

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



Tehran University of medical Sciences



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# Managing Air Quality - Strategies to Achieve Air Pollution Reduction

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# Introduction

In new estimates released, WHO reports that around 10000 people died in a day as a result of air pollution exposure.

In our country with respect to dust storm phenomenon a population about 40 million people (about half of the total population) are exposed to different levels of air pollution.

# Important Facts on Air Pollution

- ❖ Recently, the International Agency for Research on Cancer ([IARC](#)) has classified outdoor air pollution and the particulate matter (PM) component of outdoor air pollution as carcinogenic to human (IARC Group 1)

# Important Facts on Air Pollution

- ❖ By reducing air pollution levels, we can reduce the burden of disease from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma.

# Important Facts on Air Pollution



## Global estimates of mortality associated with long-term exposure to outdoor fine particulate matter

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- ❖ Ambient (outdoor air pollution) in both cities and rural areas was estimated to cause **8.9 million premature deaths worldwide in 2018**. Some 88% of those premature deaths occurred in low- and middle-income countries

# Important Facts on Air Pollution



GLOBAL AIR POLLUTION ISSUE

**92% of people  
worldwide do not  
breathe safe air**

Join us in breathing life back into our cities and our planet at  
[BreatheLife2030.org](https://BreatheLife2030.org)

**BREATHELIFE**  
Clean air. Healthy future.

 World Health Organization

 CLIMATE & CLEAN AIR COALITION  
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

# Important Facts on Air Pollution

- ❖ In Europe the damage caused by death attributable to air pollution was estimated about 161 billion €
- ❖ Outdoor air pollution, ranks in the top seventh and ninth risk factors in the Middle East and Global, respectively.
- ❖ A decrease of 10  $\mu\text{g}/\text{m}^3$  in the concentration of  $\text{PM}_{2.5}$  was associated with an estimated increase in mean life expectancy of  $0.61 \pm 0.20$  year

# Important key element to Achieve Air Pollution Reduction

# **1) It is Necessary to determine the quantitative targets for comprehensive plans of air pollution control**

Most of [the national air pollution control plans](#) have not been quantitative and clear goals.

Thus, It is necessary for comprehensive plans of air pollution control, all targets should be quantitative, clear, and measurable.

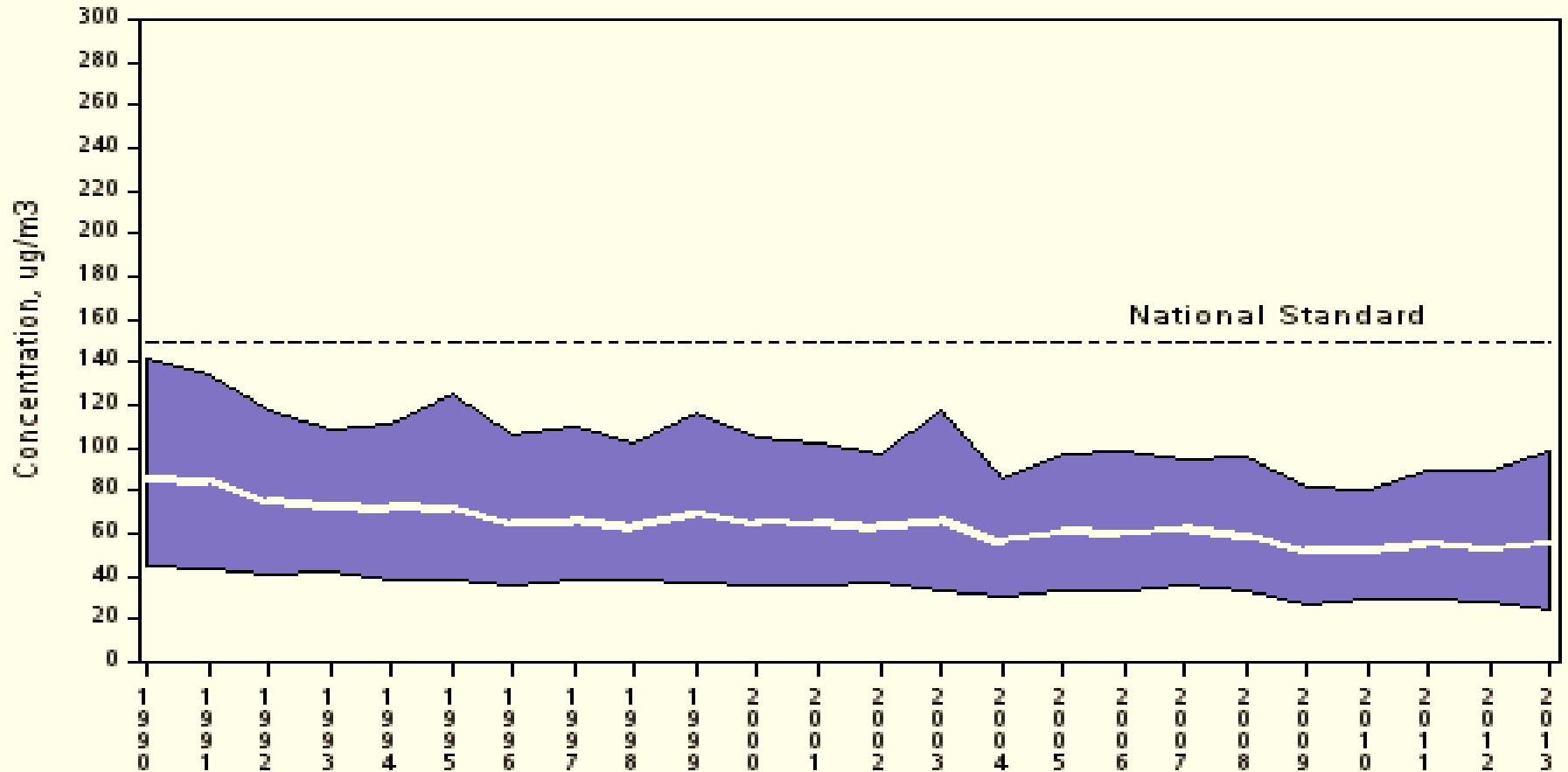
# 1) Necessary to determine the quantitative targets for comprehensive plans of air pollution control

10-15% Decreases in National average of air pollutants (10% for PM and 15% for another pollutants). The Ministry of Health is responsible for working with the DoE to provide annual reports on progress of the plan.

Years of doing program	Annual average SO <sub>2</sub> (µg/m <sup>3</sup> )	Annual average PM <sub>10</sub> (µg/m <sup>3</sup> )
2018 (basic year)	48	85
2019	43	73
2020	39	62
2021	34	53
2022	31	44

# Decreases in National average of air pollutants in [EPA](#)

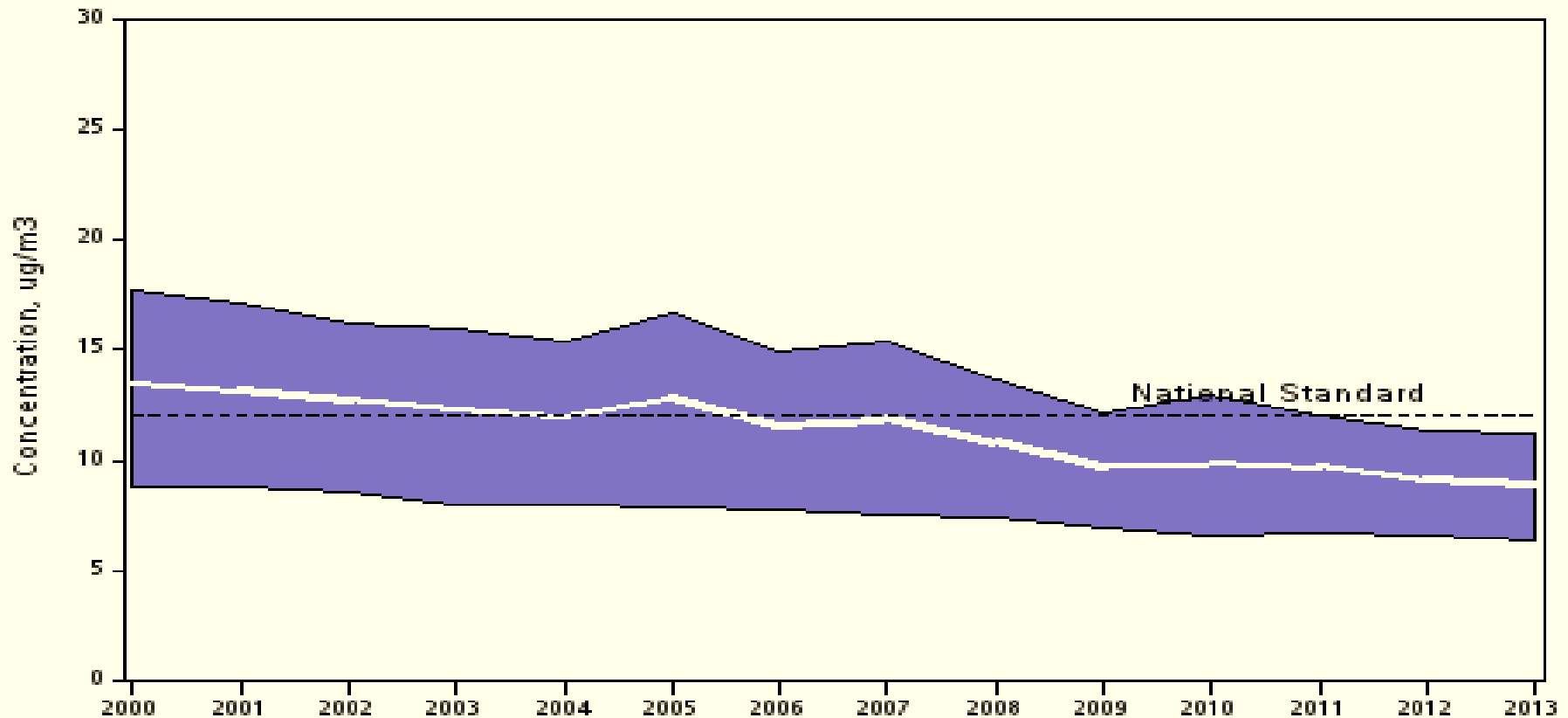
PM10 Air Quality, 1990 - 2013  
(Annual 2nd Maximum 24-Hour Average)  
National Trend based on 207 Sites



1990 to 2013 : 34% decrease in National Average

# Decreases in National average of air pollutants in [EPA](#)

PM2.5 Air Quality, 2000 - 2013  
(Seasonally-Weighted Annual Average)  
National Trend based on 537 Sites



2000 to 2013 : 34% decrease in National Average

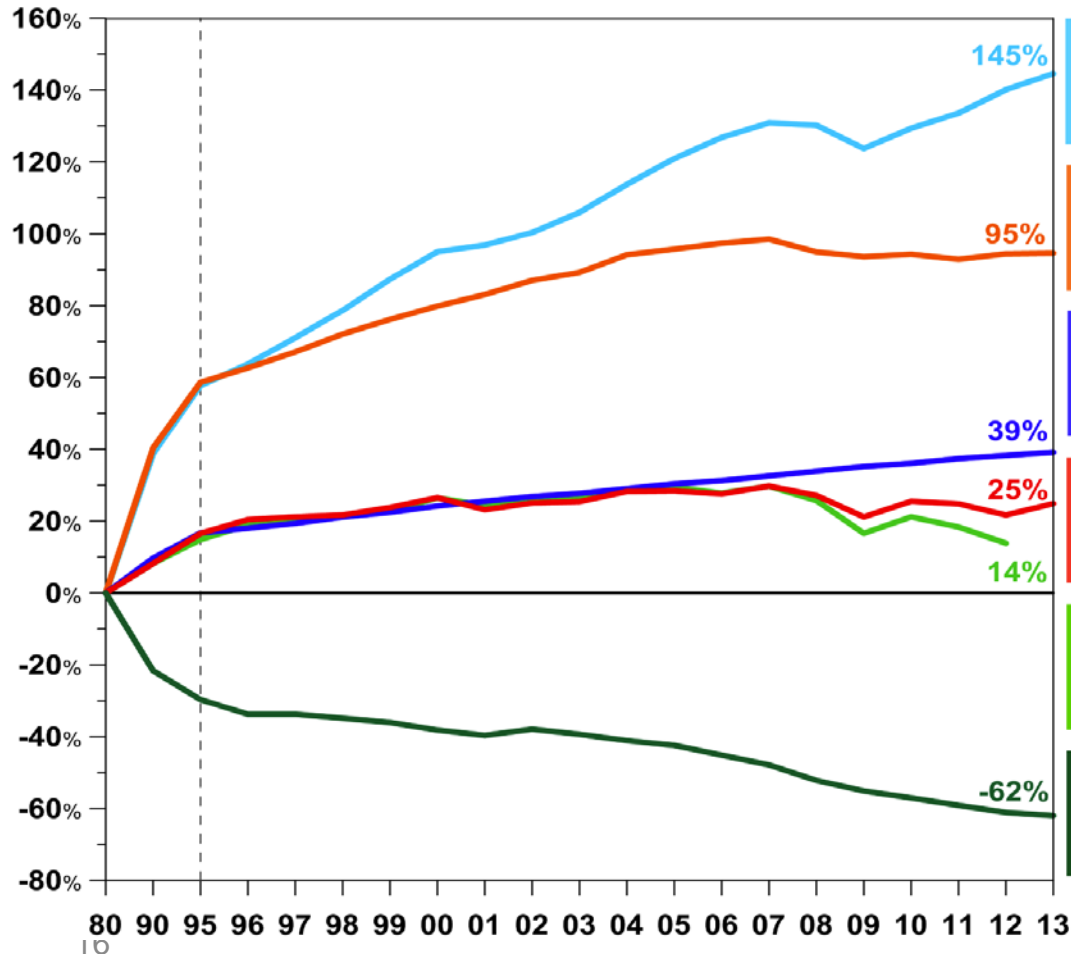
## **2) Note to the economic growth and its impacts on the comprehensive plans of air pollution control**

- ❖ The current plans of air pollution control includes all effective activities and factors to reduce air pollution theoretically and achieving to these theoretical factors will be require to the high economic growth, which is impossible.

## **2) Note to the economic growth and its impacts on the comprehensive plans of air pollution control**

- ❖ **At first, determine a cost-effectiveness of each part of plan and then identify the executive priorities to implementation.**

## 2) Economic growth and air pollution in EPA



Gross Domestic Product



Vehicle Miles Traveled



Population



Energy Consumption



CO<sub>2</sub> Emissions



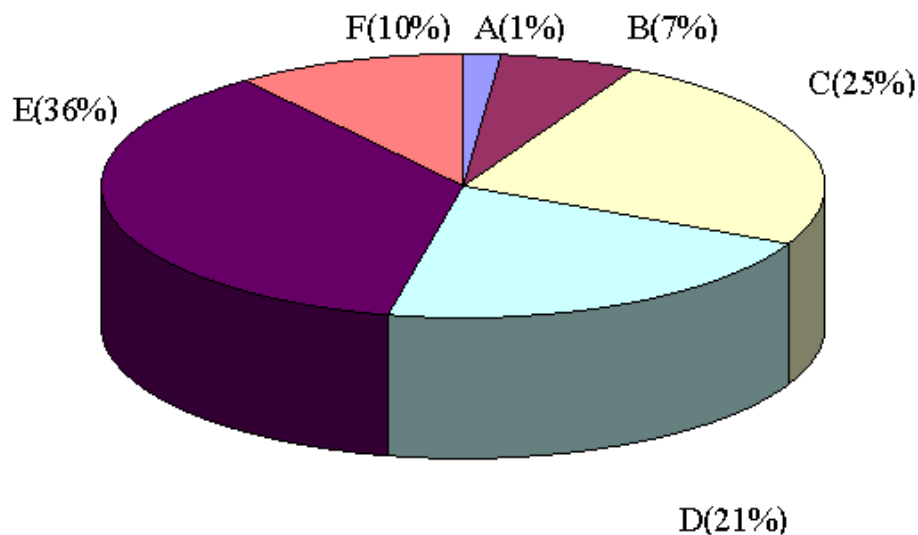
Aggregate Emissions  
(Six Common Pollutants)

### **3) Considering the atmosphere's capacity to accept and dilution of air pollutants**



### 3) Considering the atmosphere's capacity to accept and dilution of air pollutants

- ❖ Determining the atmosphere capacity of industrial and megacities and its application in comprehensive plans of air pollution control is necessary.



#### 4) Provide an emission inventory

- ❖ Emission inventory is one of the important key element of air pollution control plans in the world.
- ❖ Undoubtedly there are not any successful air pollution control plans without the emission inventory.

#### 4) Provide an emission inventory

- ❖ Emission Inventory must be developed in industrial and mega cities and use for priority of the all components of air pollution control plans.
- ❖ It should be noted that the Emission Inventory is not be a part of the comprehensive air pollution control plans, but the plans should be developed based on the Emission Inventory.

## **5) Considering the Environmental management plans**

- ❖ Comprehensive Air Pollution Control Plan should be consider framework of "Environmental Management Plan", that is produced with the cooperation and participation of stakeholders comments.

## 5) Considering the Environmental management plans

❖ All components of the air pollution control plan should be separated to clear and specific activities, sub-activities and these activities should have:

1. Responsible For Implementation,
2. Index or Indicator
3. Cost
4. Funding Sources
5. Implementation Time
6. Monitoring Administrator and Reporting
7. Monitoring procedures

## **6) National Standards for Clean Air**

- ❖ According to World Health Organization strategic plans, it is better that clean air standards developed based on WHO guidelines.
- ❖ The Iranian national clean air standard was the same as WHO guidelines but last year changed.

## 6) National Clean Air Act

- ❖ The "WHO Air quality guidelines" provide an assessment of health effects of air pollution and thresholds for health-harmful pollution levels
- ❖ WHO air quality guidelines are the best source for establishing of national clean air standards.

## **7) Do not increase the current emissions**

- ❖ The Comprehensive air pollution control plan should not be add a new pollutant to the current status.
- ❖ The improve quality of fuel and more complete combustion, the more emission of NO<sub>x</sub> in the atmosphere, which is one of the precursors of ozone.
- ❖ Finally, if ignoring this important key elements, the components of air pollutants changed and air pollution problem will not be solved properly.

## **7) Do not increase the current emissions**

- ❖ Selection of all components of the comprehensive air pollution plan should be based on not increase the another pollutants.

## 8) Public Awareness of Air Pollution

- ❖ People can reduce their exposure to air pollution by checking their daily air quality forecast and adjusting strenuous outdoor activities when an unhealthy [AQI is forecast.](#)

## 9) Involving the Stakeholders



## 9) Involving the Stakeholders

### Advantages of participation

- Better trust in decisions
- Improving project design using local knowledge
- Better understanding projects and issues
- Integration of various interests and opinions
- Public acceptance of the decisions

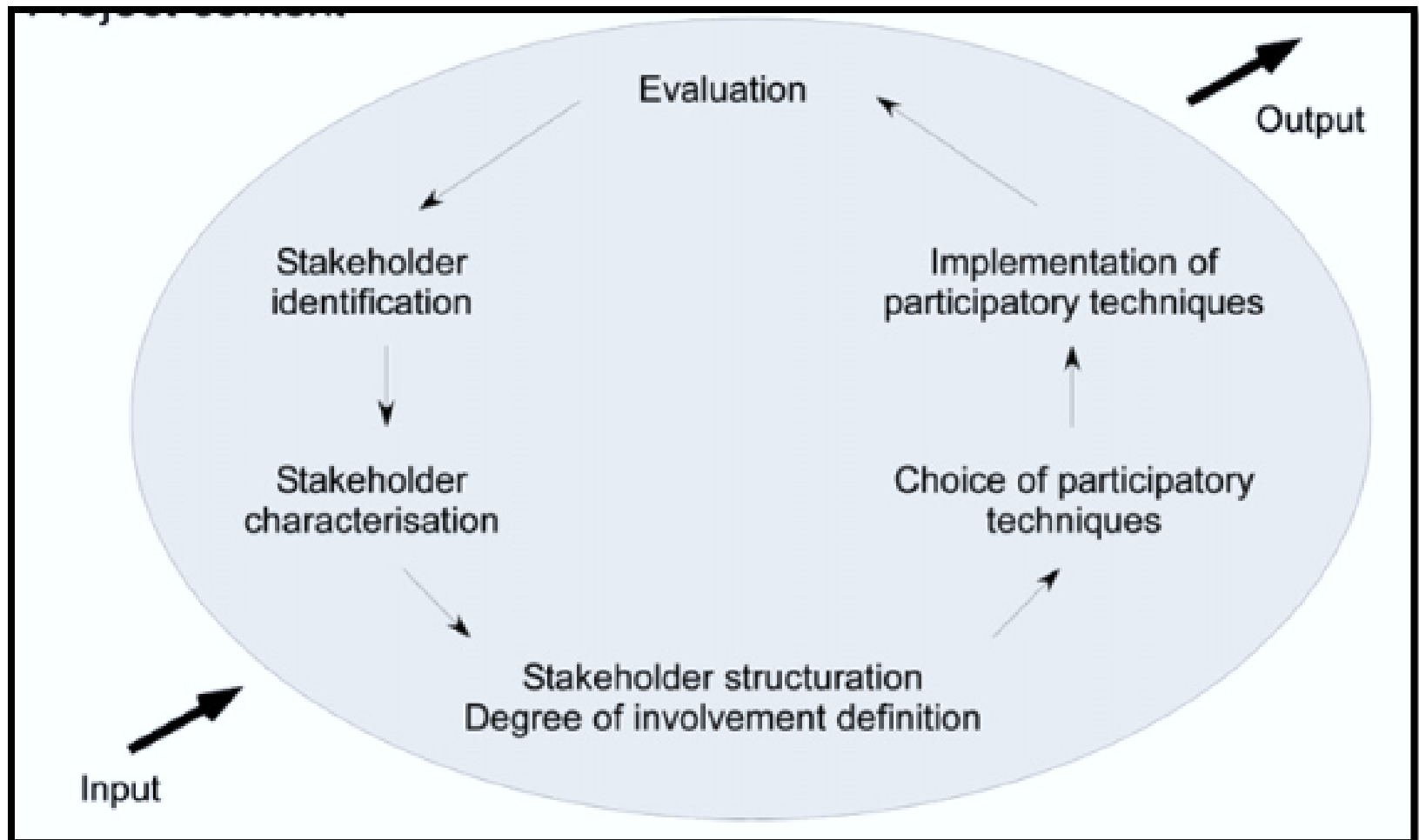
## 9) Involving the Stakeholders

### Representative Types of Stakeholder:

- Public Sector
- Private Sector
- Popular or Community Sector
  - Non-Government Organizations (NGOs)
- Other
  - Universities, colleges, higher education,
  - Media

## 9) Stakeholder participation

Proposed framework for stakeholder participation



**10) Using experts, universities and research centers capacity**

**11) NGO Collaboration**

# How Have Air Pollution Policies Extended Lives?

## China: National Air Quality Action Plan (2013) China's War on Pollution Has Cut Smog by 12%

After three years fighting a "War on Pollution," China is seeing improvements. If these improvements are sustained, people in China could see their life expectancy increase by nearly 0.5 years.

→ [Learn More](#)



# How Have Air Pollution Policies Extended Lives?



Mexico City: ProAire (1990)

Pollution is down 57% in the city  
once renamed “Makesicko City.”

The ProAire policies have allowed residents to live more than two years longer.

[→ Learn More](#)



**Thanks for Your Attention**