Table A5-28. Analysis of a Reforestation Mitigation Option, Country Lebanon

REFORESTATION	1994	2000	2005	2015	2040	
>>>> FROM STEPS 2 AND 3: LAND AREA (ha)						
>> Baseline Scenario						
> Wasteland	207,000	207,000	197,000	182,000	169,000	
>> Mitigation Scenario						
> Wasteland	207,000	207,000	192,000	142,000	0	
> Reforested Land			15,000	50,000	142,000	
>>>> STEP 4: ESTIMATING CARBON POOL AND SEQUESTRATION						
>>> STEP 4.1: BASELINE SCENARIO -- WASTELANDS						
>> Vegetation Carbon						
> Dry Biomass Weight (t/ha)			5	5	5	
> Carbon content (ratio)			0.5	0.5	0.5	
>> Soil Carbon						
> Amount of carbon stored in soil (tC/ha)			20	20	20	
>>> Carbon Pool (tC/ha)			22.25	22.25	22.25	
>>> STEP 4.2: MITIGATION SCENARIO -- REFORESTATION						
>> 4.2.1. Vegetation Carbon			93.75	93.75	93.75	
> Rotation Age (Years)			125	125	125	
> Annual Biomass Growth (t/ha/yr)			3	3	3	
> Mean Annual Increment (m3/ha/yr)			3	3	3	
> Expansion factor*						
> Carbon content (ratio)			0.5	0.5	0.5	
>> 4.2.2. Soil Carbon			250	250	250	
> Storage Period (Years)			125	125	125	
> Annual Increment in soil carbon (tC/ha/yr)			2	2	2	
>> 4.2.3. Decomposing Matter Carbon			15	15	15	
> Decomposition Period (Years)			6	6	6	

> Carbon from annual decomposition (tC/ha)			5	5	5		
>> 4.2.4. Product Carbon			4.8	4.8	4.8		
> Average product lifetime (yrs)			40	40	40		
> Amount of carbon stored in product (tC/ha)			30	30	30		
>>> Mean Carbon Storage (tC/ha)			364	364	364		
>>> Carbon Pool (tC/ha)			384	384	384		
>>> STEP 4.3: TOTAL CARBON DENSITY (tC/ha)							
>> Baseline Scenario							
> Wasteland			22.25	22.25	22.25		
>> Mitigation Scenario							
> Wasteland			22.25	22.25	22.25		
> Reforested Land			384	384	384		
>>>> STEP 5: ESTIMATING COSTS AND BENEFITS							
>>> STEP 5.1: COSTS ($/ha)							
>> Baseline Scenario (Wastelands)		5	5	5	5		
>> Mitigation Scenario (Reforestation)		2303	2303	2303	2303		
>> Discount Rate	15%						
>>> STEP 5.1.1: STREAM OF COSTS ($/ha)							
>> Initial Costs			1500	800	500		
>> Recurrent (Maintenance etc.) Costs			10	20	30		
>> Monitoring Costs			5	10	15		
>> Establishment Costs							
>> Total Costs			1515	830	545		
>> Present Value of Costs		2303					
>>> STEP 5.2: BENEFITS ($/ha)							
>> Baseline Scenario (Wastelands)		20	20	20	20		
>> Mitigation Scenario (Reforestation)		37,045	37,045	37,045	37,045		
>>> STEP 5.2.1: STREAM OF BENEFITS ($/ha)							
>> Timber Product					37,000		
>> Non-timber benefits (fuel wood)			5	10	15		
>> Non-timber benefits (raisin)			2.5	5	7.5		
>> Other benefits							

>> Total Benefits			7.5	15	37,022.5	
>> Present Value of Benefits		37,045				
>>> NET PRESENT VALUE OF BENEFITS ($/ha)		34,742				
>>> STEP 6.1: TOTAL CARBON POOL (tC)						< Total >
>> Annual Incremental C Sequestered			1,806,500	12,645,500	46,318,450	60,770,450
>> Baseline Scenario						
> Wasteland			4,383,250	4,049,500	3,760,250	
>> Mitigation Scenario			6,189,750	18,501,500	64,819,950	
> Wasteland			4,272,000	3,159,500	0	
> Reforested Land			1,917,750	15,342,000	64,819,950	
						Present
>>> STEP 6.2: TOTAL COSTS AND BENEFITS OF CSEQ ($)						Value($)
>> Incremental Net Benefit			521,049,946.6	1,736,483,155.3	4,930,781,160.9	5,008,186,303.2
>> Baseline Scenario Benefit			2,955,000	2,730,000	2,535,000	6,300,641.1
> Cost			985,000	910,000	845,000	2,100,213.7
> Benefit			3,940,000	3,640,000	3,380,000	8,400,854.8
>> Mitigation Scenario Benefit			524,004,946.6	1,739,213,155.3	4,933,316,160.9	5,014,486,944.2
> Cost			35,510,053.4	115,876,844.7	327,073,839.1	333,554,208.1
> Benefit			559,515,000	1,855,090,000	5,260,390,000	5,348,041,152.3
>>> STEP 7: COST-EFFECTIVENESS INDICATORS						
>> Net Present Value of Benefits						
> $/tC						82.41
> $/ha.						24,194
>> Benefit of Reducing Atmospheric Carbon (BRAC)						
> $/tC-yr.						6.181
>> Initial Cost						
> $/tC						7.62
> $/ha.						2238
>> Endowment (Present Value of Costs)						
> $/tC						5.49
> $/ha.						1611

NOTES:

1. Discount rates

2. Change initial cost.
3. Change the amount of carbon in soil and vegetation.
4. Change the product carbon proportion.
5. Change the benefit amounts.
6. Change the reforested land scenario.

Expansion Factor = Wood AS*TA*DW

where;

AS = Aboveground over Stemwood volume ratio

TA = Total to Aboveground biomass ratio

DW = Dry to Wet biomass ratio