INDIA'S QUEST FOR SUSTAINABLE DEVELOPMENT: ECONOMIC, SOCIAL, AND ENVIRONMENTAL DIMENSIONS: AN OVERVIEW

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Key Environmental Challenges in India

- India's key environmental challenges relate to the nexus between environment and poverty, and economic growth
- At present c. 20% of disease burden in India is directly linked to environmental degradation, and several environmental health factors – e.g. lack of access to clean water/energy
- Intrinsically connected with state of environmental resources – land, water, air, flora and fauna
- Proximate drivers are: population growth, inappropriate technology and consumption choices, and poverty, leading to changes in relations between people and ecosystems, and development activities e.g. intensive agriculture, polluting industry, unplanned industrialization
- However, these factors give rise to environmental degradation through institutional failures – lack of clarity or enforcement of access rights, perverse fiscal policies, market (or regulatory) failures, governance constraints

Environmental challenges…

- Environmental degradation is a major factor in enhancing poverty when soil fertility, water (quantity and quality), air quality, forests, fisheries, and wildlife, are affected
- Women are particularly affected, given their role in collection and use, but not management, of environmental resources
- Poor are vulnerable to loss of resilience (capacity to withstand natural or manmade shocks) in ecosystems, due to loss of genetic diversity
- Urban environmental degradation – lack of sanitation/wastewater treatment, industry and transport related pollution, differentially affects the poor (more exposed in home/workplace), leading to loss of employment, schooling, financial stress for medical treatment.

Environmental challenges…

- Multilateral environmental challenges – climate change, biodiversity loss, ozone depletion – need to ensure that global treaties do not place constraints on country's development, but enhance economic opportunities. Our approach to these issues is premised on the principle of "*common but differentiated responsibilities*" of countries, and *equal per-capita sharing* of global environmental resources.

India's Policy, Legal, and Regulatory Structures to address environmental concerns

- The present policy/legal/regulatory structure for the environment are contained in:
- National Forest Policy, 1988
- Forest Act 1927, Forest Conservation Act 1980
- Wildlife Protection Act, 1972
- Environment Protection Act, 1986
- Water (Prevention and Control of Pollution Act), 1974
- Air (Prevention and Control of Pollution) Act, 1981

Policy, Legal and Regulatory Structures…

- The National Environment Policy, 2006
- In addition, various sector policies, such as National Agriculture Policy, 2000; National Population Policy, 2000; National Water Policy, 2002, have important bearing on environmental outcomes
- *The question is, have these policies and laws/regulations "worked"?* I will answer this in the later part of this presentation

Sustainable Development

- India's National Environment Policy, 2006 is premised on sustainable development, not environmental protection in isolation from the broader development context:
- **Definition**: *"First, that human beings should be able to enjoy a decent quality of life; second, that humanity should become capable of respecting the finiteness of the biosphere; and third, that neither the aspiration for the good life, nor the recognition of biophysical limits should preclude the search for greater justice in the world"*.

Objectives

- To protect and conserve critical ecological systems and resources
- To ensure intra-generational and inter-generational equity
- To integrate environmental concerns in economic and social development
- To ensure efficiency in environmental resource use
- To apply principles of good environmental governance
- To enhance resources for environmental conservation

Strategies and Actions

Regulatory Reforms (in the legislative framework and regulatory institutions)

- Revisiting the legislative framework
- Process related reforms:
  - Approach
  - Framework for legal action

Strategies and Actions…

- Substantive reform in:
  - Environment and forest clearance procedures
  - Coastal areas management
  - Living Modified Organisms (LMOs) processes
  - Environmentally Sensitive Zones Management
  - Monitoring and enforcement
  - Use of economic principles in decision making

Strategies and Actions…

- Enhancing and Conserving Environmental Resources in :
  - Land degradation
  - Forests
  - Wildlife
  - Biodiversity, Traditional Knowledge, and Natural Heritage

Strategies and Actions…

- Fresh Water Resources-
  - River Systems
  - Groundwater
  - Wetlands
- Mountain Ecosystems
- Coastal Resources

Strategies and Actions…

- Pollution Abatement
  - Air
  - Water and
  - Soil
- Conservation of Manmade heritage
- Climate Change

Strategies and Actions…

- Environmental Standards, Management Systems, Certification and Indicators
  - Environmental Standards
  - Environmental Management Systems, Eco-labeling and Certification
- Clean Technologies and Innovation
- Environmental Awareness, Education and Information
- Partnerships and Stakeholder Involvement

Review of the Policy

- Consultations with groups of diverse stake holders would be undertaken every three years for updating

- Comprehensive examination in the third of the three years reviews

Societal standards setting

- Societal resources are fungible and may be used for different purposes
- The approach must be to consider a range of societal risks collectively, in the sense that it is pointless to spend large resources on small risk from one source, and few resources on large risk from others
- A formal approach would equate the unit costs of risk reduction from different sources to maximize risk reduction across society as a whole for a given level of societal resources => *as a society becomes richer, it can afford more stringent standards!*

Regulatory instruments and means of enforcement

- Traditionally, environmental regulation has relied upon a fiats based, criminal penalties oriented system for violations
- What are the problems with this approach?
- Costs of compliance may be excessive because regulatees cannot realize opportunities for cost-reduction in meeting standards; in particular, prescribing particular abatement technologies may be unnecessarily costly

Regulatory instruments…

- Evidentiary requirements for criminal prosecutions cannot generally be met in environmental violation situations
- What are alternative approaches?
- Incentive based (or "economic" instruments)
- Greater reliance on civil liability, as opposed to criminal prosecutions

Civil Liability

- Greater reliance on civil liability may involve lower evidentiary burdens than criminal prosecutions
- Enables compensation for impacted population
- Both “fault-based” and “strict liability” may be applied
- Currently based on jurisprudence rather than environmental statute

Environmental monitoring

- Traditionally monitoring done exclusively by centralized public agencies
- Reason: requires scientific skills, independence from regulatee
- Problems: "Regulatory capture" by regulatee; major stakeholders the potentially impacted **local** publics

Alternative approaches

- Decentralize to public agencies having necessary scientific capability and spatial jurisdiction at levels at which impacts may occur
- Partial responsibility to local public agencies for monitoring mandated environmental management plans (which may require lesser scientific capacities)
- Possibilities of multistakeholder partnerships between independent monitoring agency, local governments, and regulator

Corporate social responsibility

- Programme: Corporates voluntarilty undertake environmental protection measures beyond legal regulatory requirements under the " Corporate Responsibility for Environmental Protection " (CREP) programme
- May relate to abatement of their own pollution below prescribed standards; and/or environmental conservation in the local area more generally
- Benefit: Improved corporate image; increased employee motivation; greater support of local communities

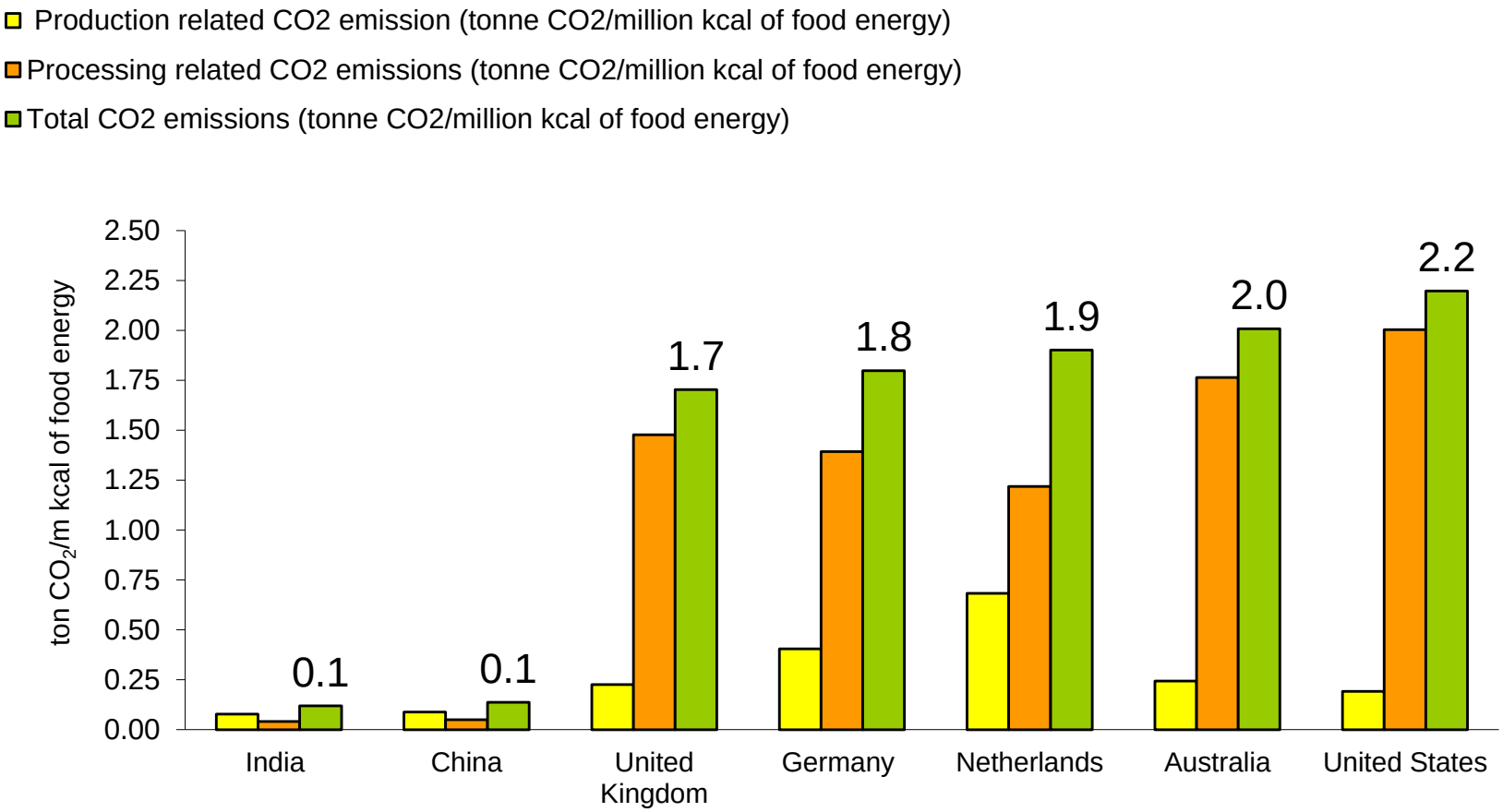
Public awareness

- If population does not internalize environmentally responsible behaviours, societal costs of clean-up may be excessive; regulatory systems may be overwhelmed
- **Analogy**: moral sense among people enables law and order burden to be manageable
- Environmental education from primary school levels, media campaigns, are accordingly a major component of environmental policy

Life styles

- Sustainability outcomes depend not only upon policies and regulations, but also upon lifestyles
- We look at some indicators of lifestyles having a bearing on sustainability, irrespective of income levels:

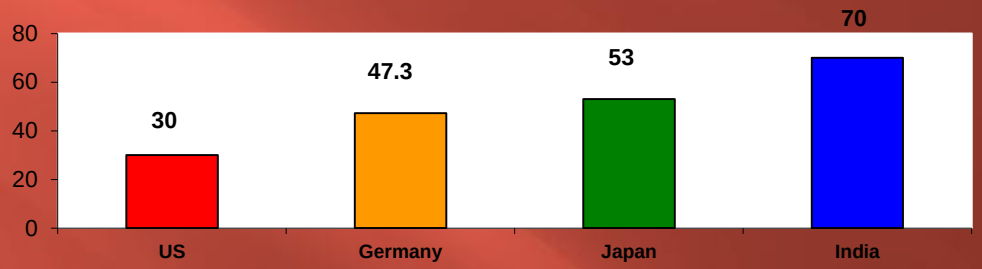
CO_2 emission from food sector--from Field (production) to Table (processed food)-*excluding cooking*



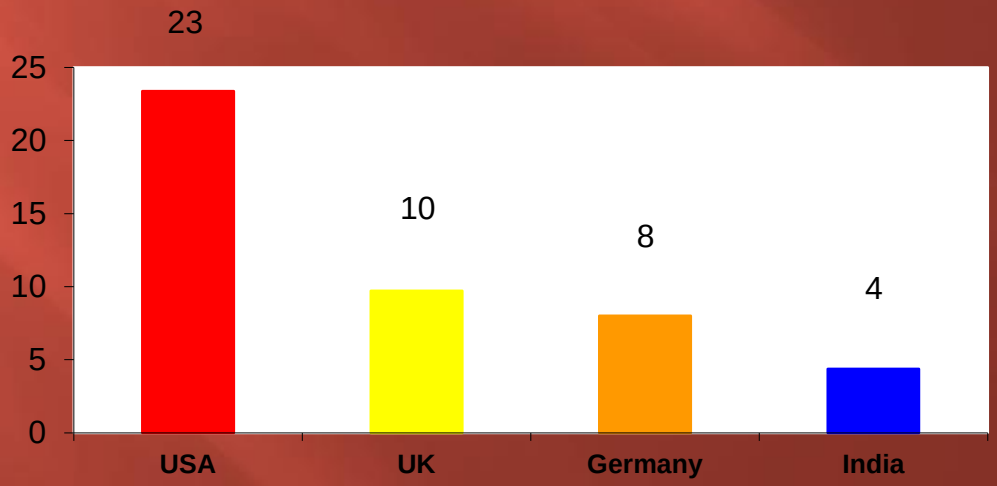
Source: TERI analysis (various data sources)

Municipal solid waste

Average rate of recycling (%) (excl. re-use)

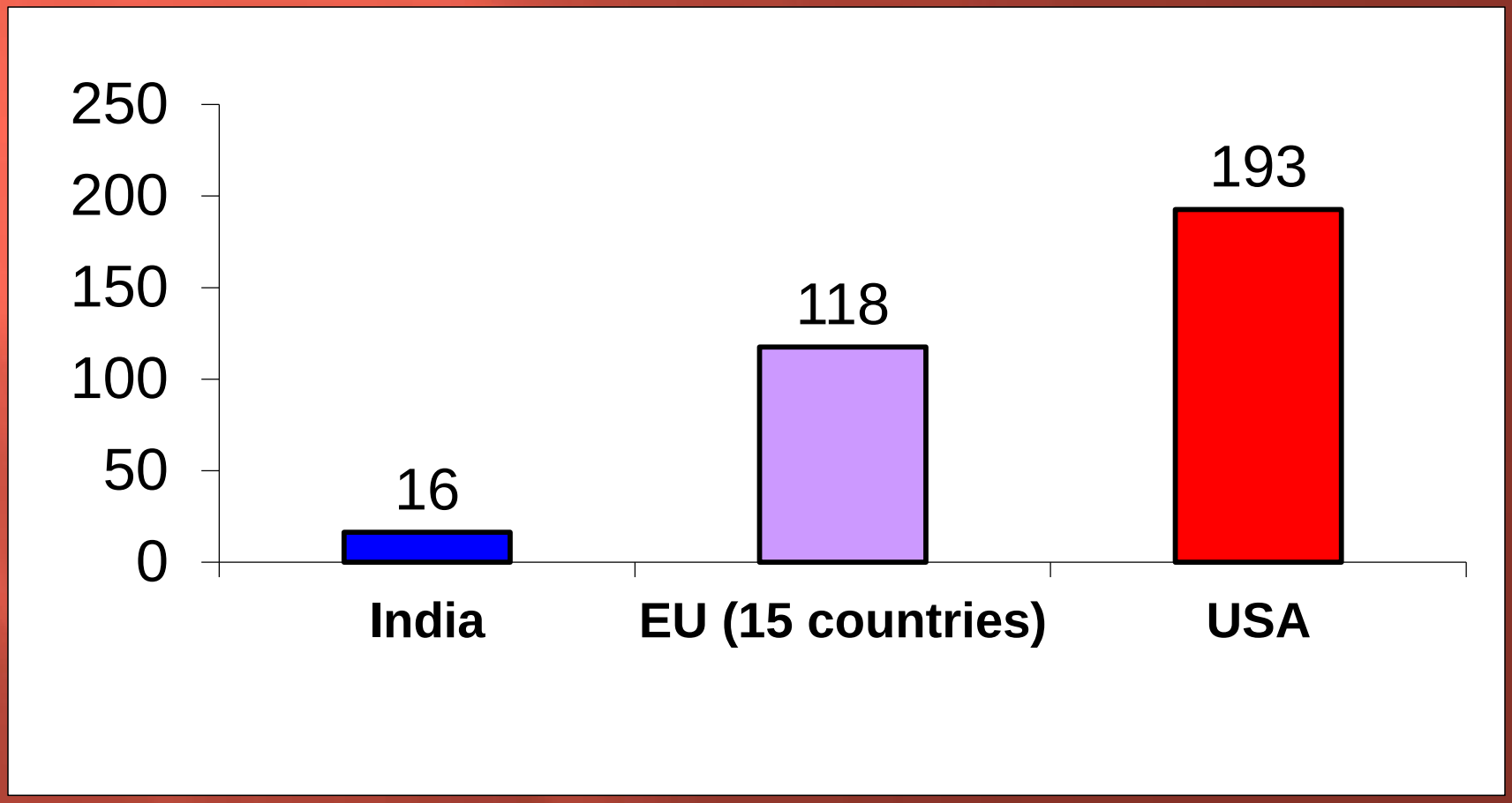


GHG emissions from waste (gm/'000$GDPppp)



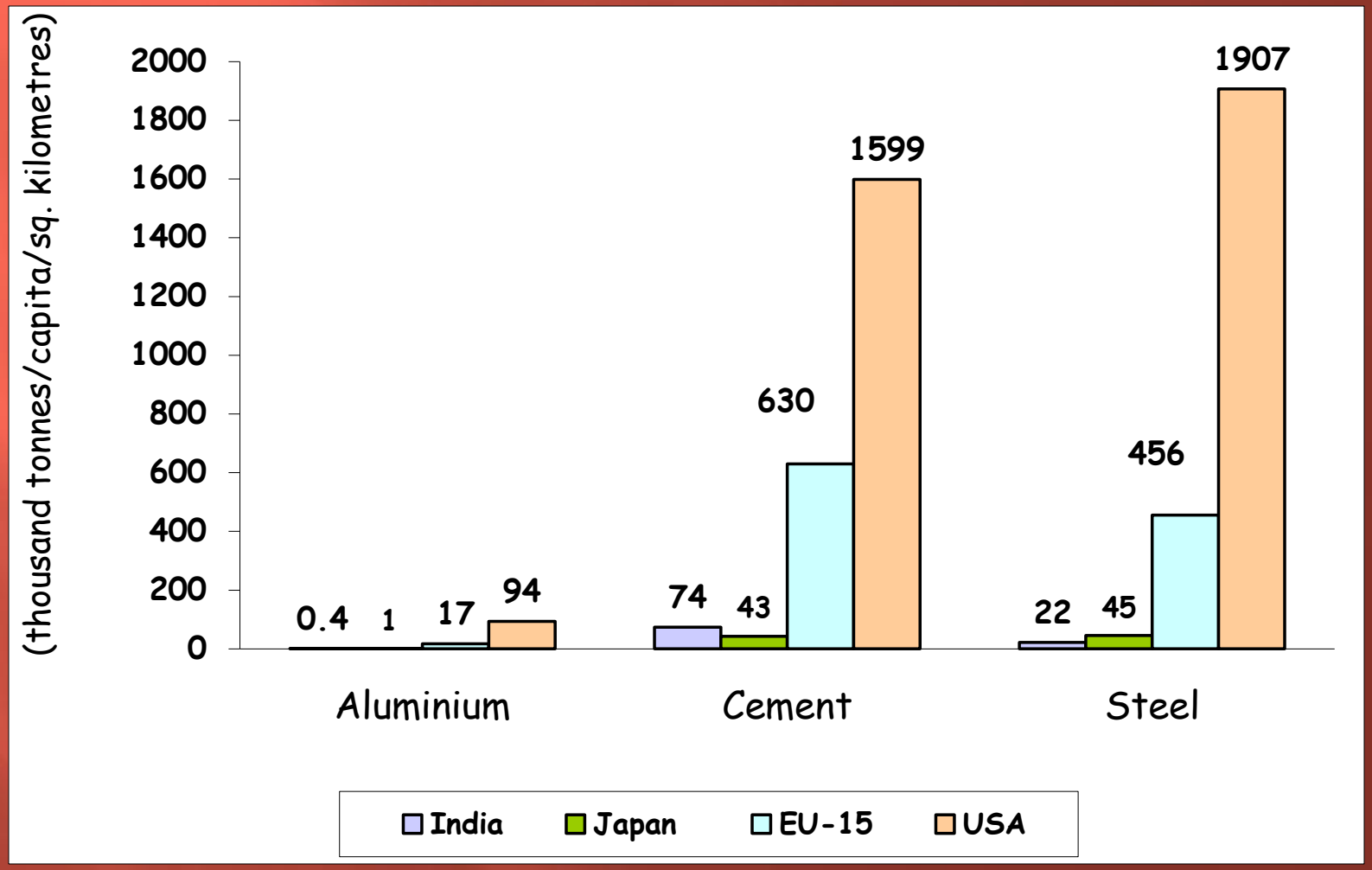
Source: TERI Analysis, based on National Communications of different countries

Estimated CO_2 emissions from passenger transport (gm/passenger-km)



Source: TERI Analysis, various data sources

Per-capita consumption of construction materials per-unit of inhabited land area



Greendex

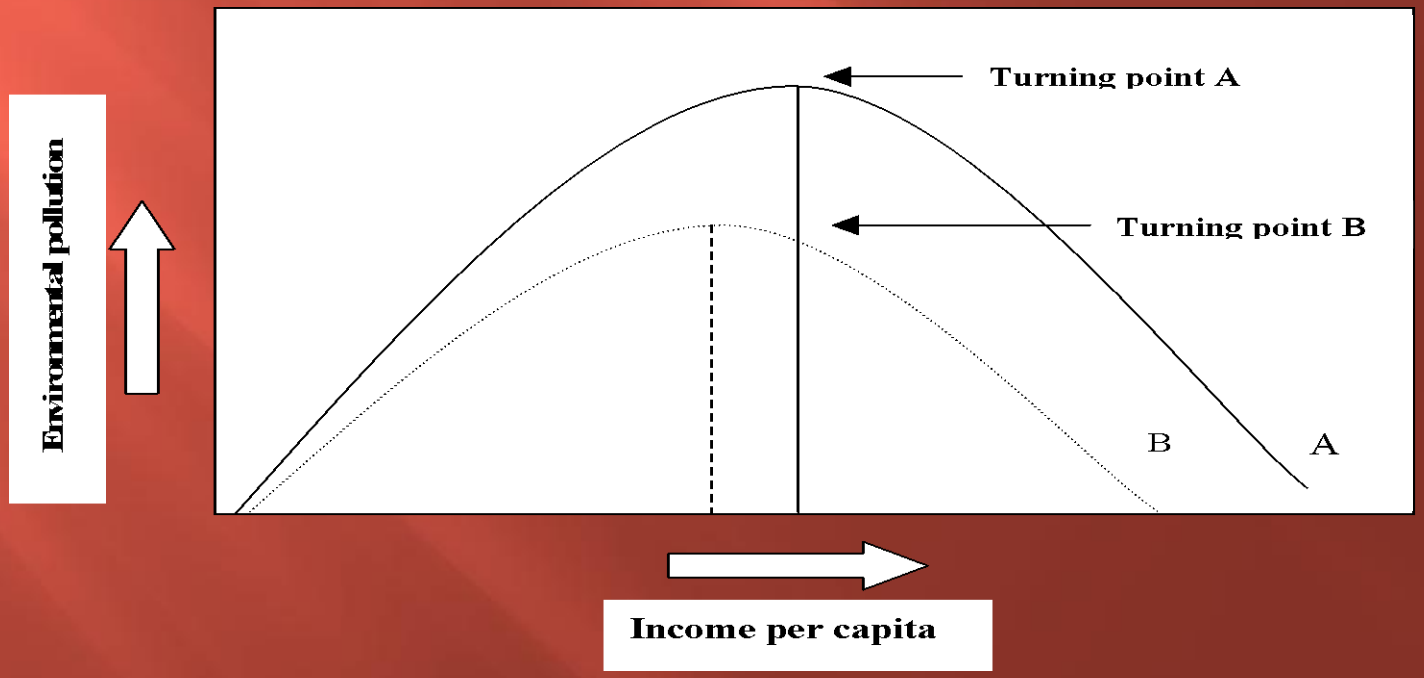
- The *National Geographic* has, since 2008, been evaluating several countries on the sustainability of life styles.
- In the first evaluation (2008), India tied with Brazil for the first place
- In all the subsequent evaluations (2009-2012), India was ranked No. 1.

Environmental Kuznets curve

- Is India doing better or worse than currently developed countries when they were at comparable levels of development
- To answer this, we look at statistical estimates of the Environmental Kuznets curve for several environmental parameters in case of India
- Environmental Kuznets curve: Empirical relationship showing that during economic growth, environmental parameters at first worsen, and then improve
- The historical turning point for currently developed countries is $ 6000-8000 per-capita in PPP terms

What is EKC

- An inverted U shaped relationship between various environmental indicators and levels of economic growth
- Initial stages of economic growth can lead to environmental degradation. Later stages, improvement due to demand for better environment, government initiative, shifts in technology, etc.



Air pollutants - turning points

	Countries	SO2	SPM	NOx
MK*	India		$523	
CRB*	11 OECD	$6,900	$7,300	$14,700
GK1*	Upto 32 countries	$4,107		
GK2*	Upto 32 countries	$4,053		
P1*		$3,000	$4,500	$5,500
P2*	30 developed and developing	$5,000		
SS*	22 OECD and 8 developing	$10,700	$9,600	$21,800
SB*	31 countries	$3,670	$3,280	
This study	**India (ind, trans and res)****	**$1,695**	**$1,640**	**$1,707**
		$957	**$1,440**	**$1,413**
		$1,752	**$1,840**	**$1,770**

MK= Mukherjee and Kathuria (2006)
CRB= Cole et al (1997)
GK1= Grossman and Krueger (1993)
GK2=Grossman and Krueger (1995)
P1= Panayotou (1995)
P2= Panayotou (1997)
SS= Selden and Song (1994)
SB= Shafik and Bandhopadhya (1994)
* in 1985 US $
**industrial, transport and residential sectors, respectively
for the study by MK, a composite index of pollution including 63 environmental indicators has been used as the dependent variable

EKC U

Water pollutants - turning points

	Countries	BOD	COD	Wastewater
MK*	India		$523	
GK*	Upto 32 countries	$7,623	$7,853	
CSB*	India	$2,369		
NP**	India	$65		
This study	**India**	**$548 and $ 2,388**	**$1,668**	**$3,150 (CI cities) $1,694 (CII cities)**

MK= Mukherjee and Kathuria (2006)

GK=Grossman and Krueger (1995)

CSB= Chandra Sahu and Bali (2006)

NP= Narayanan and Palanivel (2003)

*in 1985 US $

** in constant 1995 US $

for the study by MK, a composite index of pollution including 63 environmental indicators has been used as the dependent variable

	EKC		N		U

Forests - turning points

	Global	Latin Amercia	Africa	Asia	India
MK*					$523
AH*	$2,049				
CG*		$5,420	$4,760		
P*	$823				
C **		$2,097			
BH***		$6,600	$1,300 & $ 5,000	$2,200 & $5,500	
KT****	$501	$1,537	$1,510	$797	
This study					**$1,955 & $2,988**

MK= Mukherjee and Kathuria (2006)
AH= Antle and Heidebrink 1995
CG= Cropper and Griffiths 1994
GK2=Grossman and Krueger (1995)
P= Panayotou (1995)
C= Culas (2006)
BH= Bhattarai and Hammig (2001)
KT= Koop and Tole (1999)
* in 1985 US $
** in 1995 US $ (at market prices)
*** in PPP 1985 US $
****adjusted to a common set of international prices
for the study by MK, a composite index of pollution including 63 environmental indicators has been used as the dependent variable

EKC | N | U | Inverted N

Turning points for per capita forest cover are $ 1,330 and $ 5,302

Conclusion:

- India still has a long way to go in ensuring sustainable development, broadly defined
- However, despite strenuous attempts by various quarters, to portray India as environmentally irresponsible, a careful reading of the facts reveals otherwise
- International comparisons show that India has generally done better than currently developed countries *at comparable stages of their development*
- This is to be attributed to policies, laws, regulation, and the inherent sustainability of India's cultural norms

Thank You for Your Attention!