

PES – Opportunities for climate change mitigation role of forests

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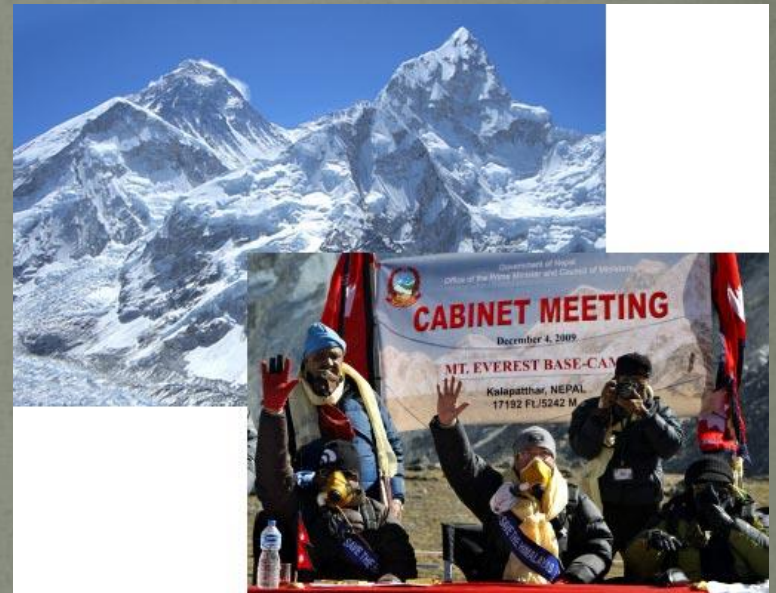
Sandeep Berwal

What's happening here?



Cabinet meeting in Maldives and Nepal!

– A sign of showing the impact of climate change on Small Nations.



Tell me what they did?

- There is a small Island nation called Kiribati whose existence is under the threat of rising sea level.
- Tell me what they tried to do? To maintain their existence. They did something unique!



Climate change Refugees!

football opinion culture business lifestyle fashion environment tech travel

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Besieged by the rising tides of climate change, Kiribati buys land in Fiji

Nation finalises purchase of land on Vanua Levu, 2,000km away, but it may be just the first of many seeking refuge



On Kiribati, an abandoned house that is affected by seawater during high tides. Photograph: David Gray/Reuters

The people of Kiribati, a group of islands in the Pacific ocean particularly exposed to climate change, now own a possible refuge elsewhere. President Anote Tong has recently finalised the purchase of 20 sq km on Vanua Levu, one of the Fiji islands, about 2,000km away.

So, Only small island nations are seeing the impact? NO!



Chennai floods echo at Paris climate meet

By [Urmi Goswami](#), ET Bureau | 5 Dec, 2015, 07.04AM IST

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PARIS: The incessant rains in Chennai have become part of the discussions thousands of miles away in the Paris suburb of Le Bourget, where diplomats and officials from over 190 countries are working on finalising a new global regime to tackle climate change. French foreign minister [Laurent Fabius](#), the chair of the global negotiations, expressed his solidarity with those affected by the tragedy inflicted by the torrential rainfall. "Flooding in Chennai has taken a tragic toll. I want to express solidarity with those affected by this tragedy," he said.

For Fabius the rains in Chennai, which has already received twice the amount of rainfall it receives in December, marks yet another stark reminder that the world must act

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Ripples in Paris after devastating floods in Chennai

French Foreign Minister Laurent Fabius, who is presiding over the conference, issued a statement expressing his country's solidarity with the affected people of Chennai.

[Amitabh Sinha](#)

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Paris

ABOUT AUTHOR



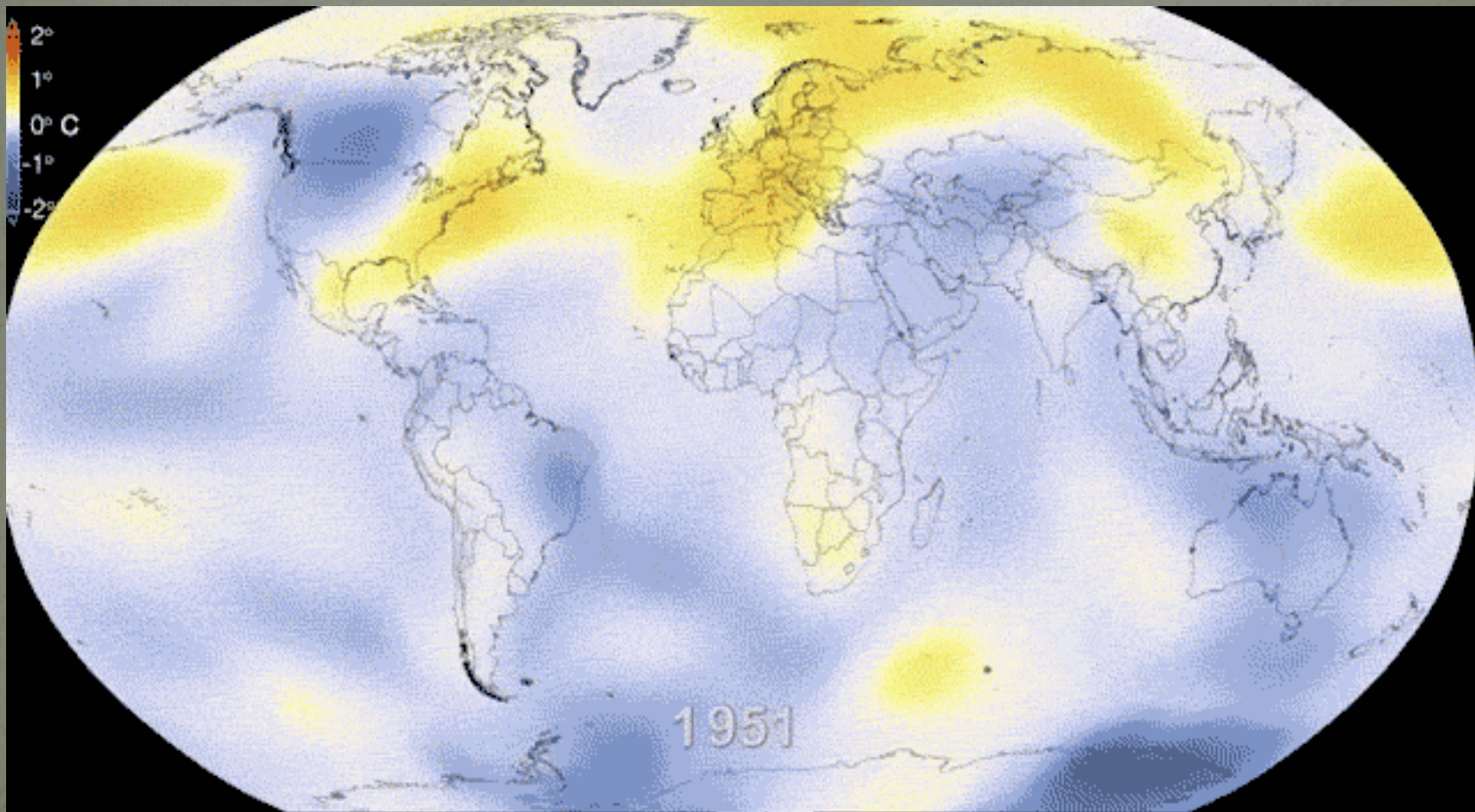
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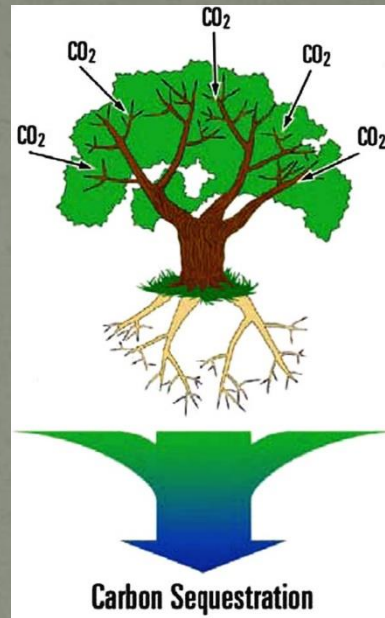


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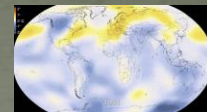
So, The climate change is real now!





What can
be a
solution
to this?

- Through PES, We can implement C-Sequestration as a financially viable means to aid climate change mitigation through forestry.



What is Carbon Sequestration?

- Carbon sequestration refers to a long-term storage of carbon dioxide or other forms of carbon to either mitigate or defer global warming and to avoid dangerous climate change.
- It has been proposed as a way to slow the atmospheric and marine accumulation of greenhouse gases, which are released by burning fossil fuels.

How it sequesters carbon?

- As a result of photosynthesis carbon dioxide is removed from the atmosphere and stored in biomass. This is a part of the carbon cycle known as **carbon sequestration**.
- **The carbon** that is taken from the air is incorporated into sugars (such as glucose), that become the **building blocks for production of wood**.
- Trees and wood are **carbon sinks**, accumulating carbon as they grow and acting as stable carbon stores upon maturity.
- This carbon storage applies **even when trees are converted to Timber**. Considerable carbon is stored in wood put into long-term use such as in houses, furniture, and books. When trees die or succumb to fire, their stored carbon is released back into the cycle through decay and combustion.

Ways - Carbon sequestration by forests

- Carbon sequestration by forests is **recognized as one way of mitigating industrial emissions of CO₂.**
- Managing forests to reduce carbon dioxide emissions and to increase carbon sequestration is possible through the following approaches
- **Afforestation:** converting non-forest lands to forests (i.e. tree planting on lands previously used for marginal crops)
- **Reforestation:** planting trees on lands previously used in forestry (i.e. re-planting quickly after a fire)
- **Forest preservation:** keeping forests as forests
- **Forest Management:** strategies such as thinning or increasing length of rotations (the period of time between harvests) to minimize risk of catastrophic fire.

Forest management activities that conserve carbon stocks in forests include:-

- I. sustainable practices of forest management and use;
- II. integrated fire management;
- III. management of forest health and vitality;
- IV. management of forest biodiversity;
- V. management and extension of protected areas.

• “No more global warming, if everyone plants forest,” he says. Not just saying but working towards that also!



The man who made a forest!

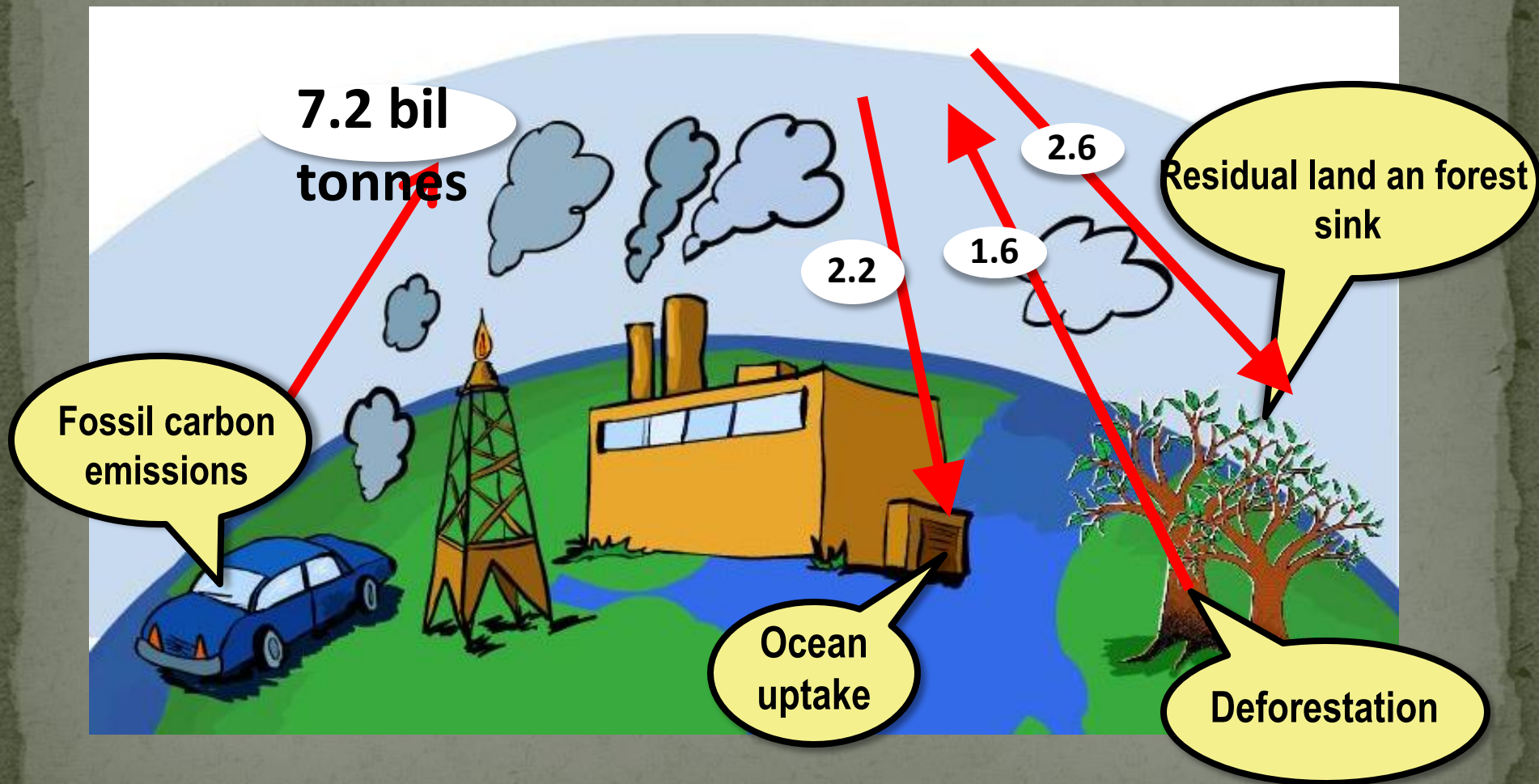
- **Padma Shri *Jadav Payeng*** is a Mishing tribe environmental activist and forestry worker from Jorhat, India.
- He has single-handedly grown a sprawling forest on a 550-hectare sandbar in the middle of the Brahmaputra. It now has many endangered animals, including at least five tigers, one of which bore two cubs recently.

Presenting a strong case that forest
holds carbon, green house gases



Global scale: The carbon cycle

Atmospheric increase 4.1 Billion tonnes of CO₂ per year



Every year, more than 15 million hectares of tropical forest — an area larger than the state of New York — are cut down, releasing millions of tons of carbon emissions and GHGs into the atmosphere further accelerating Climate change.

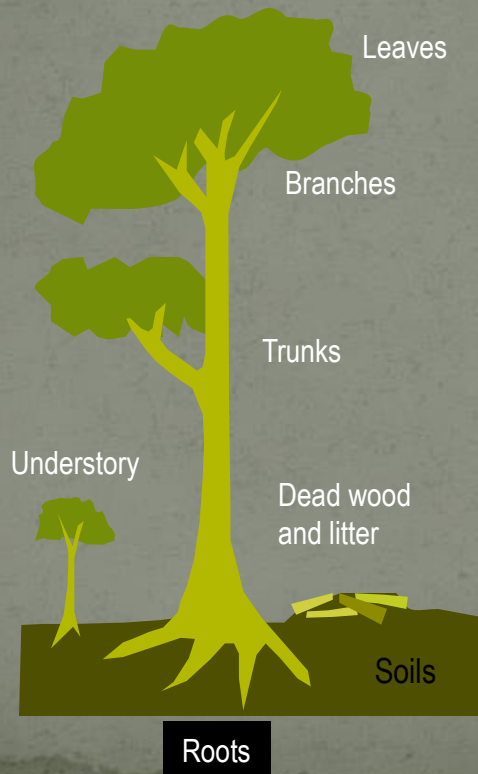
Forest scale: Stocks and fluxes

A forest = carbon stocks

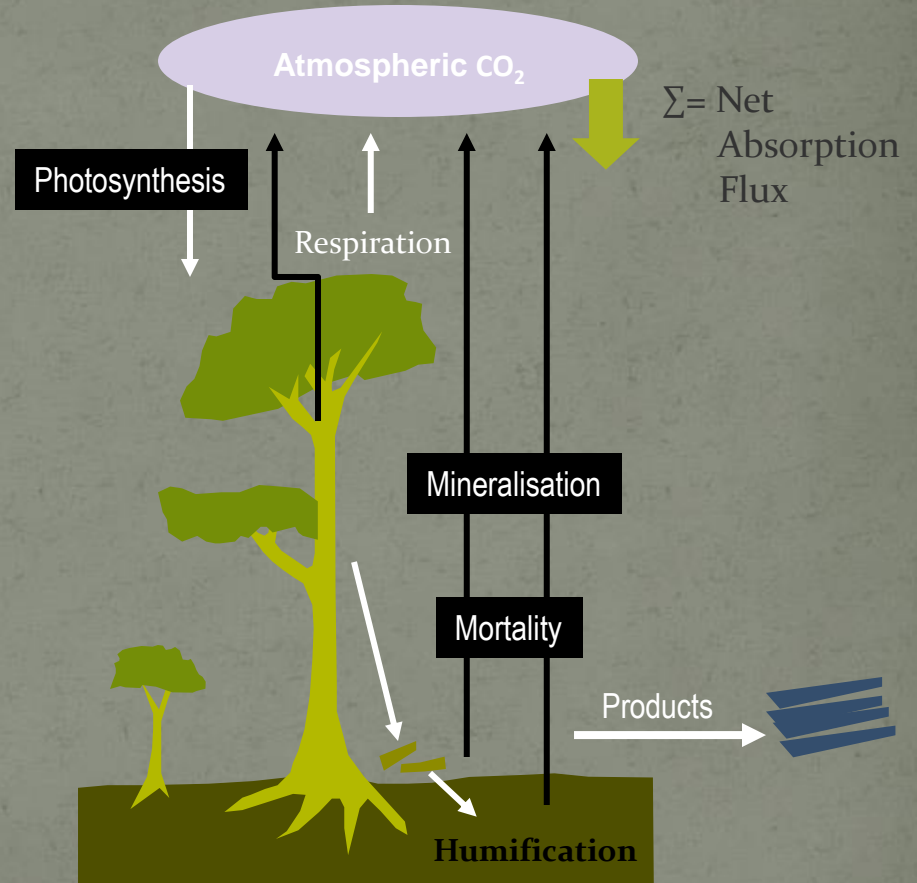
1 kilogram of dry wood \approx 0.5 kg of carbon

Tropical wet forest (IPCC, 2003):

- Aboveground biomass: 65 to 430 tC/ha
- Soils: 44 to 130 tC/ha



A forest = carbon fluxes



Forest products

- Forest products can substitute for:
 - Materials, such as steel and aluminium, whose production emits a lot of greenhouse gases
 - Energy, such as oil, coal and gas



Why Payment for Ecosystem Service (PES) needs to be recognized ?

Rajthilak S

What are Ecosystem Services ?

❖ Provisioning

❖ Regulating

❖ Supporting

❖ Cultural

Dimensions of Ecosystem Services

- Environment
- Social
- Economic

Philosophy of PES

- Demand – Supply
- Scarce Resource
- **Cost of Ecosystem Services = Availability of Ecosystem Services * f(Human population growth)**

Types of Payment

- Neutral – User Fee
- Negative – Punishment
- Positive - RPE

How much to pay?

- Quantification of Ecosystem Services- e.g. : Carbon sequestration
- Creates awareness about the value of services provided by the ecosystem
- So more conservation
- Counter argument could be → Protection should be for the sake of forest. Quantification reduces or underestimates.

Pre-requisites for successful PES schemes

- strong political support
- good systems of governance
- efficient and flexible institutional capacities

Successful examples of PES

- 1. Conservation Reserve Program (US)**- The farmers agree to plant “long-term, resource-conserving covers to improve water quality, control soil erosion and enhance habitats for waterfowl and wildlife.”
- 2. Grain for Green program (China)** - It offers farmers grain in exchange for not clearing forested slopes for farming, thereby reducing erosion and saving the streams and rivers below from the associated deluge of sedimentation

Successful examples of PES

- 3. Costa Rica** has started programs under **FUNDECOR** (an NGO) and the Ministry of Environment and Energy in order to protect natural resources. The Law 7575 took into account the value of carbon fixation, hydrological services, biodiversity protection, and provision of scenic beauty. *People were able to receive tax breaks for protecting services through the new laws.*
- 4. Brazil – Norway** paid Brazil \$1 billion Dollars for successfully conserving it's Amazon rainforests under REDD+ initiative .



Figure:- Crown Prince of Norway in Brazilian Rainforests ,as part of the \$ 1 Billion deal between the 2 nations

PES: The Indian Story



The Himalayan Fairytale

- A downstream Village – Kuhan (Kangra District)
- Paid an upstream village – Ooch – to stop grazing for 8 years on common land
- Aimed to stopping siltation of a check-dam

'Payment' for Services

- Great Himalayan National Park, Himachal Pradesh
- Communities paid Rs 5000 if no fires occur in the area they patrol
- No correlation with value of Ecosystem Services

Forest Finance

- 14th Finance Commission – Tax devolution formula – 7.5% for forest cover
- Incentivize protection

Agencies Involved

- India's report to CBD gave a tentative list of Institutions involved in PES Analysis:-
 - IIFM – Indian Institute of Forest Management
 - IGIDR – Indira Gandhi Institute for Development Research
 - IEG – Indian Economic Group
 - NBA – National Biodiversity Authority

CDM Forestry projects registered from India

SL No	Title of Project	Project location
1	Small scale cooperative afforestation CDM project for tackling shifting sand dunes	Sirsa, Haryana
2	Reforestation of severely degraded lands in AP under ITC SF project	Khammam, Andhra Pradesh
3	The international small group and tree planting program (TIST)	Kancheepuram, Tiruvannamalai, Thiruvallur districts of Tamilnadu
4	Improving rural livelihoods through C-sequestration by adopting environment friendly technology based agro-forestry practices	Orissa and Andhra Pradesh

CDM Forestry projects registered from India

SL No	Title of Project	Project location
5	India – HP reforestation project-Improving livelihoods and watersheds	Himachal Pradesh
6	Begepalli CDM reforestaion program	Karnataka
7	Reforestation of degraded land in MTPL in India	Orissa, Chhattisgarh , Andhra pradesh
8	Agro-forestry interventions in Koraput district of Orissa	Koraput, Orissa
9	Rehabilitation of degraded wastelands at Deramandi	South Delhi

Kinds of Market Available

Carbon market –

The carbon market relies on emission trading and the transfer of carbon credits. The carbon market created under the Kyoto Protocol and a number of regional and national emission trading schemes is worth billions of dollars each year.

The European Union Emissions Trading System (EU ETS) –

It was launched in 2005 to fight Global warming and is a major pillar of EU climate policy. Members - 31 countries.

The International Carbon Action Partnership (ICAP) - was founded in 2007. It was launched in order to join carbon markets all over the world and by that be more successful in combating climate change. The rationale behind ICAP's work is that linking carbon cap and trade systems would lead to economic, social and environmental benefits.

Personal carbon trading - Under this emissions credits would be allocated to adult individuals on a (broadly) equal per capita basis, within national carbon budgets.

Regional Greenhouse Gas Initiative (RGGI, or ReGGIe) -

It is a regional initiative by states and provinces in the Northeastern United States and Eastern Canada regions to reduce greenhouse gas emissions. RGGI is a cap-and-trade system for CO2 emissions from power plants in the member states.

European Energy Exchange -

It is Germany's energy exchange, is the leading energy exchange in Central Europe. Here power, natural gas, CO2 emission allowances, coal and guarantees of origin are traded.

The European Climate Exchange (ECX) -

ECX Futures is the most liquid, pan-European platform for carbon emissions trading, with its futures contract based on the underlying EU Allowances (EUAs) and Certified Emissions Allowances (CERs) attracting over 80% of the exchange-traded volume in the European market.

Indian Markets-

Multi Commodity Exchange of India Ltd (MCX) –

MCX offers futures trading in 56 commodities including bullion, energy, grains, plastics, metals, oil and oilseeds, fibres, spices, pulses, sugar, plantations and **carbon credits** as on March 31, 2008

National Commodity and Derivatives Exchange Limited (NCDEX)-

PES & REDD +

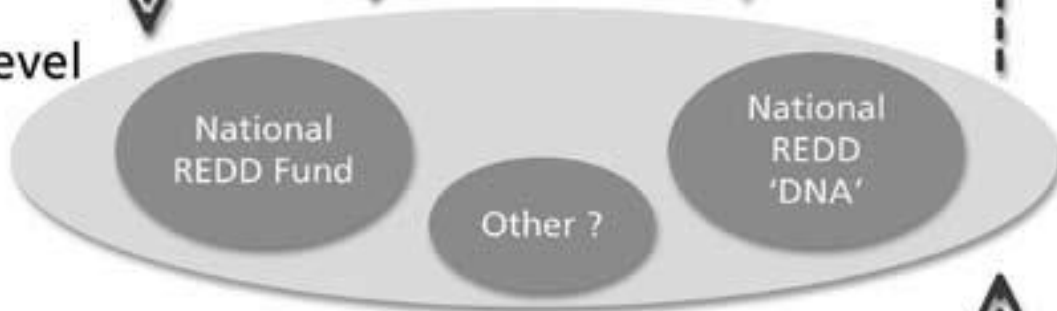
- PES initiatives motivates communities to conserve catchment and protected areas and therefore addressing REDD + objective
- PES has direct link with climate change mitigation/adaptation and thus embracing CDM and REDD +
- PES implementation means adhering the Kyoto protocol which advocate reduction of carbon emission

International level



International REDD-PES scheme

National level



National REDD-PES scheme

Sub-national level



CONTINUING CHALLENGES

- Many PES initiatives are currently unsustainable without regular and strong external support
- The average revenues obtained from PES are still too low
- limited recognition of the values of forest ecosystem services in public policy and financial decision making
- complexity of rules ,absence of widely accepted standards, unclear tenure and property rights and uncertainty over long-term sustainability

Thank you
