

# Travel Clean – Travel Green



**Amrita Chatterjee**  
**South Asian Forum for Environment [SAFE]**

# Institutional Background

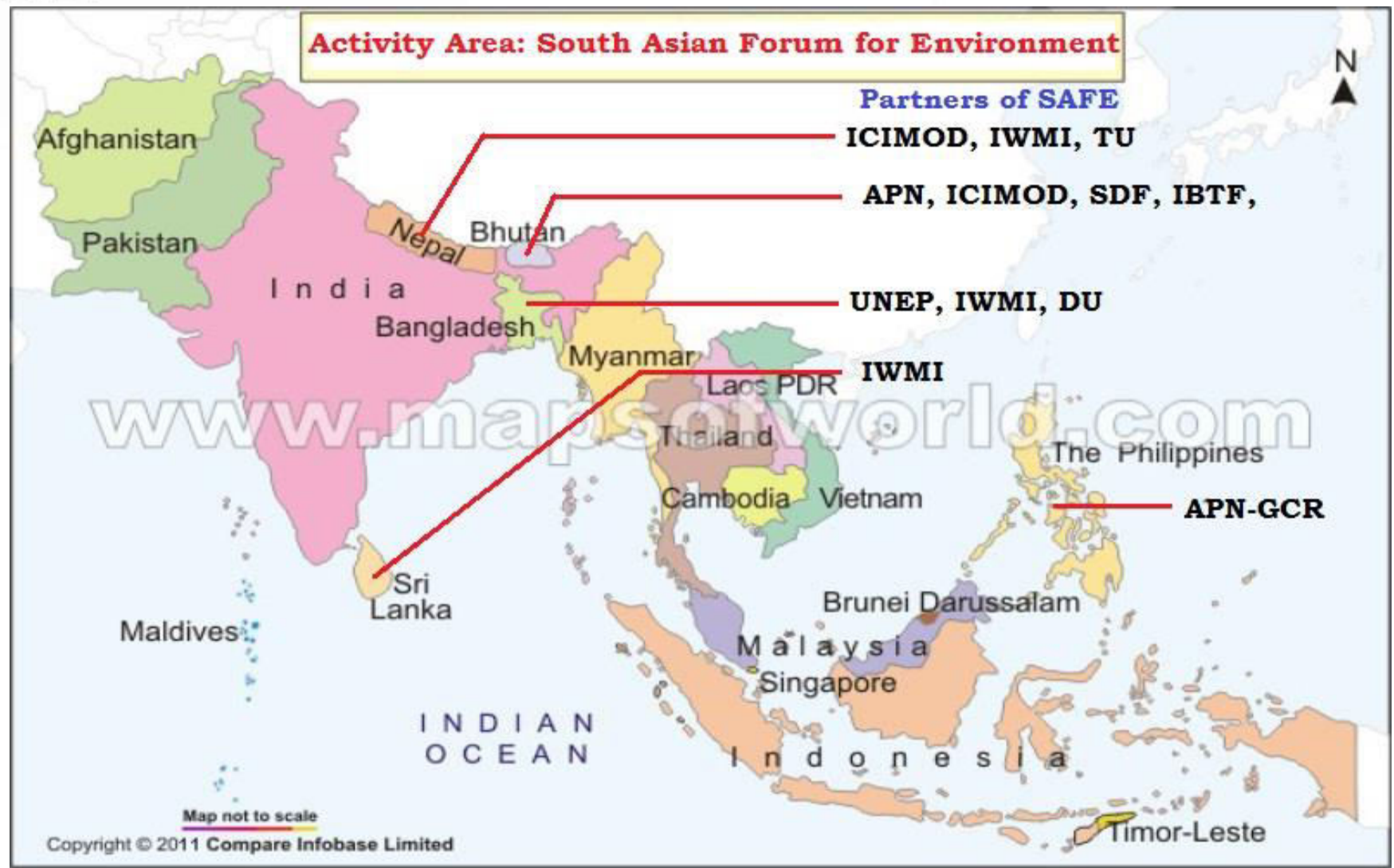
- South Asian Forum for Environment [SAFE] works at science society interface towards sustainable development goals in the Indian Ecoregion.
- SAFE envisages global partnership and local participation to ensure equity and reciprocity for the bio-rights of commons





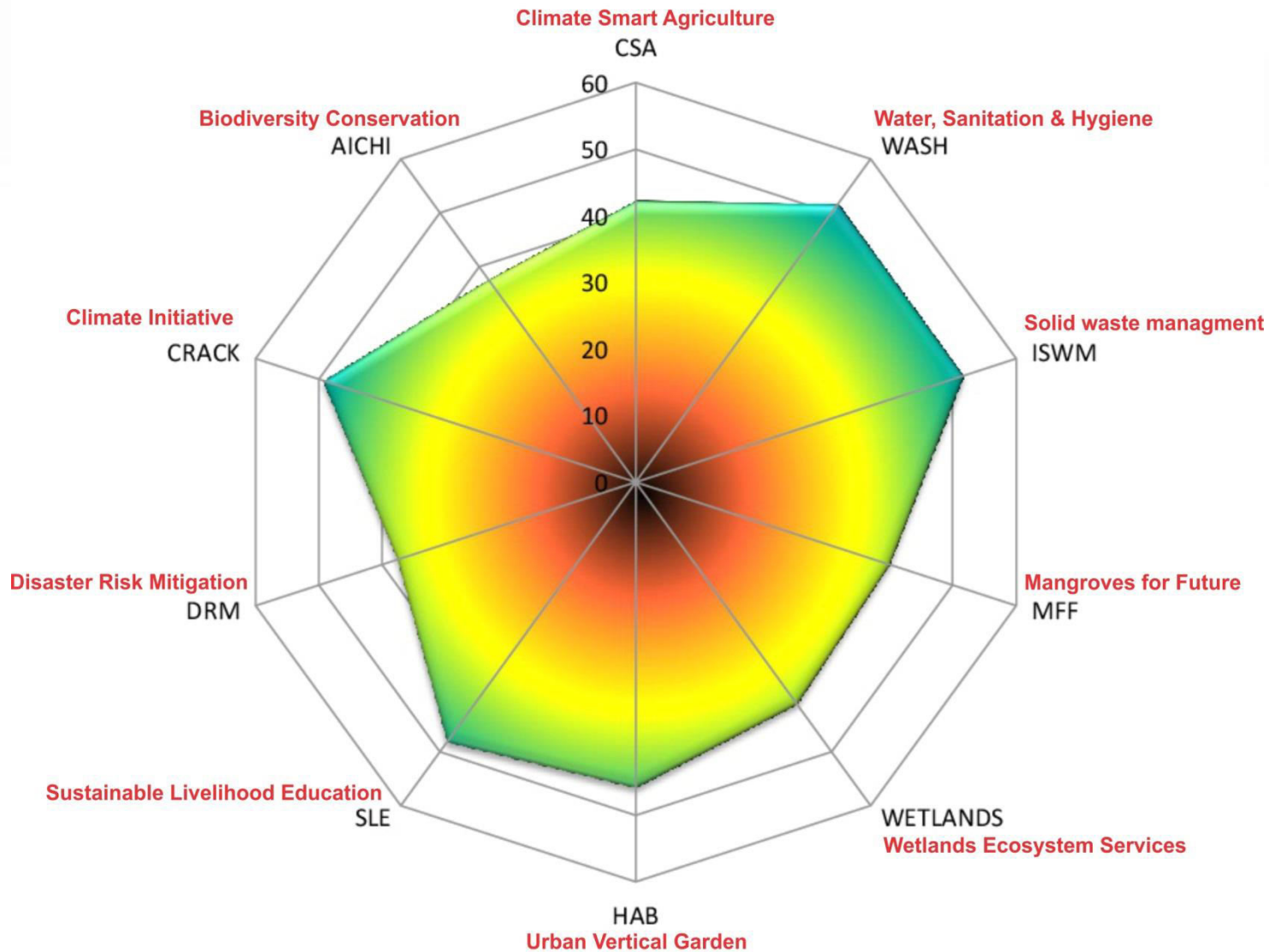
# SAFE

# Institutional Background Contd.



SAFE Interventions & Sustainable Development Goals (Agenda 2030)											
SAFE INTERVENTIONS	→	CSA	WASH	DRRM	WFP	WATLANDS	RRR	CC	DRM	CRACK	ADRR
1. SUSTAINABLE DEVELOPMENT GOALS	↓										
2. NO POVERTY		Green	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
3. ZERO HUNGER		Green	Yellow	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
4. GOOD HEALTH & WELL-BEING		Green	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
5. QUALITY EDUCATION		Yellow	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
6. GENDER EQUALITY		Green	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
7. CLEAN WATER & SANITATION		Yellow	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
8. AFFORDABLE & CLEAN ENERGY		Yellow	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
9. DECENT WORK & ECONOMIC GROWTH		Green	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
10. INDUSTRY, INNOVATION AND INFRASTRUCTURE		Yellow	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
11. REDUCED INEQUALITIES		Yellow	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
12. SUSTAINABLE CONSUMPTION AND PRODUCTION		Yellow	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
13. CLIMATE ACTION		Green	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
14. LIFE BELOW WATER		Yellow	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
15. LIFE ON LAND		Green	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
16. PEACE AND JUSTICE STRONG INSTITUTIONS		Yellow	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow
17. PARTNERSHIPS FOR THE GOALS		Green	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow

# SAFE Interventions & Sustainable Development Goals (Agenda 2030)



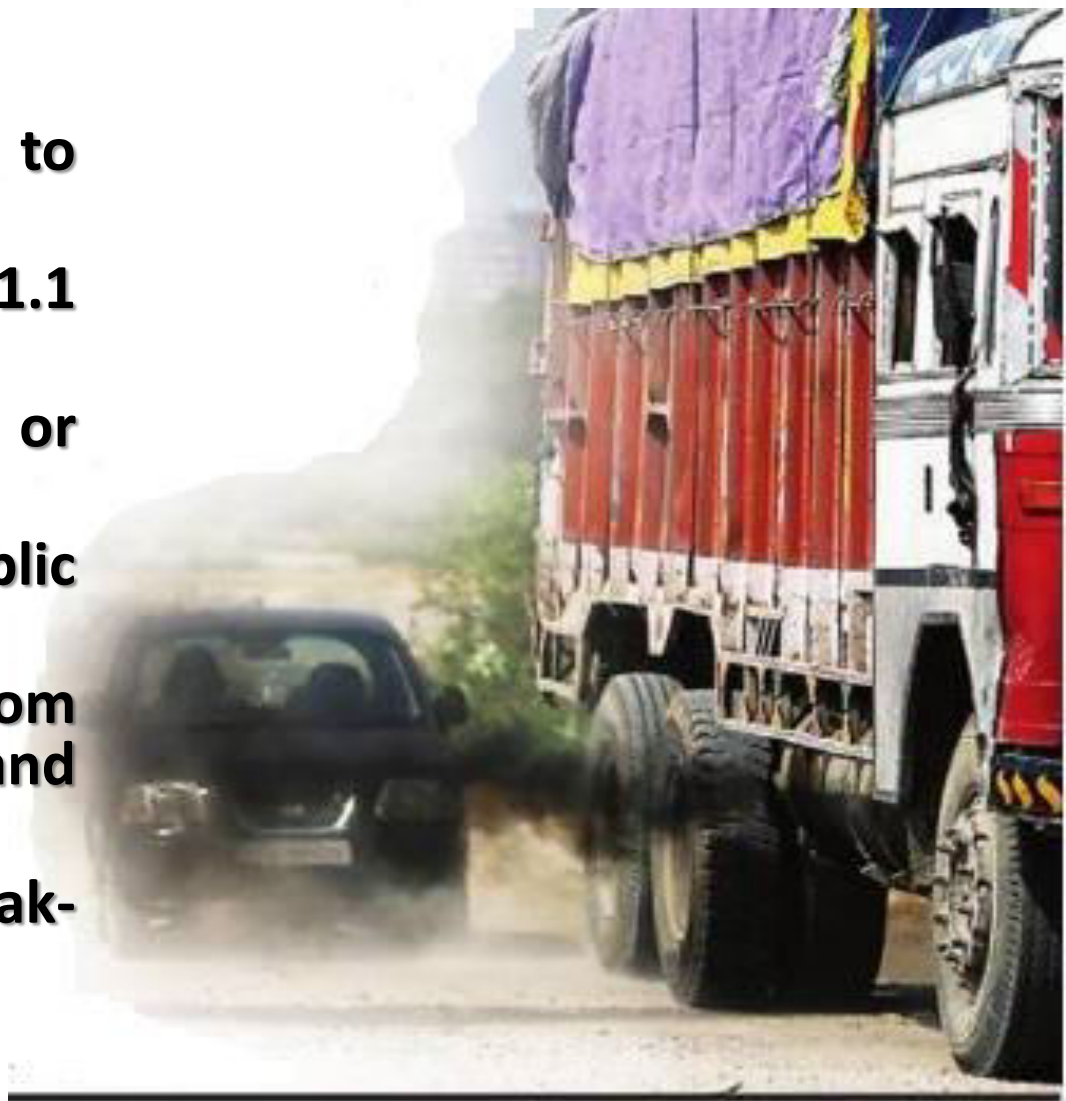


# Sustainable Transport... Our Issues & Concerns



# Pollution Footprints

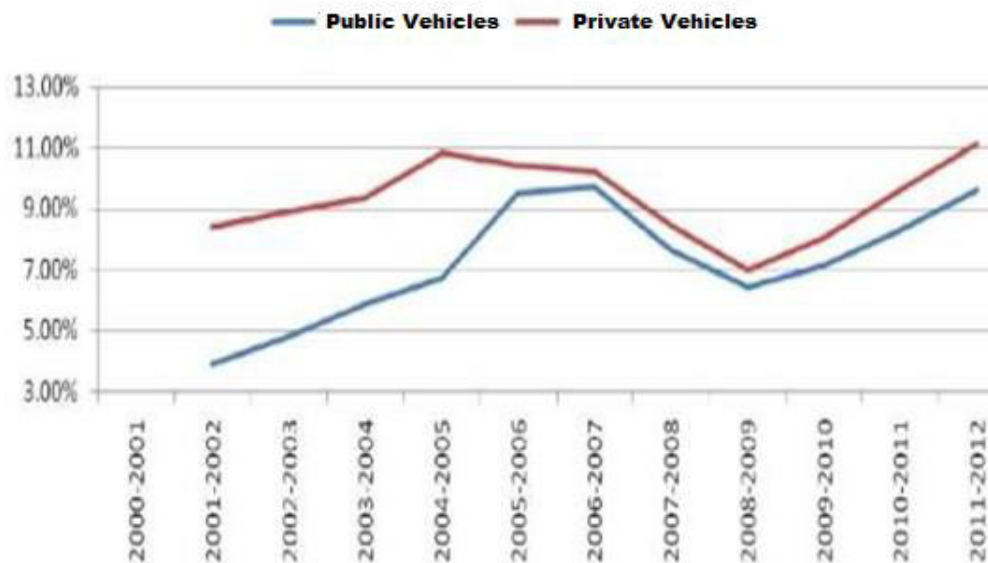
- 57% of air pollution is due to motor vehicles
- Emission of GHGs and SPM (1.1 micron)
- 73.2% vehicles run on diesel or kerosene-mix-oils
- Average age of vehicles in public transport is 14 years
- Every 4<sup>th</sup> person suffers from respiratory tract diseases and asthma
- Increase in road-noise (peak-hours) is 16.6%



# Non-sustainable usage: Many – One Dilemma

- Increasing private automobiles for point-to-point movement is decreasing urban carrying capacity
- Swelling load on rural vehicles for limited public transport options is deteriorating air quality in rural.

Variation in annual rates of vehicles registration in Kolkata

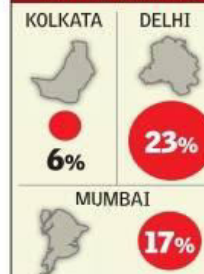




- Per capita travel space shrinking in unsustainable public transport. Travel comfort Safety is compromised.
- Road space per unit automobiles is increasing. Habitat health and commuters time is compromised.

## EVERY INCH TAKEN

### ROAD SPACE IN METRO CITIES



Road	Avg Speed	Road length	Cars in morn peak	Cars in evng peak	Total hours lost	Value of lost time (Rs)
SC Mallick Road	16	4	2678	2487	878.05	16682.95
MG Road	9	3	1507	1599	848.97	16130.49
AJC Bose Road	18	6	1915	1851	803.41	15264.85
CR Avenue	25	4	2028	2112	331.2	6292.80
Deshpran Sasmal Rd	15	2	1693	1848	330.49	6279.37
JL Nehru Road	25	3	2237	2246	268.98	5110.62
RG Kar Road	18	2	1397	1415	199.96	3799.32
Lenin Sarani	20	2	1042	1225	136.02	2584.38
Jatindra Mohan Ave	20	1	1390	1407	83.91	1594.29
Vivekananda Road	40	1.2	1202	1768	17.82	338.58
<b>Total</b>			<b>17089</b>	<b>17958</b>	<b>3898.82</b>	<b>74077.66</b>

\* Study by Centre for Urban Economic Studies, Calcutta University

### Rise in ownership pattern

Car	Bike
 1998 <b>1.73%</b>	 1998 <b>5.67%</b>
2008 <b>11%</b>	2008 <b>16.5%</b>

Bikes occupy most road space but carry only 12% of commuters

▶ The test was carried out from 9 -10am and 6-7pm

▶ This means that ₹74,077 is lost in just two hours on 10 Kolkata roads

▶ Annual loss on these 10 roads is a whopping ₹2.67 crore

▶ The cost of social and environmental impact needs to be calculated



### How we lose out

People caught in traffic jams lose productive time

Vehicles idling in slow traffic burn more fuel

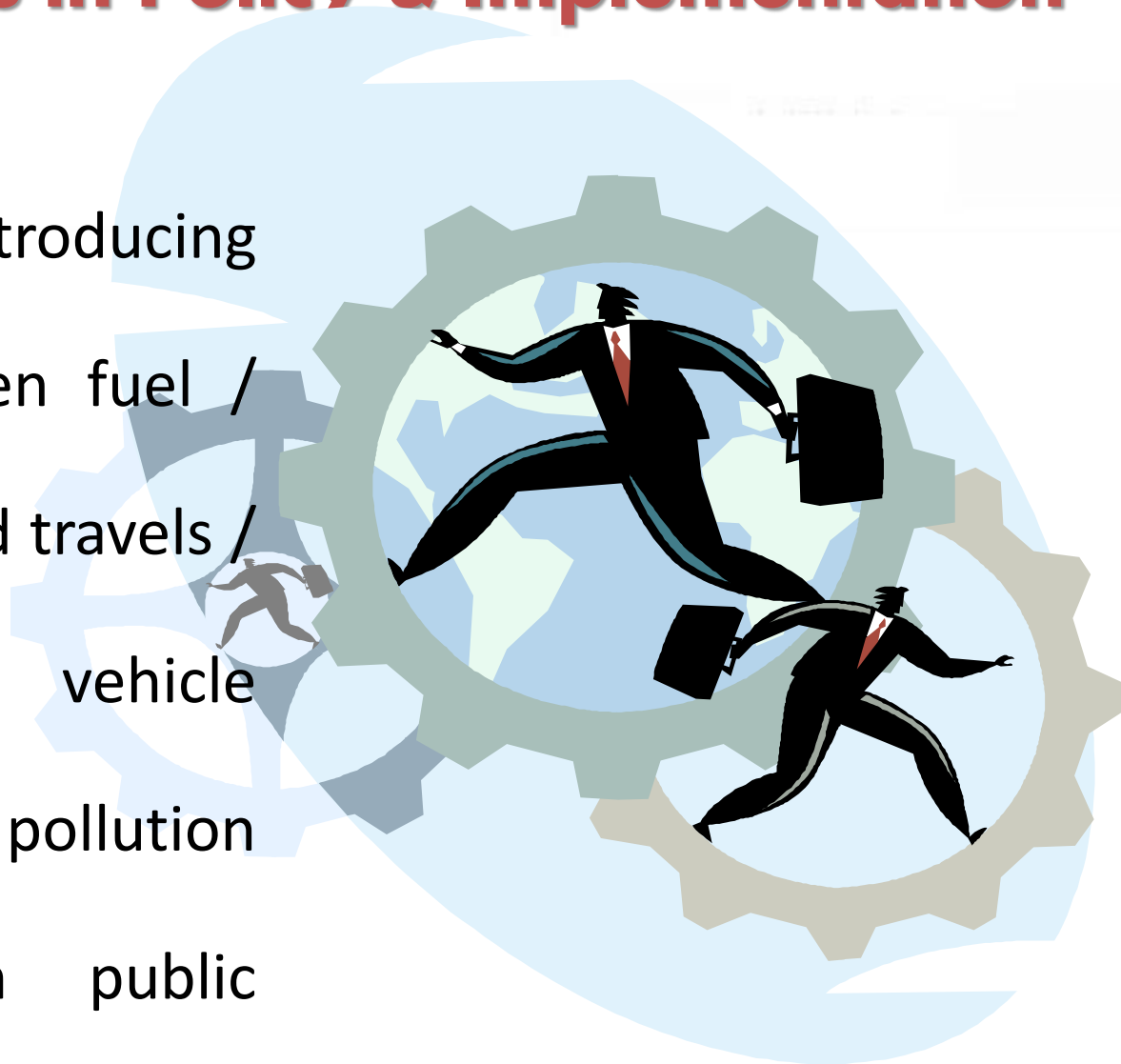
Vehicles create double the pollution than they would in free flowing traffic

This leads to health impacts as Kolkata commuters breathe in more pollution than any other Indian metro



# Gaps in Policy & Implementation

- No policy for introducing electrical vehicles
- No incentives for green fuel / renewable energy
- No mandates for shared travels / pool cars
- No limits in public vehicle registration system
- No efficient vehicular pollution monitoring system
- No improvement in public transportation system



# Our Concerns in Sustainable Transport Issue...

- Equitable access to all
- Affordable for all
- Safety for all goers
- Habitat is safe
- New-energy prodigy

# Our Achievements in Sustainable Transport



- Ban on polluting urban Autos – bringing in CNG and Battery-run vehicles in Kolkata
- Rehabilitating the electrical Tram car in Kolkata
- ‘Chakra Satyagraha’ – a mass campaign against blanket ban on cycles in Kolkata



**THE HINDU**

Home Today's Paper All Sections News National International Opinion Business Sport Videos  
Andhra Pradesh Karnataka Kerala Tamil Nadu Telangana Other States

NATIONAL > OTHER STATES KOLKATA, August 28, 2009  
Updated: August 28, 2009 20:59 IST

## Kolkata to have only 4-stroke LPG auto-rickshaws

Home Loan EMI Calculator - How much EMI will you have to pay? Just enter amount, tenure & rate  
apnapaisa.com/EmiCalculator

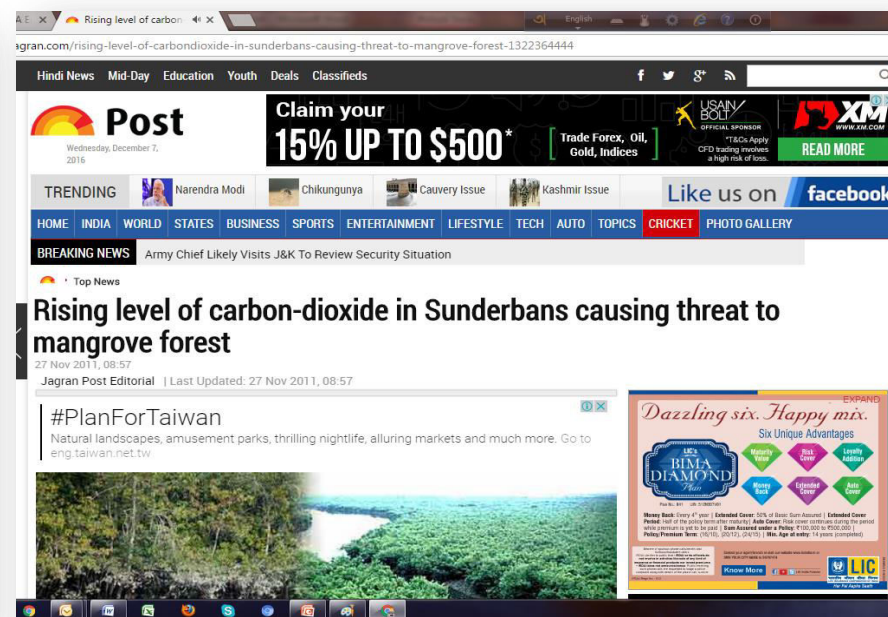
STAFF REPORTER

Like 0 Share Tweet G+1 0 in Share Pin it Share

**Calcutta High Court bans conversion of 2-stroke auto-rickshaws to 4-stroke**

A Division Bench of the Calcutta High Court has ordered that only four-stroke auto-rickshaws running on liquid petroleum gas (LPG) will be allowed to ply on Kolkata's roads.

It also observed that the West Bengal Government's notice permitting two-stroke auto-rickshaws that have been running since August 1, 2009, to be converted to four-stroke with LPG kits and run on



igran.com/rising-level-of-carbondioxide-in-sunderbans-causing-threat-to-mangrove-forest-1322364444

Hindi News Mid-Day Education Youth Deals Classifieds

**Post**  
Wednesday, December 7, 2011

Claim your **15% UP TO \$500\*** Trade Forex, Oil, Gold, Indices

TRENDING Narendra Modi Chikungunya Cauvery Issue Kashmir Issue Like us on facebook

HOME INDIA WORLD STATES BUSINESS SPORTS ENTERTAINMENT LIFESTYLE TECH AUTO TOPICS CRICKET PHOTO GALLERY

BREAKING NEWS Army Chief Likely Visits J&K To Review Security Situation

Top News

## Rising level of carbon-dioxide in Sunderbans causing threat to mangrove forest

27 Nov 2011, 08:57  
Jagran Post Editorial | Last Updated: 27 Nov 2011, 08:57

#PlanForTaiwan  
Natural landscapes, amusement parks, thrilling nightlife, alluring markets and much more. Go to eng taiwan.net.tw

Dazzling six. Happy mix. EXPAND

Six Unique Advantages

ULI'S BIMA DIAMOND

Healthy Life, Risk Free, Liquidation, Money Back, Life Cover, Auto Cover

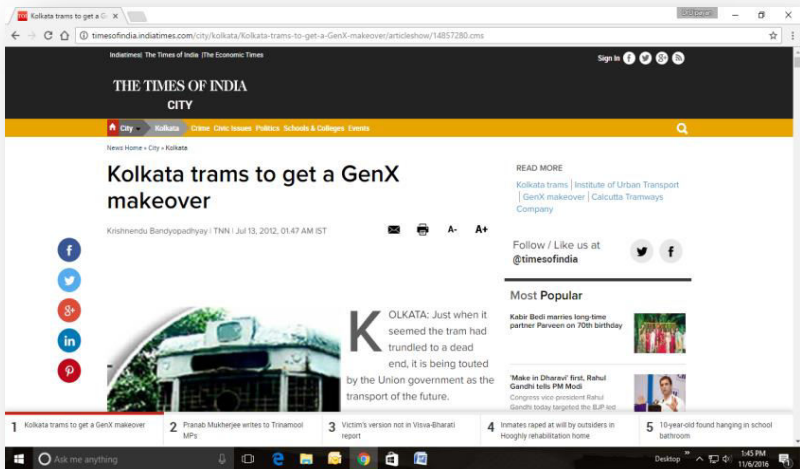
Shree Bank, Every 4th year | Estimated Cover: 50% of Basic Sum Assured | Estimated Cover: 100% of the policy sum assured | Auto Cover: 100% cover continues during the period when you are in need to be paid | Sum Assured under a Policy: ₹100,000 to ₹50,00,000 | Policy Premium: ₹10,000 to ₹20,00,000 | Min. Sum of money: 10 years continuous.

Know More LIC

# Planning Green Rides with 'TOTO'



# A Heritage Travel with Tram



# Chakra Satyagraha Non-violence on wheels

## Why this CycleBan?

Takes 5 Times Less Space : De-Congest

Car



Cycle & NMT



Public Trans



Hoarding at Garia, Kol

Safe & Smart  
Kolkata

Health | Air  
Money | Joy





- First Strategic EIA on transport system in Kolkata published in Green Interpreters (ISSN
- First Emission foot printing of engine-boats in Sundarbans (Reported in TOI dated
- First C40 Smart City Conference with US Consulate in Kolkata on Sustainable Transport
- School awareness campaigns on 'NO HONKING, NO POLLUTION'
- Side Event in COP21 Paris – on Electrical Cities and Sustainable Transportation

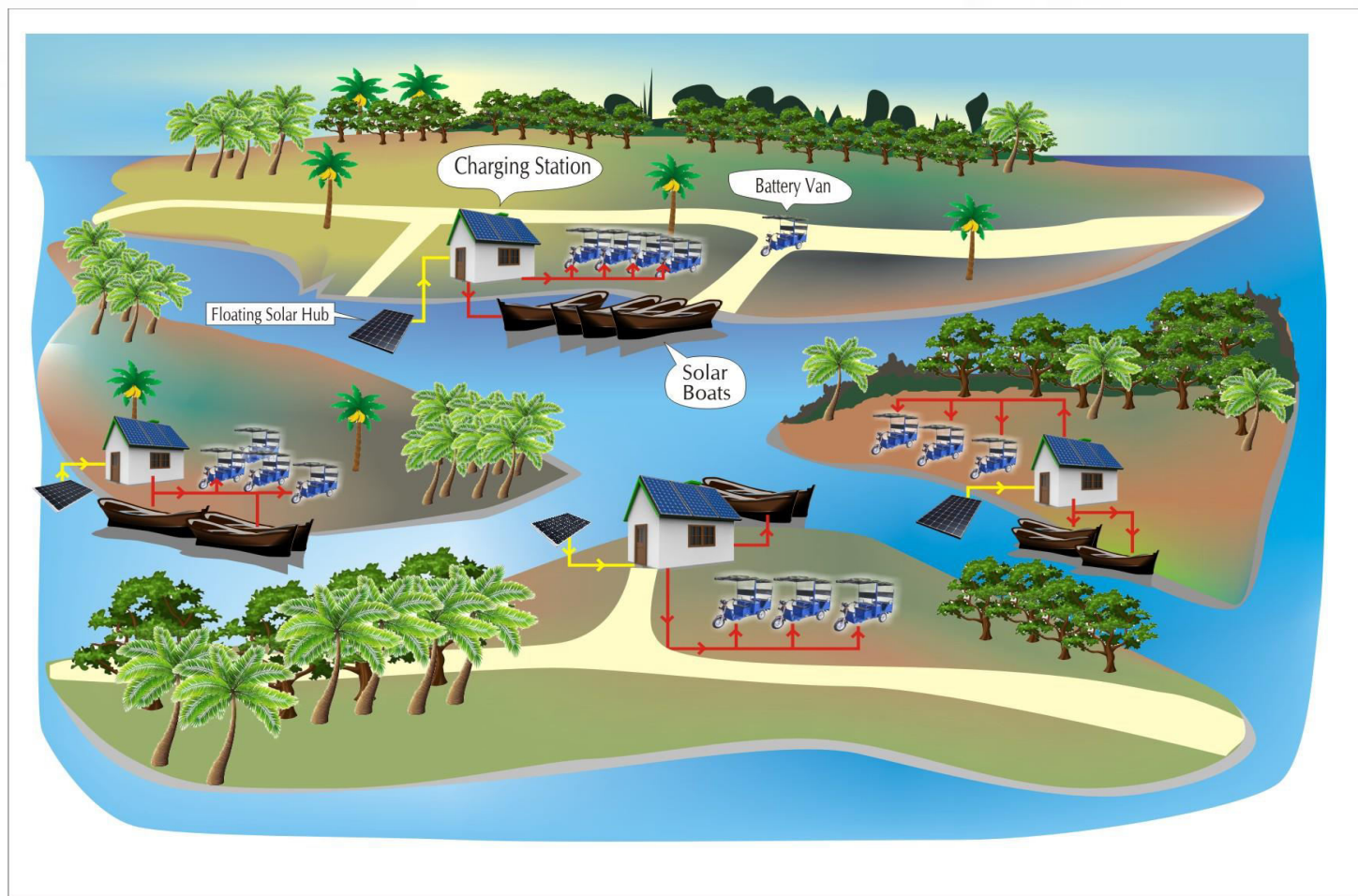


**SAFE**

# Street Campaigns with School Students



## Aqua-Solar Systems for Integrated & Sustainable Transport





# SAFE

# ASSIST

## MAIN FLOAT SUPPORTING THE PV MODULE

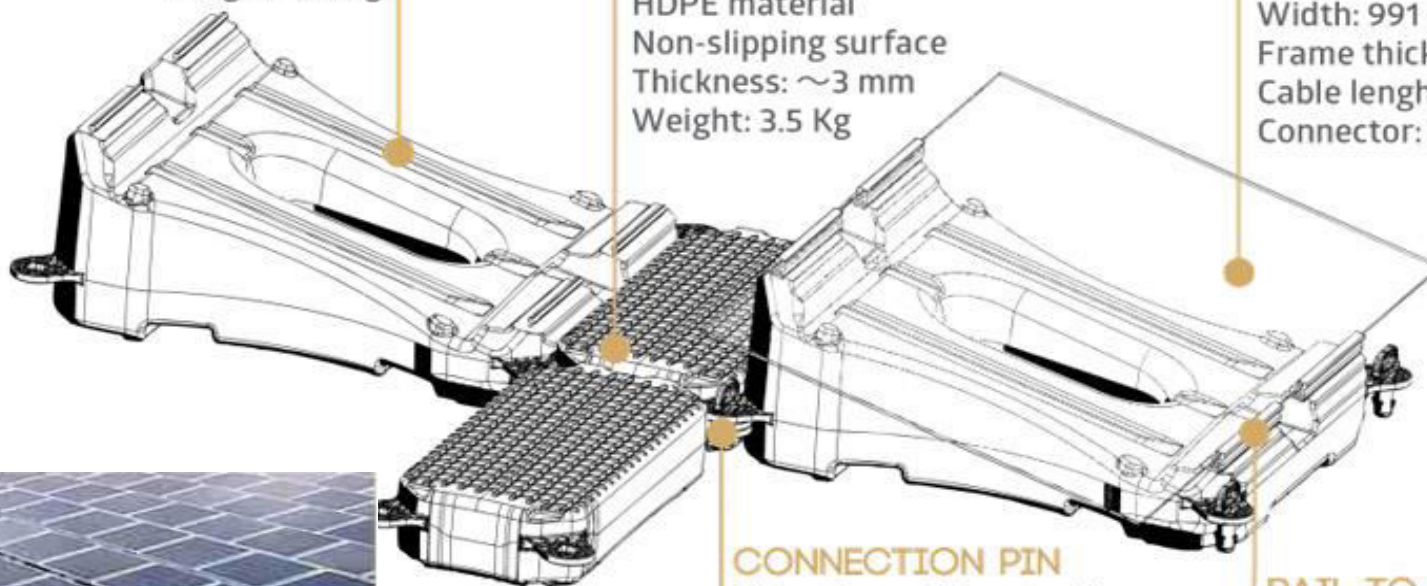
HDPE material  
Inclination Angle: 12°  
Thickness: ~3 mm  
Weight: 9,5 Kg

## SECONDARY FLOAT FOR MAINTENANCE/BUOYANCY

HDPE material  
Non-slipping surface  
Thickness: ~3 mm  
Weight: 3.5 Kg

## STANDARD FRAMED 60 CELLS PV MODULE

Length: max 1670 mm  
Width: 991 mm ± 3  
Frame thickness: 25~40 mm  
Cable length: 900~1200 mm  
Connector: MC4 compatibility



## CONNECTION PIN

Fiberglass + PP material  
Certification NFT 58 000

## RAIL TO FIX THE PV MODULE ON THE FLOATS

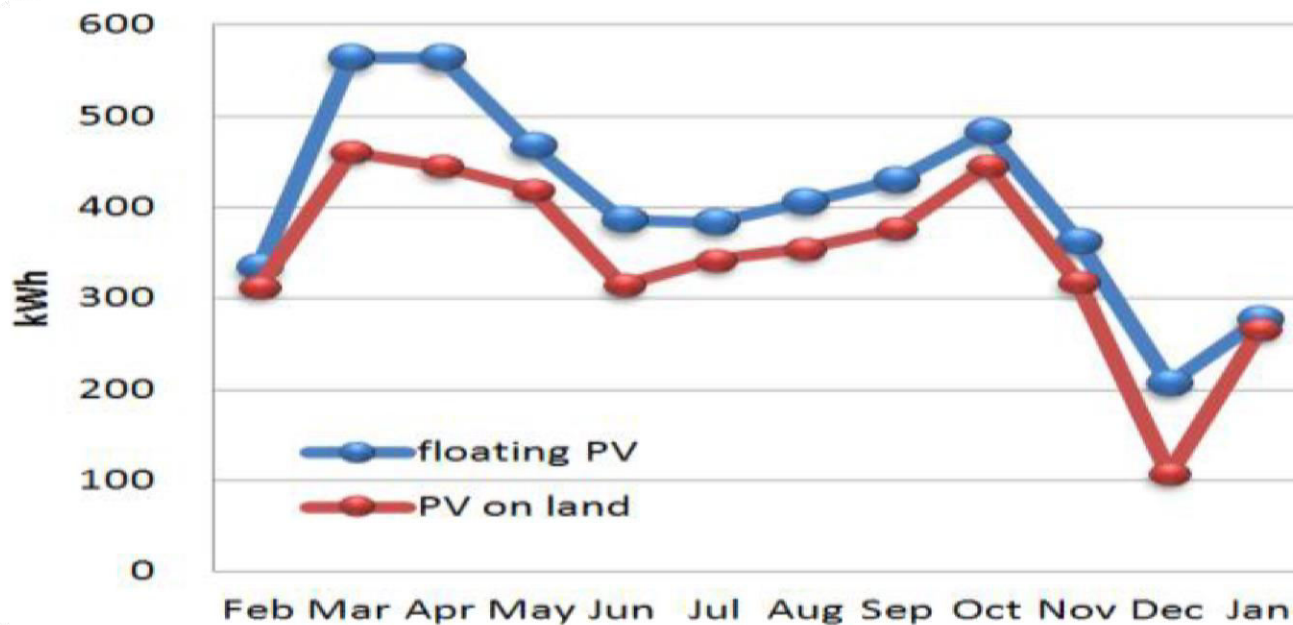
Aluminium or EPDM rail  
Certificated ISO 3302-1/1996



## Comparison Floating PV & Overland PV

- Floating solar panels( Blue) having 10.3 % more efficient than overland system.

**Fig.: Comparison Graph**



# Challenges in Implementation



1. Strengthening Technology for sustainable growth in rural areas
2. Resource convergence for financing innovations in Sust. Transport
3. Incentivizing new energy usage for rural public transport system
4. Awareness on benefits over cost implications in using solar vehicles



**SAFE**

# Future program for scale and impact: **5Es** of Sustainable Transport

Emission  
Reduction

Economic  
Sustainability

Ensuring  
Safety

Empowerment

Energy  
Prodigy



**5E**



## Awareness Campaign for Attitude Change

- Educating transport sector stakeholders, owners and dealers
- Action research at science-society interface for commuters



## Save Sundarban Habitat with ASSIST

- Technology cooperation for more economic new-energy prodigy
- Elimination of emitting vehicles to save the habitat from pollution
- Awareness drive for safe and smart travel



## Sustainable Transport in Climate Smart Cities in India

- Promote clean fuel and green energy in city transport system
- Use science communication for traffic management and road safety
- Advocacy for sustainable transportation, shared travel, car pool



Travel green to travel far  
with this planet...

Thanks