



WWF experiences with REDD in Nepal challenges and opportunities

Maija Kaukonen

**Forest expert, international
development program**

WWF Finland

18.11.2011

WWF APPROACH TO FOREST CARBON INVENTORY

Step 1
Defining Project
Boundary

Step 2
Selection of
carbon pools

Step 3
Stratification

Step 4
Developing
sampling Design

Step 5
Plot layout

Step 6
Measurement

Step 7
Data analysis for
biomass and soil
carbon estimation

Step 8
Projecting Land Use
Changes

Step 9
Reporting C-stocks for
different pools under
baseline and project
scenario



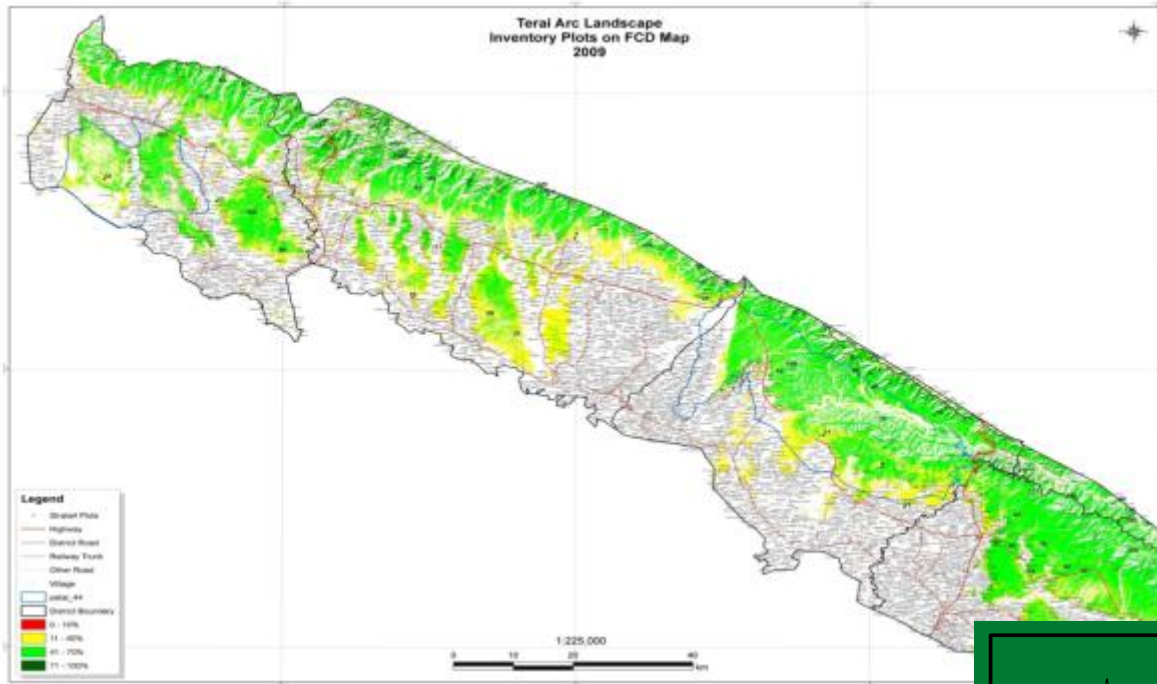
CAPACITATING LOCAL LEVEL - TRAINING LOCAL RESOURCE PERSONS FOR THEORY AND FIELD WORK

- 4 events of 5 days long training on field data collection
- 120 LRPs (Including DFO staff) developed in 14 Districts in TAL
- 30 enumerators trained on socio-economic survey
- 23 Trainers developed on Carbon Inventory
- 30 Trainer developed on Forest Carbon and Climate Change

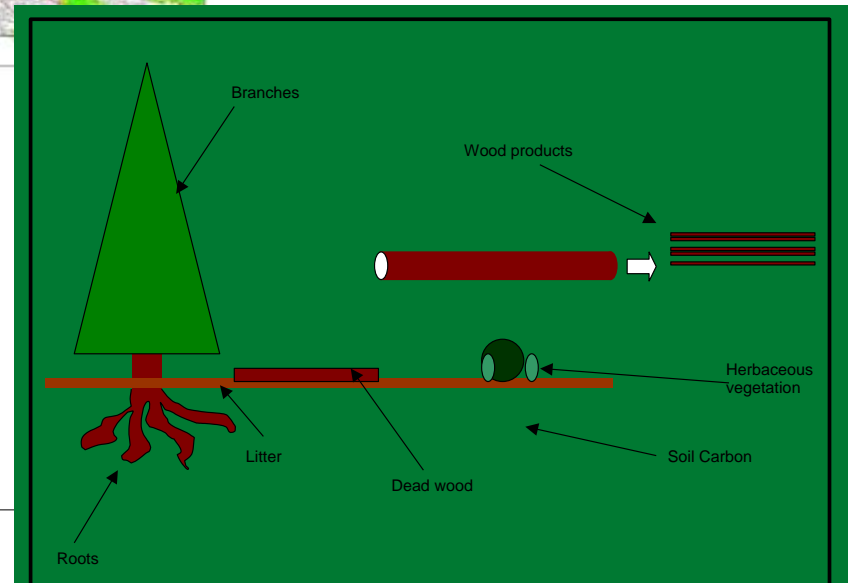




STRATIFICATION AND SELECTED CARBON POOLS

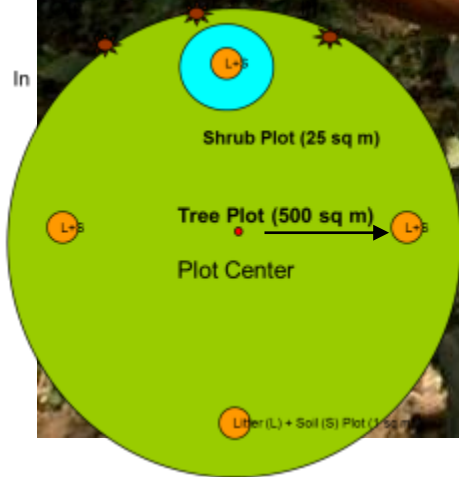


SN	Forest Crown Density	Strata
1	1 – 10%	Shrub Land (Non Forest)
2	11 – 40%	Degraded Forest
3	41 – 70%	Moderately Dense Forest
4	71 – 100%	Dense Forest



STEPS IN FIELD INVENTORY

1. Locating Plot Center with GPS and plot area demarcation
2. Trees included in the plot (vertex)
3. Tree Height, Diameter and Canopy Density
4. Litter and shrub collection for Lab Analysis (500g)
5. Soil Collection for Lab Analysis (500g)
6. Biodiversity and degradation monitoring





WWF REDD –PROJECT IN TERAJ ARC LANDSCAPE OUTCOMES:





Projecting deforestation

Stratum-wise Time-series Forest Area (in ha) (Landsat)

Strata	1990	1999	2000	2001	2002	2009
Stratum 1	9,719	11,737	13,491	18,001	12,558	8,696
Stratum 2	161,814	214,155	335,249	282,191	229,664	222,510
Stratum 3	848,769	781,081	677,225	739,822	758,925	762,592
Stratum 4	131,409	131,725	164,644	109,214	124,299	117,197
Total	1,151,711	1,138,698	1,190,609	1,149,228	1,125,446	1,110,996

Annual Deforestation Rates in % (1990-2009)

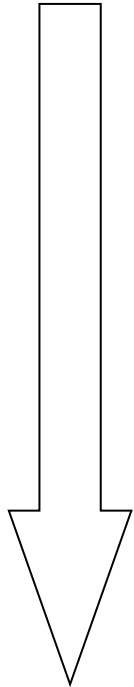
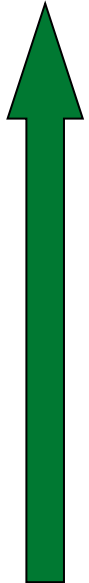
With Stratum 1	0.19
Without Stratum 1	0.18



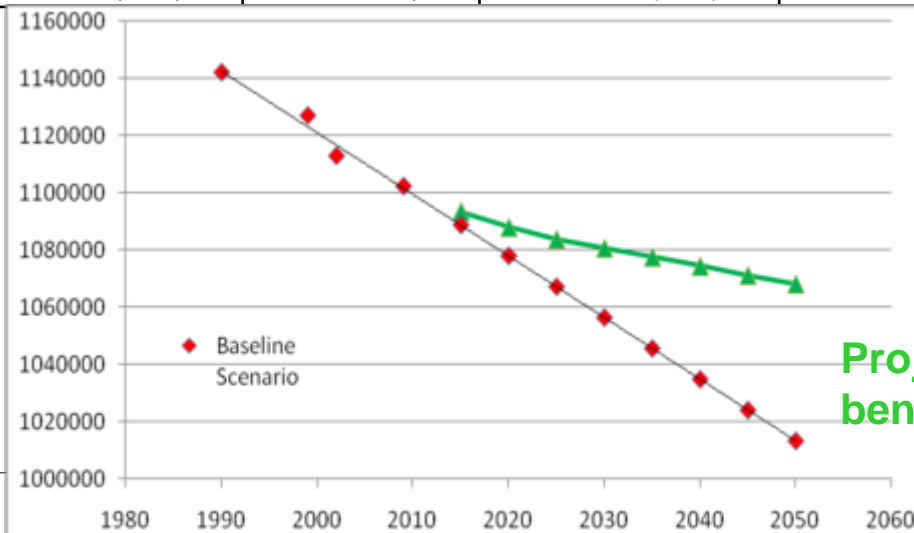
Projecting deforestation

Year	Remaining Forest Area (ha)	Deforestation (ha)	Project Scenario	
			Remaining Forest Area (ha)	Avoided Deforestation (ha)
1990	1,141,992			
1999	1,126,961			
2002	1,112,888			
2009	1,102,300			
2015	1,088,745	13,555	1,093,578	4,833
2020	1,077,981	10,764	1,088,088	10,107
2025	1,067,217	10,764	1,083,930	16,713
2030	1,056,454	10,764	1,080,777	24,323
2035	1,045,690	10,764	1,077,632	31,942
2040	1,034,927	10,764	1,074,497	39,570
2045	1,024,163	10,764	1,071,371	47,208
2050	1,013,400	10,764	1,068,254	54,854

0.06%



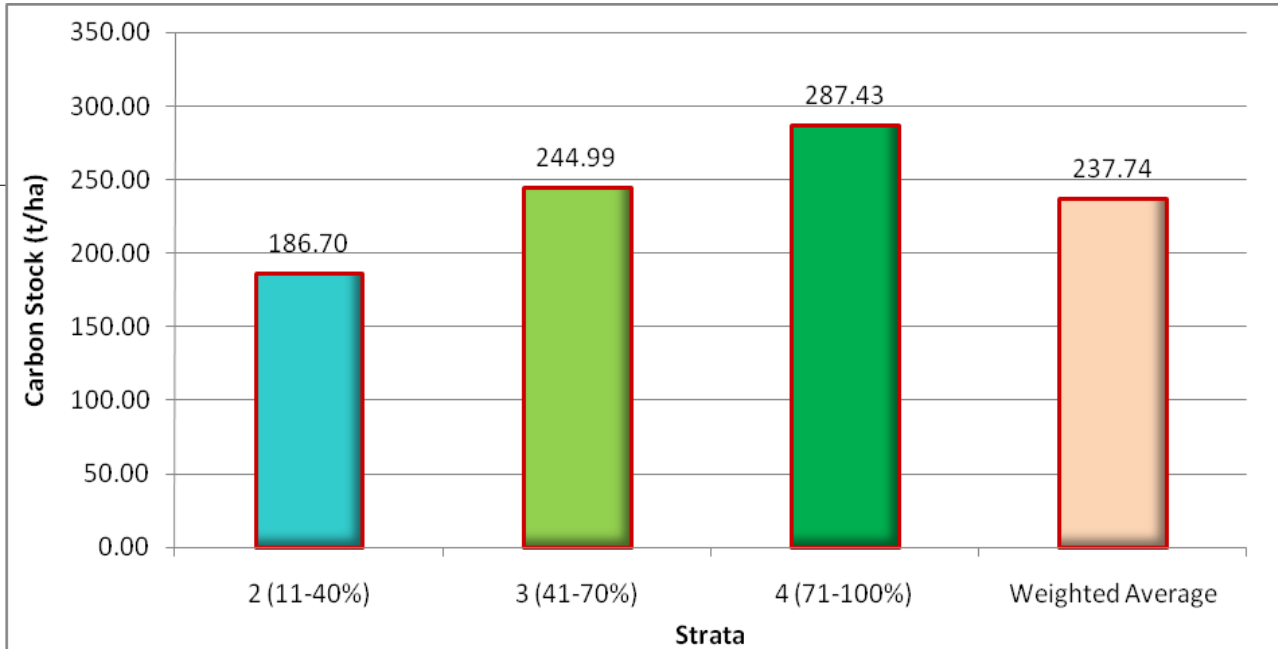
0.19%



Project benefit



Outcomes: Average carbon stock (area 1,1 M ha)



Strata	2 (11-40%)	3 (41-70%)	4 (71-100%)	Weighted Average
Mean Carbon Stock (tC/ha)	186.70	244.99	287.43	237.74
Uncertainty at 95% CI	±42.14	±25.41	±47.88	±66.45
Lower Boundary at 95% CI	144.56	219.58	239.54	171.29



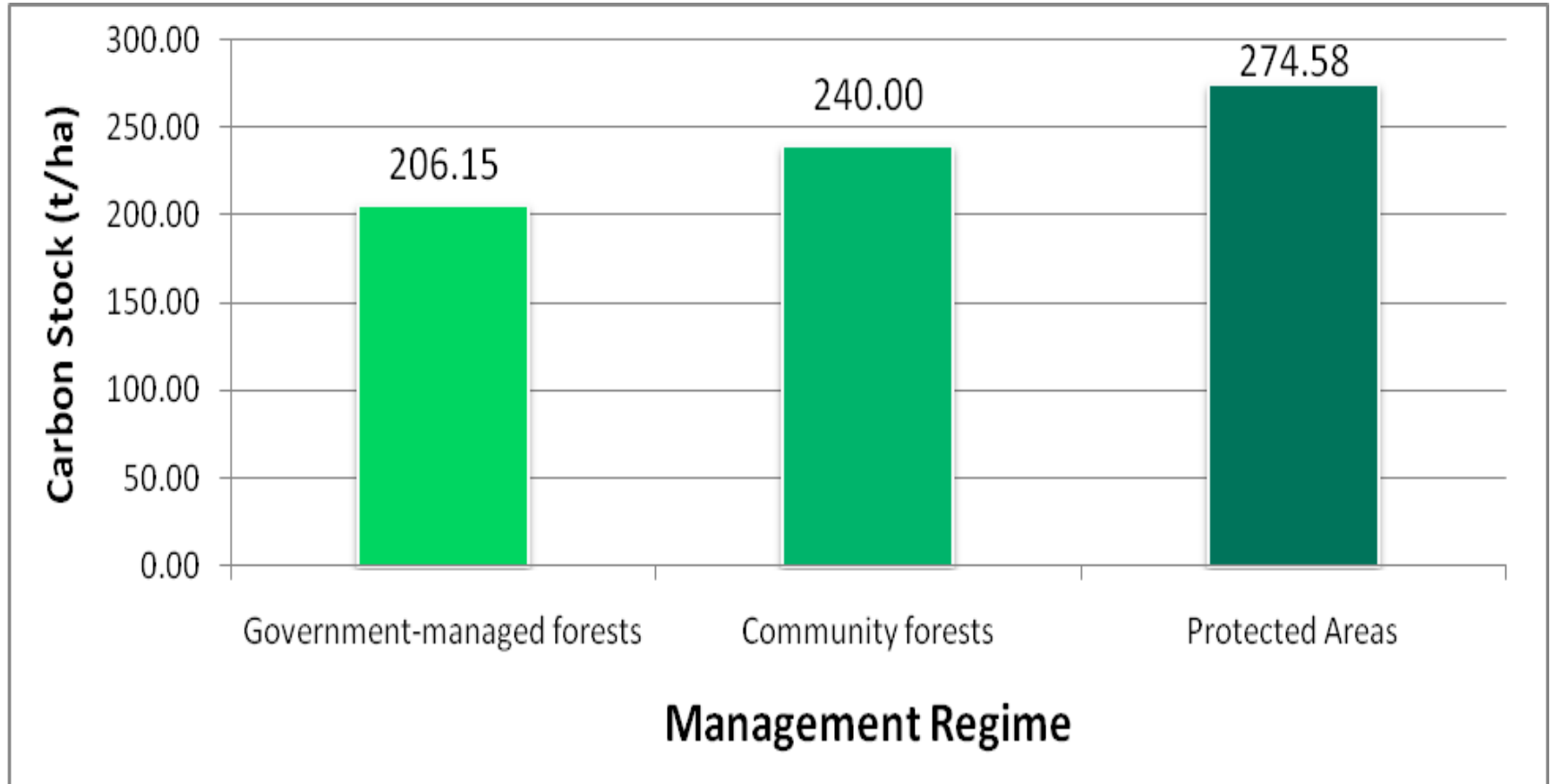
Total avoided emissions until 2050 and carbon price estimations

- **Total Avoided Deforestation, Area in ha** **54,854**
- Average C stock per ha 171.29
- Residual C stock per ha 109.83
- Change in C stock 61.46
- Avoided C emission (tC) 3,371,476
- **Reduced emission (CO2e in t) from avoided deforestation** **12,373,316**

Reduced Emission from avoided Deforestation (T CO2e)	Carbon Revenue per CO2e unit prices (in US \$)				
	3	4	5	6	7
12 373 316,0	37 119 948,0	49 493 264,0	61 866 580,0	74 239 896,0	86 613 212,0
Annual Average	927 998,7	1 237 331,6	1 546 664,5	1 855 997,4	2 165 330,3
\$ /per hectare	0,84	1,12	1,41	1,69	1,97



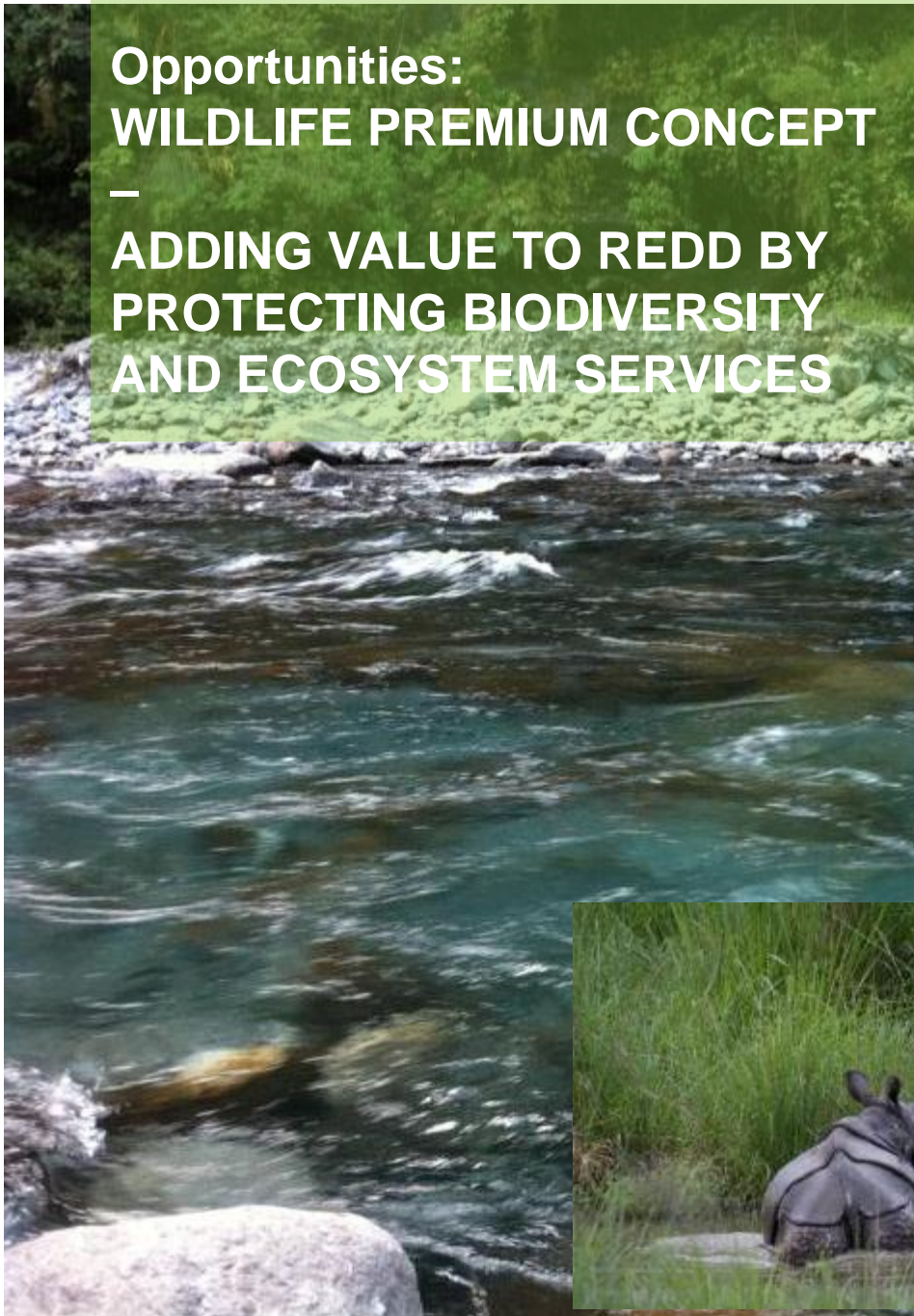
Carbon stock under different forest management regimes in terai



HOW TO MAKE REDD BENEFICIAL?

The opportunity costs of reducing emissions from deforestation and forest degradation in the Terai Arc Landscape is comparatively higher than those earlier regional estimates. This is possibly because of high productivity of the land and price of the agricultural products.

**Opportunities:
WILDLIFE PREMIUM CONCEPT
—
ADDING VALUE TO REDD BY
PROTECTING BIODIVERSITY
AND ECOSYSTEM SERVICES**



ENHANCING COOPERATION WITH DIFFERENT STAKEHOLDERS





Cooperation with academia and students





Cooperation with national and international REDD development



Regional and South-South cooperation; sharing experiences with Bhutan, Malaysia and more





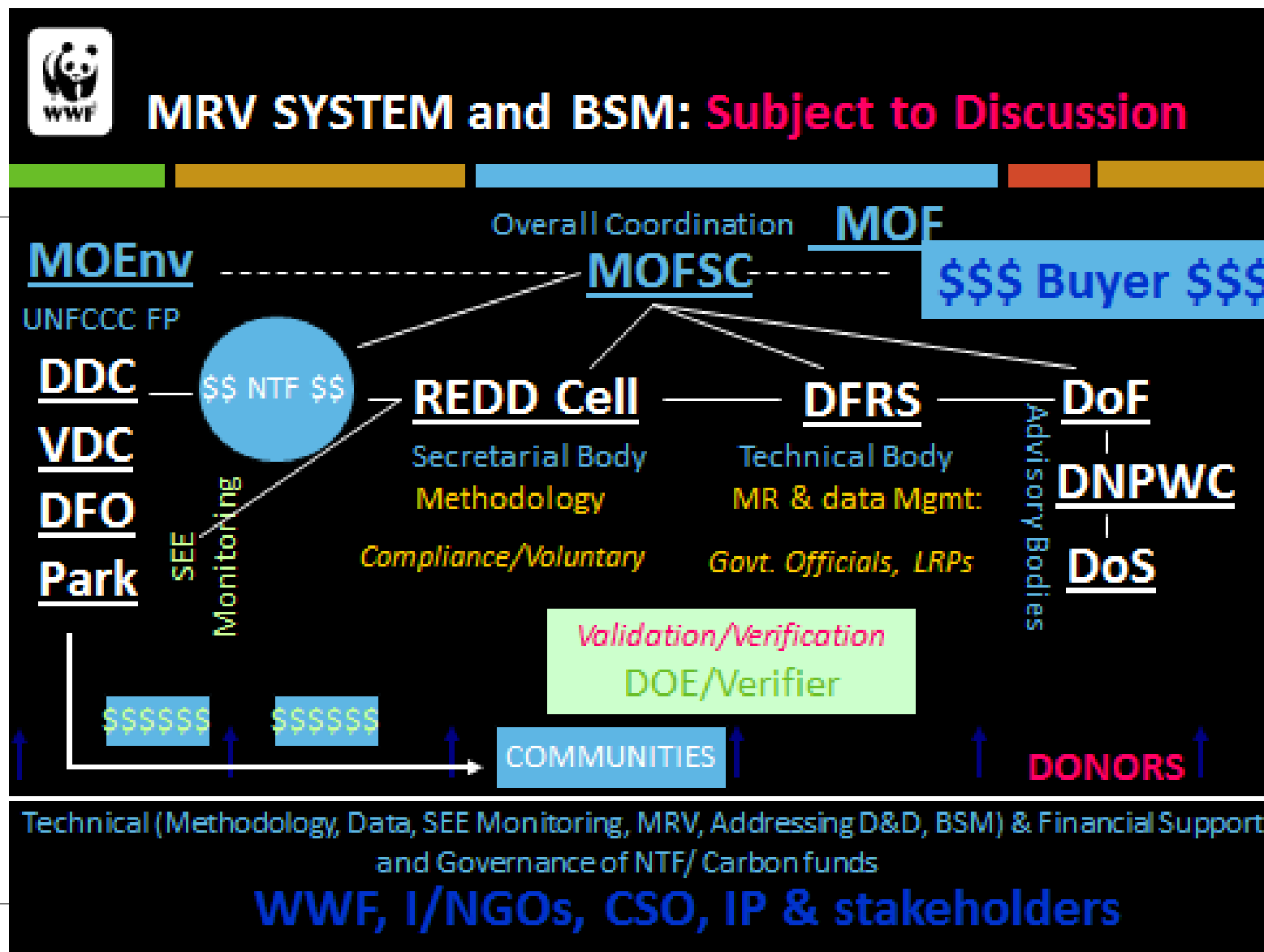
Way forward – challenges and opportunities!

- **National vs. sub-national baseline?**
- **Social and Environmental safeguards?**
- **Monitoring/Reporting System (integrating local systems nationally)?**
- **Third Party Verification Costs ?**
- **Institutionalization and government ownership?**
- **Fund vs. market based approach?**
- **Quantifying degradation (RED- REDD- REDD+)?**
- **Forest Management regimes?**
- **Terminologies and definitions?**
- **Benefit sharing?**





Challenges – benefit sharing....

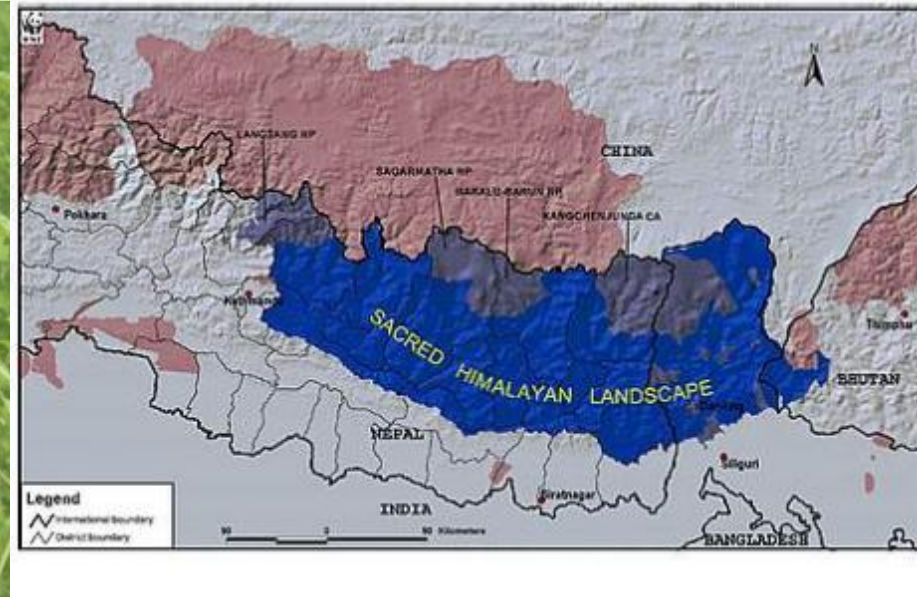


Sacred Himalayan Landscape 2011 ->

Training local LRPs

Conducting field inventory and biodiversity monitoring with the help of students

Planning LiDAR works





TUETTU ULKOMINISTERIÖN
KEHITYSYHTEISTYÖVAROIN

THANK YOU!

