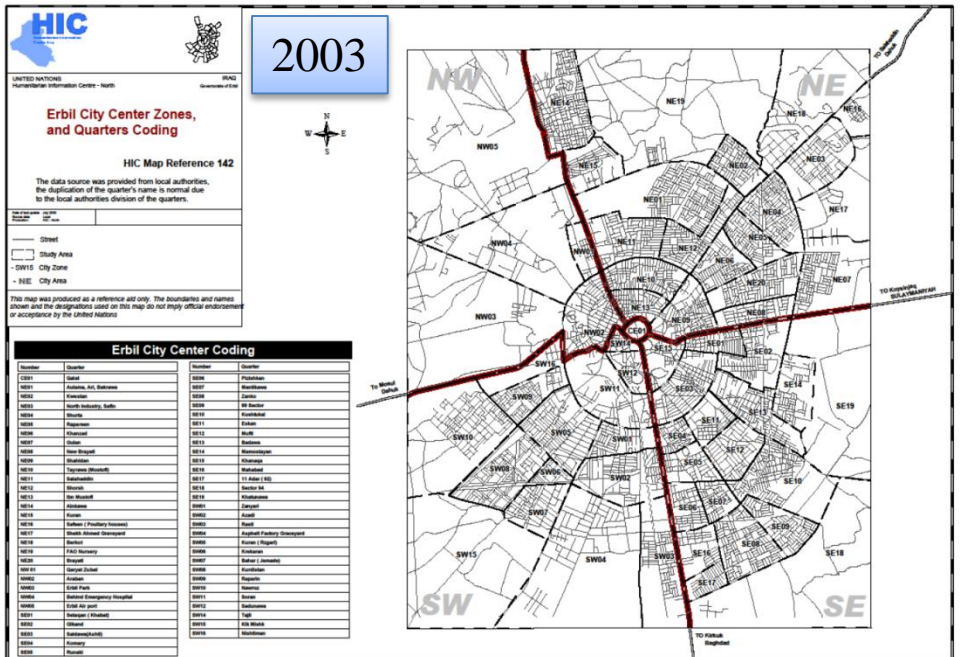
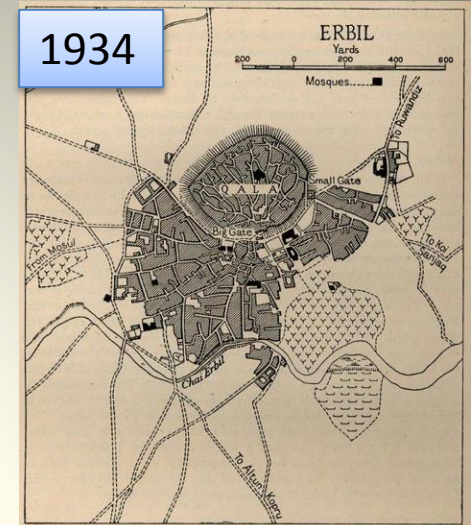
The research ends with a major Conclusion:

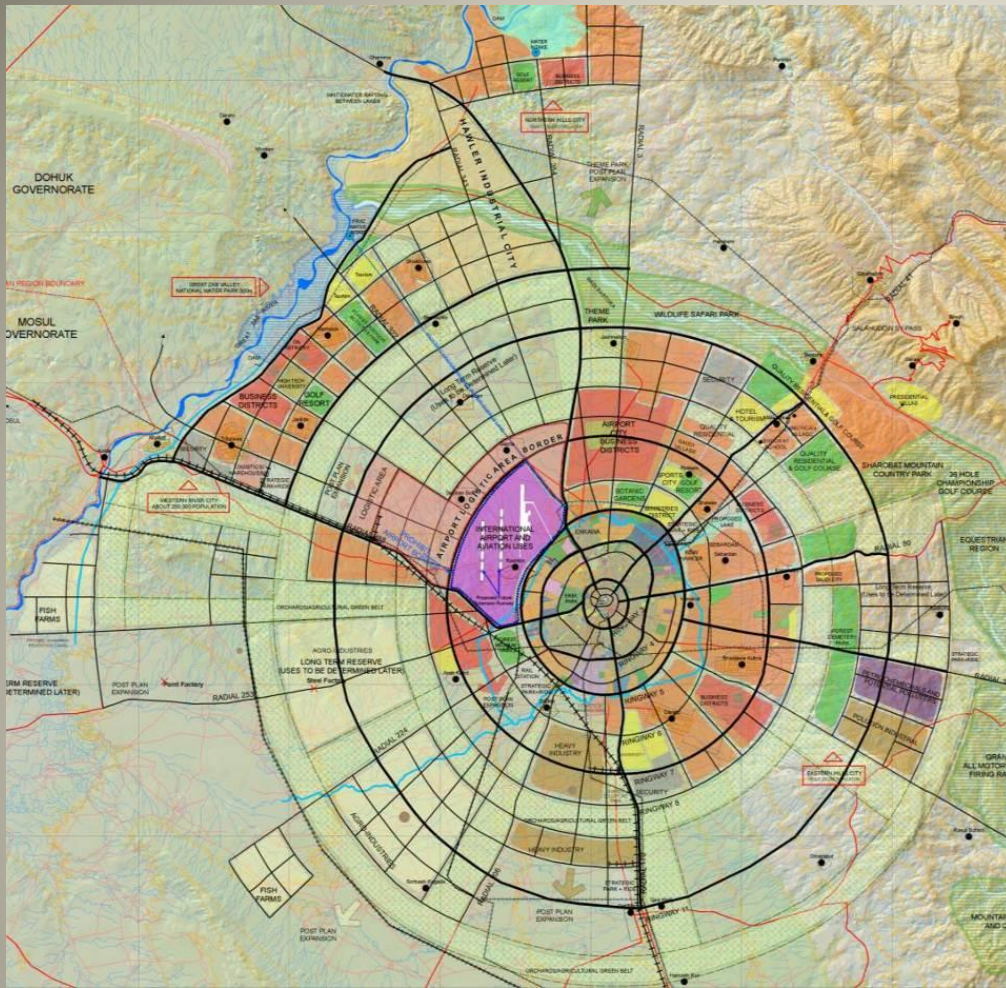
Indicators derived from documented data and measurement tools are the second major governing factors of assessment of performance after the performance itself,

And they are the major governing factor in directing the future performance and impact on environment if the assessments and indexing systems results were used as input for planning.

ERBIL CITY

Erbil Citadel one of the oldest continuously inhabited civilized settlement with a history goes back at least 5000 years





In 2030 as per the city comprehensive development plan (Master plan) is to be of 50 kilometre what means duplicating the size about 2000 times in 84 years

This development had a lot of positive aspect like

- 1-Solveing a sever housing problem in the region by having over capacity in housing now ,
- 2- Creating new jobs and opening markets for local and foreign labor,
- 3- Attracting Local and International Investors,
- 4- Highlighting the City and the region Internationally,
- 5- Raising the living standards in the Region and many other positive points.

But this non-properly controlled Rapid Urban Growth has impacts on Built and non-Built Environments. Such impacts can be detected by indexes on local and international levels

Architects responsibility and commitment

1-1-UNESCO/UIA CHARTER FOR ARCHITECTURAL EDUCATION

Revised Version 2005

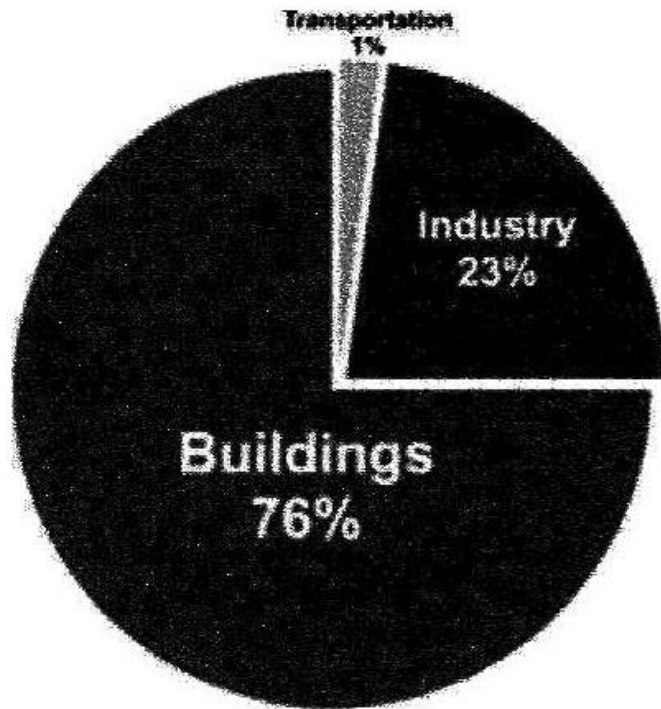
Preamble

“We, the **architects**, concerned for the future qualitative development of the built environment in a fast changing world, believe that architecture involves everything that influences the way in which the built environment is planned, designed, made, used, furnished, landscaped and maintained. We feel responsible for the improvement of the education and training of future architects to enable them to meet the expectations of XXIst Century societies worldwide for sustainable human settlements in every cultural heritage”.



AIA

Architects and Climate Change



GRAPHIC 4: 76% of all power plant generated electricity is used just to operate buildings.

76% of all power plant Generated electricity is used to operate buildings in USA.

It is assumed that these figures are highly reliable since they are derived from a high reputation institution report (AIA), the research **did not manage to get such figures locally from such professional institution.**

So it is assumed that such data are needed as a start in the matter of dealing with impact on Environment and where to direct efforts of Sustainability.

The above UIA and UNESCO declaration and AIA Environment Committee report show a commitment for architects all over the world to work towards sustainable development,

So the question is whether we in the middle east in general and in Kurdistan Region\Iraq in specific need to go through this procedure, of course it is a decision makers and governments responsibilities

As an observers passing through the publications of the Ministries of Environment in the region and Central Government, a rising awareness in this direction can be noticed

Conclusion:

While in USA the matter of dealing with Environment is a matter of detailed plans by reliable institutions, based on precise data measured by specific measuring tools, it is locally just an awareness that has been just rising.

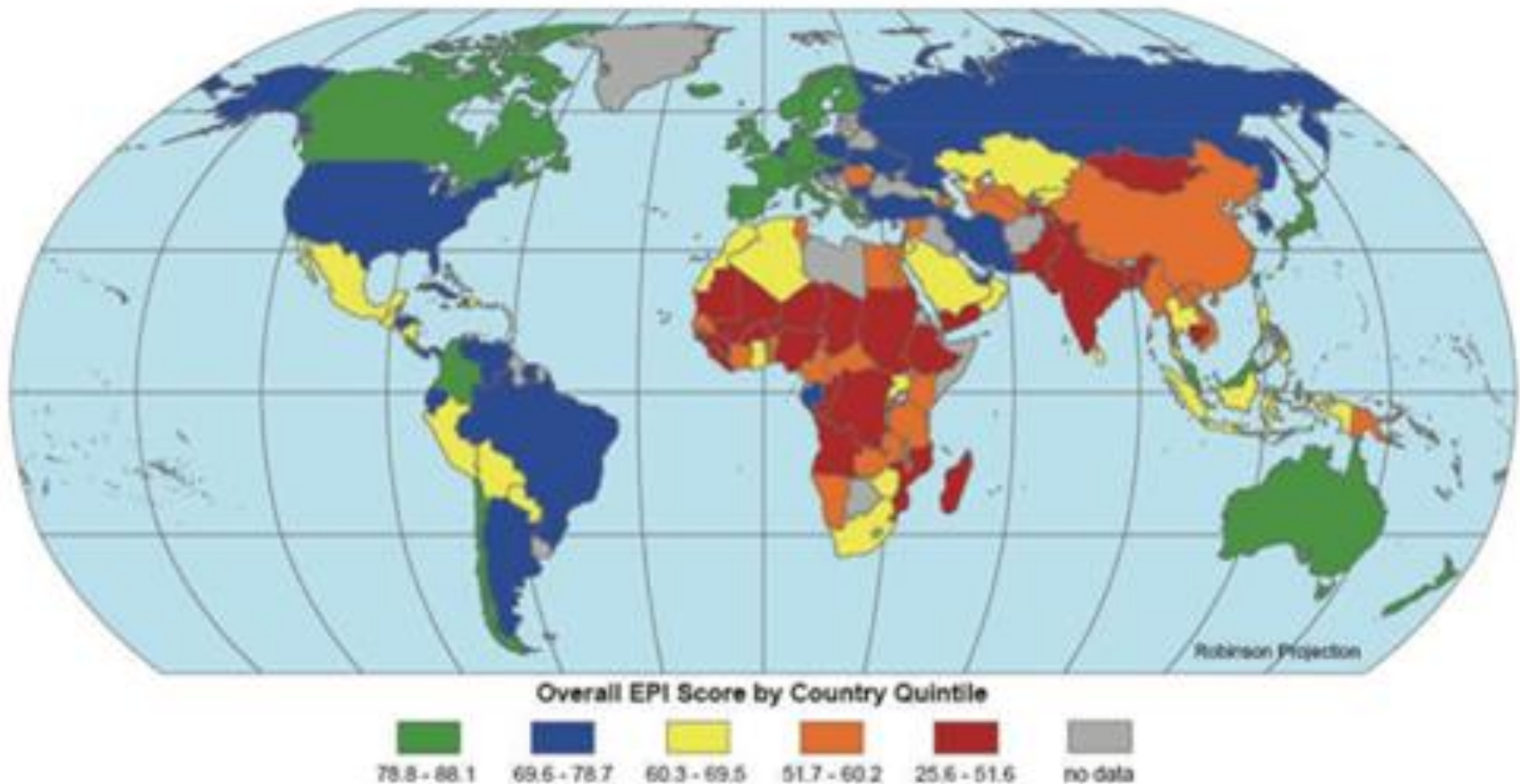
So **how can we tell** if what we are doing is in the direction of sustainability and whether the rapid development in Kurdistan Region in General and Erbil city in specific is compiling with the international Environmental recommendations and what are the means of measuring the impact of such a development on Environment

- Ecological footprint
- Environmental Performance Index
- Environmental Sustainability Index
- Environmental Vulnerability Index

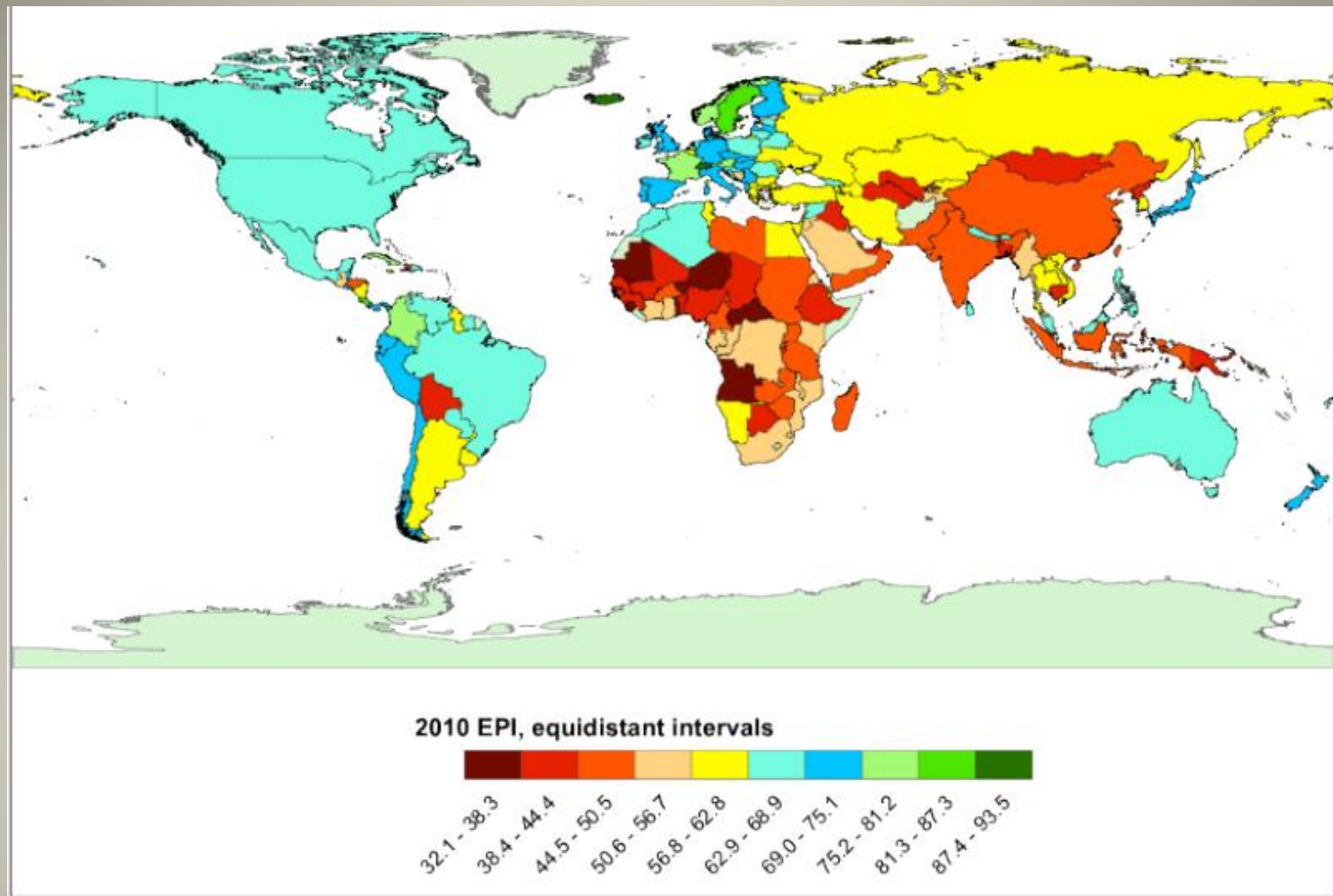
Environmental Performance Index (EPI)

For example “Yale-Columbia research team shifted in 2006 to an Environmental Performance Index (EPI) that focuses on a narrower set of environmental issues for which **governments can be held accountable**

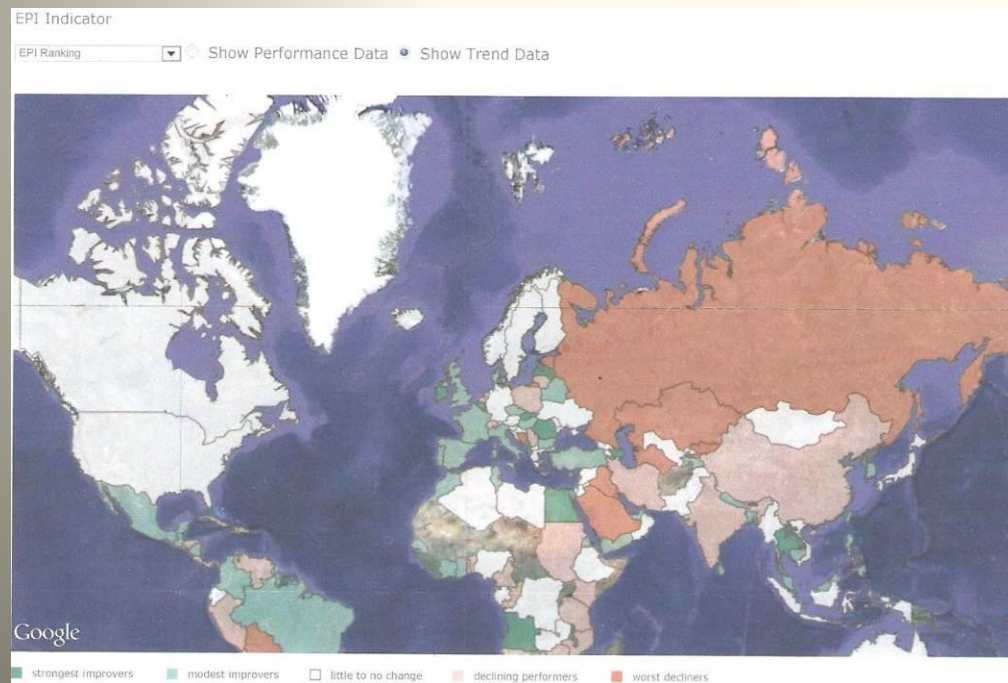
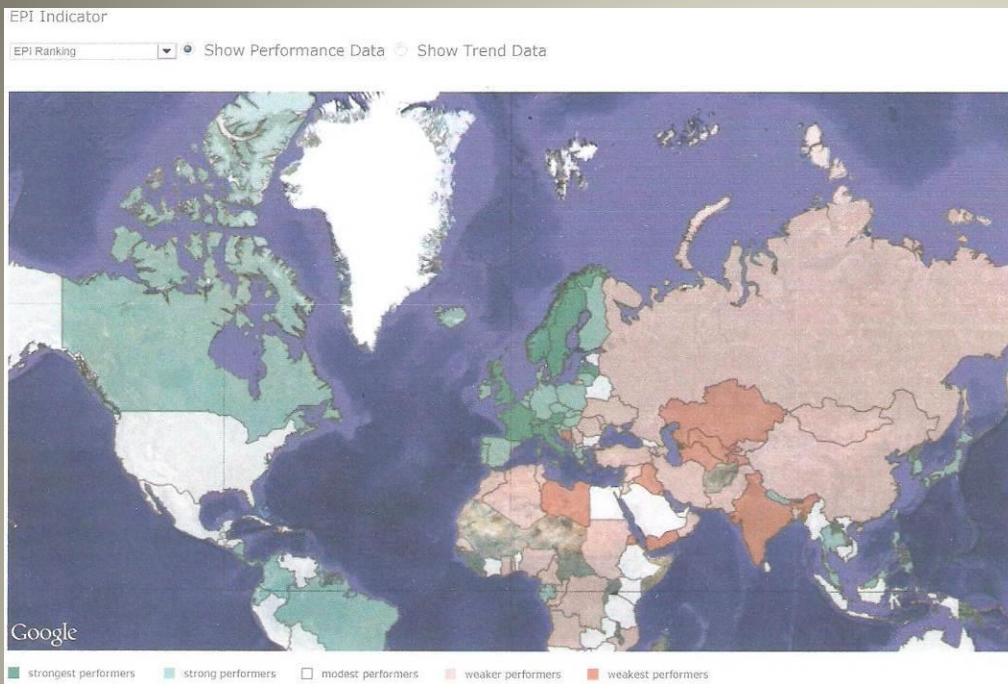
Pilot 2006 Environmental Performance Index



Iraq in 2006 was indicated as no data which represent the problem Number 1-



In 2010 Iraq is highlighted as one of the worst performance, what means that in 4 years the sufficient highly sophisticated data that needs professional people and measurement instruments and methods was available to put the country on the index



The 2012 Environmental Performance Index (EPI) and Pilot Trend EPI (Trend EPI) rank **132** countries on **122 performance indicators** in ten policy categories and two overarching objectives that reflect facets of Environmental Health and Ecosystem Vitality. These indicators provide a gauge of how close countries are to environmental policy goals.

<u>YEAR</u>	<u>COUNTRY</u>			<u>SCALE</u>
	<u>IRAQ</u>	<u>JORDAN</u>	<u>UAE</u>	
<u>EPI 2006</u>	No Data	50-60	70-78	25-88
<u>EPI 2010</u>	38-44	50-56	44-50	32-93
<u>EPI 2012</u> PERFORMAN CE	Weakest Performers	Weaker Performer	Modest Performer	Weakest to Strongest Performers (5) ranks
<u>EPI 2012</u> IMPROVME NTS	Worst Decline	Little to no Change	Modest Improver	Rate of Improvement from strongest to worst decline in(5) Ranks

Case 1(Iraq):

It can be noticed that the change from no data to worst impact with having indications about the fields of decline and direction of reforms in the detail reports it can clearly be noticed that these data are not available locally and it is based on assumptions or external observers' inspections and calculations and some of them may be misleading. So the documentation systems and calculation tools highly govern the Impact on Environment as a rank on the index or as direction towards future reforms.

Case 2 (Jordan):

The first general look at the results shows uniform results but also can be checked if all the indexes are locally driven by external inspectors in order to prevent misleading instructions

Case 3 (UAE):

It clearly show a contradiction between results for the 3 years results, a simple cross check and comparison between results of Jordan and UAE in 2006 UAE was so belter performer than Jordan but in 2010 there is a dramatic decline in UAE performance and it is less than Jordan ranks, then in 2012 UAE is shown as modest performer and modest improver while Jordan is shown as weaker performer and little to no change this comparison indicates illogical ups and dawn in UAE performance in intervals of 2-4 years, this may cause conflict in direction of reforms if these results were adopted as strategy for reforms

2- The Research problem:

The available local literature miss-regards proper documentation systems of data and proper measurement and investigation tools needed for the assessment of Environmental performance

3-Research objectives:

To shed light on how international indexes work in order to develop local data collection and documentation approach that may serve feeding proper data and developing Environmentally mal functioning local systems.

4-Research Methodology:

To review available literature regarding indexing systems and the adopted environmentally oriented legislations, in order to highlight the required indicators for Measuring Environmental Performance.

legislations:

LEED USA



LEED® standards, in full Leadership in Energy and Environmental Design standards, a certification program devised in 1994 by the U.S. Green Building Council (USGBC; founded 1993) to encourage sustainable practices design and development by means of **tools and criteria for performance measurement**

The Code measures the sustainability of a home against design categories, rating the ‘whole home’ as a complete package. The design categories included within the Code are:

- **energy/CO2**
- **water**
- **materials**
- **surface water run-off**
- **waste**
- **pollution**
- **health and well-being**
- **management**
- **ecology**



LEED Dubai:

Department of Planning & Development
Ports, Customs & Free Zone Corporation
Government of Dubai



دائرة التخطيط والتطوير
مؤسسة الموانئ والجمارك والمنطقة الحرة
حكومة دبي

Green Building Regulations for Dubai World Developments

(For projects Registered with USGBC under LEED Version 2.2)

REGULATION NO.GB-001

1st EDITION January 2008

This represent the available most developed building regulations in middle east it do represent a greater awareness regarding environmental performance of urban development and expansion but compared with the original LEED and the European Environment Agency (EEA), it looks limited in terms of indicators but for Kurdistan Region it can be recommended as model to be studied and by analogy to be adopted for the local requirements,

Indicators:

The here under quotation from the World Resources Institute report of 1996 gives a simplified definition of what Indicators mean and that they have three levels of conveying meaning

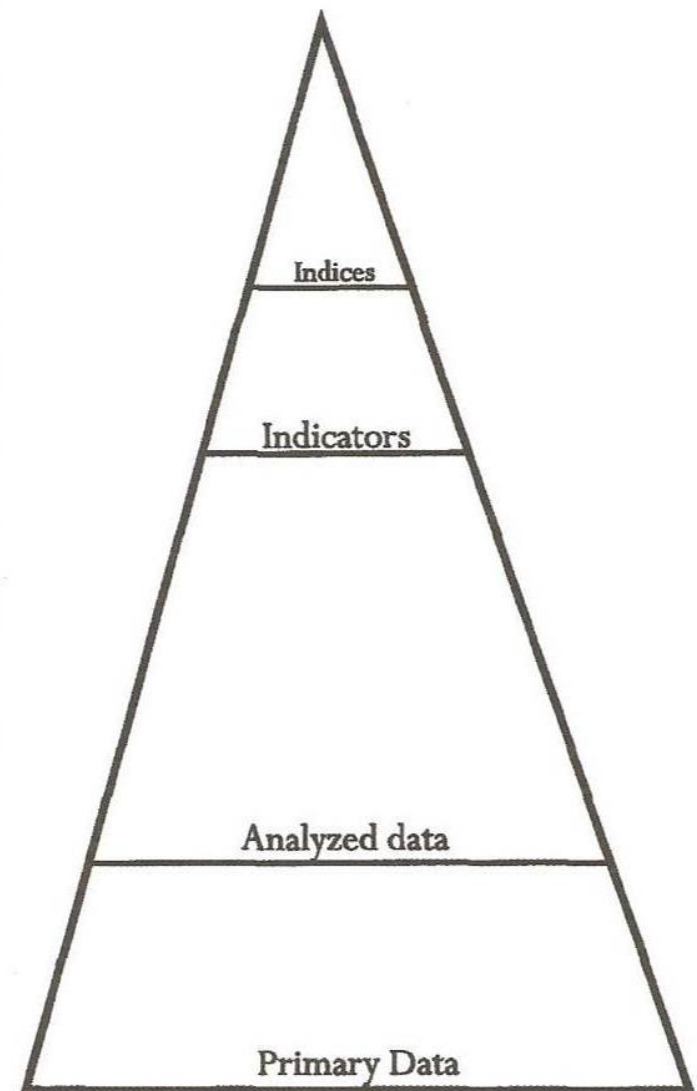
2-1-local level

2-2-national level

2-3-international level

The major role of an indicator is to be useful to their intended audience, meaningful to decision makers and understandable by the public, they have to be easily interpreted in terms of environmental trends or progress towards national policy goals, so indicators specifications and design depend on who is to use it and for what

Figure 1. The Information Pyramid



One of the most sophisticated indicator systems is the one developed and adopted by the European Environment Agency (EEA) that have over all 230 indicators divided into 23 category as follows

No.	Field	Number indicators	of Notes
1	Chemicals	(4)	Each of these indicators has a specific assessment procedure and measurement tools and all the related data are properly documented and saved in a data bank so it is there when it is needed.
2	Climate change	(46)	
3	Coasts and seas	(9)	
4	Energy	(41)	
5	Environment and health	(6)	
6	Environmental scenarios	(44)	
7	Fisheries	(4)	
8	Green economy	(2)	
9	Household consumption	(2)	
10	Industry	(8)	
11	Land use	(3)	
12	Natural resources	(2)	
13	Noise	(1)	
14	Policy instruments	(1)	
15	Soil	(2)	
16	Tourism	(4)	
17	Transport	(45)	
19	Urban environment	(1)	
20	Waste and material resources	(6)	
21	Water	(22)	
SUMMATION		230	

The above discussions lead to conclusion:
There is no specific Model to be copied

**(Indicators ought to be
tailored as per specific needs
and goals)**

4-3-Measuring systems:

Measuring Methods, tools and instruments needed for measuring Environmental performance varies from country to another but the major issue is the carbon dioxide footprint and material recycling, the LCA is one of the systems

“Environmental performance is measured using an evolving, multidisciplinary tool known as life-cycle assessment (LCA).

The general LCA methodology is as follows. LCA begins with goal identification and scoping (defining boundaries). What is the purpose of the LCA? What decision is the LCA meant to support? Where are environmental impact boundaries to be drawn secondary environmental impacts, tertiary impacts? Do we include all environmental impacts, or only a pre-defined subset of impacts?”

The Result or the output of the method is not a deterministic one, it has to be adjusted as per the local existing status and requirements.

Here accuracy and relevancy of input (Data) and the specified goal of the measurement tool directs the results of any index

5-Findings and conclusions:

The research ends with a major conclusion, that indicators from documented data and measurement tools are the second major governing factors of assessment of performance after the performance itself, and they are the major governing factor in directing the future performance and impact on environment if the assessments and indexing systems results were used for planning.

In addition to the major conclusion the paper reached to the following detailed findings and conclusions:

1-Sustainability and responsibility towards Environment is a commitment of Architects all over the world as per declarations of UIA, UNESCO, and AIA

2-Urban Development especially for booming economies and expanding urban settlements should be carefully monitored in terms of its impact on Environment

3-Monitoring can be achieved by using indexes, these indexes can show the direction of development if it is according to specified goals.

4-Solving local severe urban problems should be according to pre specified criteria and goals having less impact on resources

5-Kurdistan Region in general and Erbil City specifically needs to develop legislations that are based on locally oriented criteria towards development with positive impact on Environment and more responsibility against resources

6- Documentation and recording of Data should comply with the international standards in order to prevent in-proper assessments by international indexes

7-Bad rankings in international indexes do represent in-proper performance but not sometimes it is due to in proper or inaccurate data

8- International indexes by definition are to direct the Governments and institutions to wards development, in-proper data will lead to in-proper assessment and guide lines

9-House holds and civil buildings consume more than 75%of the generated power so they bear the responsibility of reducing the impact on Environment, such education needed to be penetrated to the local cultures.

10-Environmentally oriented legislations and building regulations are to be developed locally as per local needs according to local policies

11-Indicators ought to be locally developed to be 1-User-driven 2-Policy-relevant 3-Highly-aggregated

12-Measuring Methods can be adopted as per the local goals taking into consideration that the Result or the output of the method is not a deterministic one, it has to be adjusted as per the local existing status and requirements

13- Accuracy and relevancy of input (Data) and the specified goal of the measurement tool directs the results of any index

6-Recommendations:

1-Develop local data collection and documentation centres on the national level that can provide international institutions with the proper input in order to get assessments that represent the actual status

2-Develop local indexing systems depending on locally oriented indicators that represent the local needs and can be easily understood by decision makers

3-Develop legislations and building regulation with higher awareness regarding Environment and sustainability issues

7- Future research plans:

To start a survey covering local working institutions in Kurdistan Region detecting available assessment tools and methods that can be regarded as measurement tools, and fragmented documentation centres in the Region to check the reliability of the followed documentation procedures.

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