Bwindi Forest Ecosystem Cost-Benefit Analysis of two Scenarios

Basic Data,List of Assumptions and Estimations

- **Existing Scenario Costs are Assumed to be Operation & Managment Costs**
- Existing Scenario Benefits are entrance and park service revenues
- **Proposed Scenario Costs include project investiment cost in the first year**
- Proposed Scenario Benefits includes additional revenues to government and community
- **Government is major stakeholder to implment the project as a public project**
- Lower dicount rate is taken than market rate as a social discount rate
- **NPV is chosen to calculate the cost-benefit**
- There is an increamental benefit year to year
- **NPV of increamental benefit is the difference of NPV of the two scenarios**

Discounted Rate r= $ 0.07 **Discount Factor =$(1/1+r)^y$**

With Project(Proposed Scenario)			Year					
		Year=y	1	2	3	4	Total	
	A=	*Cost*	$ 200,000	$ 20,000	$ 22,000	$ 25,000	$	**267,000**
B=		*Discounted Factor*	$ 0.93	$ 0.87	$ 0.82	$ 0.76		
(PVC)	*(A*B)*	*Discounted Cost*	$ 186,916	$ 17,469	$ 17,959	$ 19,072	$	**241,416**
	C=	*Benefits*	$ 700,000	$ 1,100,000	$ 1,175,000	$ 1,225,000	$	**4,200,000**
D=		*Discounted Factor*	$ 0.93	$ 0.87	$ 0.82	$ 0.76		
(PVB)	*(C*D)*	*Discounted Benefit*	$ 654,206	$ 960,783	$ 959,150	$ 934,547	$	**3,508,685**
(C-A)		*Net Benefit*	$ 500,000	$ 1,080,000	$ 1,153,000	$ 1,200,000	$	**3,933,000**
(PVB-PVC)		*Net Present Value*	$ 467,290	$ 943,314	$ 941,191	$ 915,474	$	**3,267,269**

With Out Project(Current Scenario)			Year					
			1	2	3	4	Total	
	E=	*Cost*	$ 15,000	$ 20,000	$ 22,000	$ 25,000	$	**82,000**
F=		*Discounted Factor*	$ 0.93	$ 0.87	$ 0.82	$ 0.76		
(PVC)	*(E*F)*	*Discounted Cost*	$ 14,019	$ 17,469	$ 17,959	$ 19,072	$	**68,518**
	G=	*Benefits*	$ 700,000	$ 1,000,000	$ 1,100,000	$ 1,150,000	$	**3,950,000**
H=		*Discounted Factor*	$ 0.93	$ 0.87	$ 0.82	$ 0.76		
(PVB)	*(G*H)*	*Discounted Benefit*	$ 654,206	$ 873,439	$ 897,928	$ 877,329	$	**3,302,901**
(G-E)		*Net Benefit*	$ 685,000	$ 980,000	$ 1,078,000	$ 1,125,000	$	**3,868,000**
(PVB-PVC)		*Net Present Value*	$ 640,187	$ 855,970	$ 879,969	$ 858,257	$	**3,234,383**
((C-A)-(G-E))=I		*Net Increamental Benefit (Net benefit with project less Net benefit without project)*	$ (185,000)	$ 100,000	$ 75,000	$ 75,000		
J=		*Discounted Factor*	$ 0.93	$ 0.87	$ 0.82	$ 0.76		
(PVIB)	*(I*J)*	*Net Increamental Benefit*	$ (172,897)	$ 87,344	$ 61,222	$ 57,217		
Economic Net Present Value="SUM(Net Increamental Benefit")					$	**32,886**		

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- **NPV is chosen to calculate the cost-benefit**
- There is an increamental benefit year to year
- **NPV of increamental benefit is the difference of NPV of the two scenarios**

Discounted Rate r= $ 0.12 **Discount Factor =$(1/1+r)^y$**

With Project(Proposed Scenario)			Year=y	1	2	3	4	Total
		A=	Cost	$ 200,000	$ 20,000	$ 22,000	$ 25,000	**$ 267,000**
	B=		Discounted Factor	$ 0.89	$ 0.80	$ 0.71	$ 0.64	
(PVC)	(A*B)		Discounted Cost	$ 178,571	$ 15,944	$ 15,659	$ 15,888	**$ 226,062**
		C=	Benefits	$ 700,000	$ 1,100,000	$ 1,175,000	$ 1,225,000	**$ 4,200,000**
	D=		Discounted Factor	$ 0.89	$ 0.80	$ 0.71	$ 0.64	
(PVB)	(C*D)		Discounted Benefit	$ 625,000	$ 876,913	$ 836,342	$ 778,510	**$ 3,116,765**
	(C-A)		Net Benefit	$ 500,000	$ 1,080,000	$ 1,153,000	$ 1,200,000	**$ 3,933,000**
	(PVB-PVC)	Net Present	Value	$ 446,429	$ 860,969	$ 820,683	$ 762,622	**$ 2,890,702**

With Out Project(Current Scenario)				Year 1	2	3	4	Total
		E=	Cost	$ 15,000	$ 20,000	$ 22,000	$ 25,000	**$ 82,000**
	F=		Discounted Factor	$ 0.89	$ 0.80	$ 0.71	$ 0.64	
(PVC)	(E*F)		Discounted Cost	$ 13,393	$ 15,944	$ 15,659	$ 15,888	**$ 60,884**
		G=	Benefits	$ 700,000	$ 1,000,000	$ 1,100,000	$ 1,150,000	**$ 3,950,000**
	H=		Discounted Factor	$ 0.89	$ 0.80	$ 0.71	$ 0.64	
(PVB)	(G*H)		Discounted Benefit	$ 625,000	$ 797,194	$ 782,958	$ 730,846	**$ 2,935,998**
	(G-E)		Net Benefit	$ 685,000	$ 980,000	$ 1,078,000	$ 1,125,000	**$ 3,868,000**
	(PVB-PVC)	Net Present	Value	$ 611,607	$ 781,250	$ 767,299	$ 714,958	**$ 2,875,114**
((C-A)-(G-E))=I			Net Increamental Benefit (Net benefit with project less Net	$ (185,000)	$ 100,000	$ 75,000	$ 75,000	
	J=		Discounted Factor	$ 0.89	$ 0.80	$ 0.71	$ 0.64	
(PVIB)	(I*J) Net		Incremental Benefit	$ (165,179)	$ 79,719	$ 53,384	$ 47,664	

Economic Net Present Value="SUM(Net Increamental Benefit") **$ 15,588**

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- **NPV is chosen to calculate the cost-benefit**
- There is an increamental benefit year to year
- **NPV of increamental benefit is the difference of NPV of the two scenarios**

Discounted Rate r= $ 0.22 **Discount Factor =$(1/1+r)^y$**

With Project(Proposed Scenario)			Year=y	1	2	3	4	Total
		A=	Cost	$ 200,000	$ 20,000	$ 22,000	$ 25,000	$ 267,000
	B=		Discounted Factor	$ 0.82	$ 0.67	$ 0.55	$ 0.45	
(PVC)	(A*B)		Discounted Cost	$ 163,934	$ 13,437	$ 12,116	$ 11,285	$ 200,772
		C=	Benefits	$ 700,000	$ 1,100,000	$ 1,175,000	$ 1,225,000	$ 4,200,000
	D=		Discounted Factor	$ 0.82	$ 0.67	$ 0.55	$ 0.45	
(PVB)	(C*D)		Discounted Benefit	$ 573,770	$ 739,049	$ 647,081	$ 552,964	$ 2,512,864
	(C-A)		Net Benefit	$ 500,000	$ 1,080,000	$ 1,153,000	$ 1,200,000	$ 3,933,000
	(PVB-PVC)		Net Present Value	$ 409,836	$ 725,611	$ 634,965	$ 541,679	$ 2,312,091

With Out Project(Current Scenario)			Year	1	2	3	4	Total
		E=	Cost	$ 15,000	$ 20,000	$ 22,000	$ 25,000	$ 82,000
	F=		Discounted Factor	$ 0.82	$ 0.67	$ 0.55	$ 0.45	
(PVC)	(E*F)		Discounted Cost	$ 12,295	$ 13,437	$ 12,116	$ 11,285	$ 49,133
		G=	Benefits	$ 700,000	$ 1,000,000	$ 1,100,000	$ 1,150,000	$ 3,950,000
	H=		Discounted Factor	$ 0.82	$ 0.67	$ 0.55	$ 0.45	
(PVB)	(G*H)		Discounted Benefit	$ 573,770	$ 671,862	$ 605,778	$ 519,109	$ 2,370,519
	(G-E)		Net Benefit	$ 685,000	$ 980,000	$ 1,078,000	$ 1,125,000	$ 3,868,000
	(PVB-PVC)		Net Present Value	$ 561,475	$ 658,425	$ 593,662	$ 507,824	$ 2,321,387

((C-A)-(G-E))=I		Net Increamental Benefit (Net benefit with project less Net	$ (185,000)	$ 100,000	$ 75,000	$ 75,000	
	J=	Discounted Factor	$ 0.82	$ 0.67	$ 0.55	$ 0.45	
(PVIB)	(I*J)	Net Increamental Benefit	$ (151,639)	$ 67,186	$ 41,303	$ 33,855	

Economic Net Present Value="SUM(Net Increamental Benefit") $ (9,295)