

The Keeling Curve : latest reading 413.51 ppm.
June 26, 2019

Ice core : Cylindrical blocks dug out of the ice frost region (permanent frost)

Traps small air pockets → measure CO₂

* Ice ages in last 800,000 years.

CO₂ and temp correlated

CO₂ ↑ temp ↑

* Cement is emitter of CO₂
 → look for alternative

APPOINTMENTS

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Evidences of Global Warming

(1) Shrinking of ice sheets : The Greenland and Antarctic ice sheets have

decreased in mass. Data from NASA's Gravity Recovery and Climate Experiment show Greenland lost an avg of 286 billion tons of ice per year between 1993 and 2016, while Antarctica lost about 127 billion tons of ice per year during the same period.

PHONES

(2) Declining Arctic sea ice : Both the extent and thickness of Arctic sea ice has declined rapidly over the last several decades.

(3) Extreme events : The number of record high temp events in the US has been increasing, while the number of record low temp events has been decreasing since 1950, the US has also witnessed inc numbers of intense rainfall.

(4) Ocean acidification : Since the beginning of the Industrial Revolution the acidity of surface ocean water has inc by about 30 percent. This is the result of human emitting more CO₂ into atmosphere and hence more being absorbed into the oceans. The amount of CO₂ absorbed by the upper layer of the oceans is increasing by about 2

AUGUST 2011							SEPTEMBER 2011						
Wk	S	M	T	W	Th	F	Wk	S	M	T	W	Th	F
32		1	2	3	4	5	32		1	2	3	4	5
33	7	8	9	10	11	12	33	7	8	9	10	11	12
34	14	15	16	17	18	19	34	14	15	16	17	18	19
35	21	22	23	24	25	26	35	21	22	23	24	25	26
36	28	29	30	31			36	28	29	30	31		

→ Development that meets the needs of the present without compromising the ability of future generation to meet their own needs.

1987 report of the World Commission on Environment and Development (WCED)

APPOINTMENTS

09 Definition of Development: GDP [Gross Domestic product]

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GDP measures the monetary value of final goods and services - i.e. those that are bought by the final user - produced in the country in a given period of time.

Measurement of throughput of natural resources.

Challenges to Sustainable Development

- rising income inequality (Economic Kuznets curve)
- Environmental degradation (Environmental Kuznets curve)

Economical Kuznets Curve: Refers to relating growth and income redistribution.

Environmental Kuznets Curve: Refers to relating growth & environment

How to measure sustainability?

For the case of development - Sustainable growth

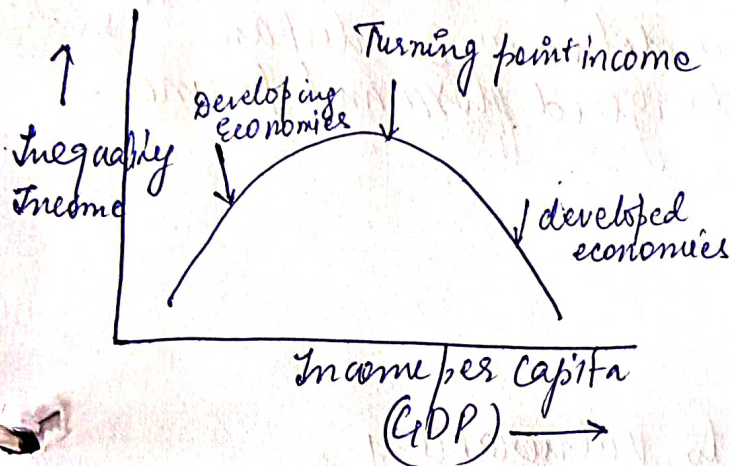
for the case of environment - environmental sustainability

- For the case of development - Sustainable growth
 For the case of environment - Environmental sustainability
- Environmental sustainability requires that we don't consume non-renewable resources, in such a scenario, GDP should be close to zero.
- Sustainable growth & Environmental Sustainability

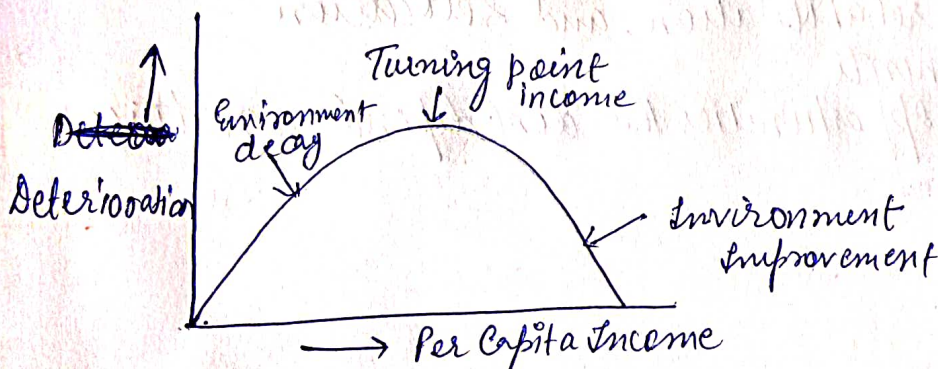
JUNE 2011							JULY 2011							
WK	S	M	T	W	T	F	WK	S	M	T	W	T	F	S
23				1	2	3	27	31					1	2
24	4	5	6	7	8	9	28						3	4
25	10	11	12	13	14	15	29	10	11	12	13	14	15	16
26	16	17	18	19	20	21	30	17	18	19	20	21	22	23
27	22	23	24	25	26	27	31	24	25	26	27	28	29	30

Why do we use GDP as a metric for overall improvement in human life?

Simon Kuznet → American Scientist
 - Introduced GDP
 - Kuznet Curve



} Economy Curve



} Environmental Kuznets Curve (EKC)

SUNDARBAN'S VANISHING SHORES

Case study - 1

Sundarbans a low lying mangrove forest ~~situated~~ on the stretches the coast of Bangladesh and some of West Bengal in India. World's largest block of Mangrove forests. (Single) in the delta formed by 3 large rivers Brahmaputra, meghna and Ganga.

↓ major rivers residing in Bangladesh stretch (exclusively)

- Sunderban National Park
- Sunderban West and East Wildlife Sanctuaries
- ^{South} Sainakhali Wildlife Sanctuary.

~~ENV~~ Environmental Reader for University [for case study]

Amazon buy

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UNESCO world heritage sites

In Sunderbans rising sea level have turned farms into wasteland threatening to displace millions.

- (1) Sunderban's in Indian range is also evacuating, causing huge loss to livelihood
- (2) Enundation of Bangladesh side, that will trigger refugees to come to India from Bangladesh. (The burden on Indian govt) ^{Intensifies the political matters b/w Bangladesh & India}
- (3) Ecological consequences of enundation as Sunderban is the home to critically endangered flora and fauna.
(Timber giving plantation), tigers.

Elevation of Sunderbans

6 m above sea level

Solutions

- zoning according to vulnerability.
- Planning, rehabilitation, and relocation
- embankments
- Creating opportunities that don't depend on nature.