

事業費集計表

事業名:緑資源幹線林道事業

都道府県名:岡山県・広島県

施工箇所:粟倉・木屋原線

(単位:千円)

年度	事業費			年度	事業費		
48	186,510	× 4.44	827,883	21	4,672	× 1.08	5,054
49	318,519	× 4.27	1,359,469	22	4,672	× 1.04	4,859
50	429,261	× 4.10	1,761,658	23	4,672	× 1.00	4,672
51	439,477	× 3.95	1,734,216	24	4,672	× 0.96	4,493
52	695,532	× 3.79	2,639,069	25	4,672	× 0.92	4,320
53	672,322	× 3.65	2,452,886	26	4,672	× 0.89	4,154
54	753,502	× 3.51	2,643,328	27	4,672	× 0.85	3,994
55	740,344	× 3.37	2,497,279	28	4,672	× 0.82	3,840
56	747,457	× 3.24	2,424,299	29	4,672	× 0.79	3,693
57	792,893	× 3.12	2,472,758	30	4,672	× 0.76	3,551
58	706,396	× 3.00	2,118,271	31	4,672	× 0.73	3,414
59	565,288	× 2.88	1,629,933	32	4,672	× 0.70	3,283
60	801,744	× 2.77	2,222,811	33	4,672	× 0.68	3,156
61	899,847	× 2.67	2,398,844	34	4,672	× 0.65	3,026
62	764,289	× 2.56	1,959,104	35	4,672	× 0.62	2,910
63	847,963	× 2.46	2,089,987	36	4,307	× 0.60	2,579
1	1,052,694	× 2.37	2,494,798	37	3,557	× 0.58	2,046
2	1,330,523	× 2.28	3,031,953	38	3,557	× 0.56	1,968
3	1,307,601	× 2.19	2,865,114	39	3,557	× 0.53	1,892
4	1,775,549	× 2.11	3,740,814	40	2,882	× 0.51	1,473
5	1,551,500	× 2.03	3,143,056	41	2,882	× 0.49	1,416
6	791,971	× 1.95	1,542,681	42	2,533	× 0.47	1,202
7	1,044,140	× 1.87	1,955,655	43	2,533	× 0.46	1,156
8	745,374	× 1.80	1,342,377	44	2,209	× 0.44	969
9	587,829	× 1.73	1,017,929	45	2,209	× 0.42	932
10	760,781	× 1.67	1,266,756	46	1,331	× 0.41	540
11	598,044	× 1.60	957,488	47	1,331	× 0.39	519
12	625,968	× 1.54	963,649	48	1,268	× 0.38	476
13	424,750	× 1.48	628,733	49	1,268	× 0.36	457
14	578,482	× 1.42	823,360	50	1,268	× 0.35	440
15	308,190	× 1.37	421,779	51	585	× 0.33	195
16	210,866	× 1.32	277,485	52	585	× 0.32	188
17	4,672	× 1.27	5,912	53	585	× 0.31	180
18	4,672	× 1.22	5,685	54	585	× 0.30	173
19	4,672	× 1.17	5,466	55	585	× 0.29	167
20	4,672	× 1.12	5,256	56	585	× 0.27	160
合計				59,805,287			
事業実施計画期間事業費:		59,564,636 千円		総費用(C) = 23,983,059 ÷ 23,983,059 × 59,805,287			
事業実施計画期間維持管理費:		72,544 千円		内維持管理費 = 23,983,059 ÷ 23,983,059 × 240,650			
総事業費(維持管理費除く):		23,983,059 千円					
全体計画総事業費:		23,983,059 千円		C= 59,805,287 千円 240,650 千円			

4 木材生産等便益
(1)木材生産経費縮減便益

804,273 千円

$$B = \sum_{t=1}^T \frac{t \times (C_o - C_T) \times V_t}{T \times (1 + i)^t} + \sum_{t=T+1}^Y \frac{(C_o - C_T) \times V_t}{(1 + i)^t}$$

T:	整備期間(年)		32
Y:	評価期間(年)		72
Co:	整備前の伐採・搬出等経費(円/m3)	9,452	~ 10,292
CT:	整備後の伐採・搬出等経費(円/m3)	2,822	~ 3,120
Vt:	路網整備前からの利用区域のt年後における伐採材積(m3)	0.00	~ 16,804.24

便益算出表

(単位:千円)

評価期間	経過年	年度	割引係数	伐採材積(m3)	年効果額 ①	効果発生割合 ②	年発生効果額 ③=①×②	現在価値 ④=③×割引係数他
1	0	48	4.44	0.0	0	10%~100%	0	0
2	0	49	4.27	0.0	0	10%~100%	0	0
3	0	50	4.10	0.0	0	10%~100%	0	0
4	0	51	3.95	0.0	0	10%~100%	0	0
5	0	52	3.79	0.0	0	10%~100%	0	0
6	0	53	3.65	0.0	0	10%~100%	0	0
7	0	54	3.51	0.0	0	10%~100%	0	0
8	0	55	3.37	0.0	0	10%~100%	0	0
9	0	56	3.24	0.0	0	10%~100%	0	0
10	0	57	3.12	0.0	0	10%~100%	0	0
11	0	58	3.00	0.0	0	10%~100%	0	0
12	0	59	2.88	6,377.3	45,738	10%~100%	10,062	7,253
13	0	60	2.77	7,267.0	52,119	10%~100%	12,806	15,470
14	0	61	2.67	13,693.9	98,213	10%~100%	21,745	43,212
15	0	62	2.56	13,693.9	98,213	10%~100%	21,745	55,449
16	0	63	2.46	14,079.2	100,927	10%~100%	23,029	54,235
17	0	1	2.37	14,079.2	100,927	10%~100%	23,029	53,032
18	0	2	2.28	14,079.2	100,927	10%~100%	23,029	51,712
19	0	3	2.19	1,787.4	12,542	10%~100%	4,786	10,240
20	0	4	2.11	3,382.0	23,979	10%~100%	16,223	13,407
21	0	5	2.03	3,382.0	23,979	10%~100%	16,223	16,315
22	0	6	1.95	3,382.0	23,979	10%~100%	16,223	18,870
23	0	7	1.87	5,887.4	41,947	10%~100%	20,894	22,080
24	0	8	1.80	1,808.6	12,971	10%~100%	5,823	6,286
25	0	9	1.73	1,808.6	12,971	10%~100%	5,823	7,095
26	0	10	1.67	1,808.6	12,971	10%~100%	5,823	7,832
27	0	11	1.60	1,808.6	12,971	10%~100%	5,823	7,829
28	0	12	1.54	1,808.6	12,971	10%~100%	5,823	7,815
29	0	13	1.48	480.8	3,449	10%~100%	2,338	3,381
30	0	14	1.42	480.8	3,449	10%~100%	2,338	3,277
31	0	15	1.37	480.8	3,449	10%~100%	2,338	3,175
32	0	16	1.32	480.8	3,449	10%~100%	2,338	3,077
33	1	17	1.27	480.8	3,449	10%~100%	2,338	2,958
34	2	18	1.22	480.8	3,449	10%~100%	2,338	2,845
35	3	19	1.17	480.8	3,449	10%~100%	2,338	2,735
36	4	20	1.12	480.8	3,449	10%~100%	2,338	2,630
37	5	21	1.08	480.8	3,449	10%~100%	2,338	2,529
38	6	22	1.04	480.8	3,449	10%~100%	2,338	2,432
39	7	23	1.00	402.8	2,889	10%~100%	1,797	1,797
40	8	24	0.96	402.8	2,889	10%~100%	1,797	1,728
41	9	25	0.92	402.8	2,889	10%~100%	1,797	1,662
42	10	26	0.89	402.8	2,889	10%~100%	1,797	1,598
43	11	27	0.85	402.8	2,889	10%~100%	1,797	1,536
44	12	28	0.82	5,632.9	40,390	10%~100%	17,751	14,590
45	13	29	0.79	5,632.9	40,390	10%~100%	17,751	14,029
46	14	30	0.76	5,632.9	40,390	10%~100%	17,751	13,490
47	15	31	0.73	5,632.9	40,390	10%~100%	17,751	12,971
48	16	32	0.70	5,632.9	40,390	10%~100%	17,751	12,472
49	17	33	0.68	4,367.3	31,320	10%~100%	19,153	12,939
50	18	34	0.65	4,367.3	31,320	10%~100%	19,153	12,358
51	19	35	0.62	4,367.3	31,320	10%~100%	19,153	11,882
52	20	36	0.60	4,367.3	31,320	10%~100%	19,153	11,425
53	21	37	0.58	4,367.3	31,320	10%~100%	19,153	10,986
54	22	38	0.56	2,914.7	20,904	10%~100%	12,042	6,661
55	23	39	0.53	2,914.7	20,904	10%~100%	12,042	6,405
56	24	40	0.51	2,887.0	20,705	10%~100%	11,999	6,136
57	25	41	0.49	2,887.0	20,705	10%~100%	11,999	5,900
58	26	42	0.47	2,498.9	17,921	10%~100%	10,802	5,127
59	27	43	0.46	9,373.5	67,218	10%~100%	44,057	20,107
60	28	44	0.44	7,363.3	52,801	10%~100%	35,696	15,664
61	29	45	0.42	7,363.3	52,801	10%~100%	35,696	15,062
62	30	46	0.41	7,347.3	52,695	10%~100%	35,685	14,478
63	31	47	0.39	7,347.3	52,695	10%~100%	35,685	13,921
64	32	48	0.38	16,804.2	120,520	10%~100%	95,276	35,740
65	33	49	0.36	16,804.2	120,520	10%~100%	95,276	34,365
66	34	50	0.35	16,804.2	120,520	10%~100%	95,276	33,043
67	35	51	0.33	4,756.5	34,114	10%~100%	8,870	2,958
68	36	52	0.32	4,756.5	34,114	10%~100%	8,870	2,844
69	37	53	0.31	10,701.2	76,749	10%~100%	19,955	6,152
70	38	54	0.30	10,701.2	76,749	10%~100%	19,955	5,916
71	39	55	0.29	10,701.2	76,749	10%~100%	19,955	5,688
72	40	56	0.27	10,701.2	76,749	10%~100%	19,955	5,469
合計(便益額)								804,273

4 木材生産等便益
(2) 木材利用増進便益

228,056 千円

$$B = \sum_{t=1}^Y \frac{(RT - Ro) / 100 \times Vt \times @}{(1 + i)^t}$$

Y:	評価期間(年)	72
Ro:	整備前の利用間伐の割合(%)	0% ~ 40%
RT:	整備後の利用間伐の割合(%)	50% ~ 76%
Vt:	林道整備前からの利用区域の t 年後における間伐採材積(m3)	0.00 ~ 2,511.25
@:	間伐材の木材市場価格(円/m3)	23,931 ~ 33,322

便益算出表

(単位:千円)

評価期間	経過年	年度	割引係数 ①	伐採材積(m3)	年効果額 ②	効果発生割合 ③	年発生効果額 ④=②×③	現在価値 ⑤=④×①
1	0	48	4.44	0.0	0	10%~100%	0	0
2	0	49	4.27	0.0	0	10%~100%	0	0
3	0	50	4.10	0.0	0	10%~100%	0	0
4	0	51	3.95	0.0	0	10%~100%	0	0
5	0	52	3.79	0.0	0	10%~100%	0	0
6	0	53	3.65	0.0	0	10%~100%	0	0
7	0	54	3.51	0.0	0	10%~100%	0	0
8	0	55	3.37	0.0	0	10%~100%	0	0
9	0	56	3.24	0.0	0	10%~100%	0	0
10	0	57	3.12	0.0	0	10%~100%	0	0
11	0	58	3.00	0.0	0	10%~100%	0	0
12	0	59	2.88	0.0	0	10%~100%	0	0
13	0	60	2.77	15.6	499	10%~100%	215	595
14	0	61	2.67	15.6	499	10%~100%	215	572
15	0	62	2.56	15.6	499	10%~100%	215	550
16	0	63	2.46	208.2	5,238	10%~100%	1,078	2,656
17	0	1	2.37	208.2	5,238	10%~100%	1,078	2,554
18	0	2	2.28	208.2	5,238	10%~100%	1,078	2,456
19	0	3	2.19	208.2	5,238	10%~100%	1,078	2,361
20	0	4	2.11	260.2	6,909	10%~100%	2,749	5,791
21	0	5	2.03	260.2	6,909	10%~100%	2,749	5,568
22	0	6	1.95	260.2	6,909	10%~100%	2,749	5,354
23	0	7	1.87	284.3	7,604	10%~100%	2,929	5,487
24	0	8	1.80	284.3	7,604	10%~100%	2,929	5,276
25	0	9	1.73	284.3	7,604	10%~100%	2,929	5,073
26	0	10	1.67	284.3	7,604	10%~100%	2,929	4,878
27	0	11	1.60	284.3	7,604	10%~100%	2,929	4,690
28	0	12	1.54	284.3	7,604	10%~100%	2,929	4,510
29	0	13	1.48	284.3	7,604	10%~100%	2,929	4,336
30	0	14	1.42	284.3	7,604	10%~100%	2,929	4,169
31	0	15	1.37	284.3	7,604	10%~100%	2,929	4,009
32	0	16	1.32	284.3	7,604	10%~100%	2,929	3,855
33	1	17	1.27	284.3	7,604	10%~100%	2,929	3,707
34	2	18	1.22	284.3	7,604	10%~100%	2,929	3,564
35	3	19	1.17	284.3	7,604	10%~100%	2,929	3,427
36	4	20	1.12	284.3	7,604	10%~100%	2,929	3,295
37	5	21	1.08	284.3	7,604	10%~100%	2,929	3,168
38	6	22	1.04	284.3	7,604	10%~100%	2,929	3,047
39	7	23	1.00	248.9	6,642	10%~100%	2,318	2,318
40	8	24	0.96	805.7	25,198	10%~100%	6,400	6,154
41	9	25	0.92	805.7	25,198	10%~100%	6,400	5,917
42	10	26	0.89	805.7	25,198	10%~100%	6,400	5,690
43	11	27	0.85	805.7	25,198	10%~100%	6,400	5,471
44	12	28	0.82	1033.9	33,874	10%~100%	7,986	6,564
45	13	29	0.79	1033.9	33,874	10%~100%	7,986	6,312
46	14	30	0.76	1033.9	33,874	10%~100%	7,986	6,069
47	15	31	0.73	1033.9	33,874	10%~100%	7,986	5,836
48	16	32	0.70	1033.9	33,874	10%~100%	7,986	5,611
49	17	33	0.68	1171.8	37,037	10%~100%	9,929	6,708
50	18	34	0.65	1171.8	37,037	10%~100%	9,929	6,425
51	19	35	0.62	1171.8	37,037	10%~100%	9,929	6,178
52	20	36	0.60	1171.8	37,037	10%~100%	9,929	5,940
53	21	37	0.58	1171.8	37,037	10%~100%	9,929	5,712
54	22	38	0.56	2511.2	79,637	10%~100%	21,701	12,030
55	23	39	0.53	2511.2	79,637	10%~100%	21,701	11,568
56	24	40	0.51	685.5	18,801	10%~100%	8,317	4,252
57	25	41	0.49	685.5	18,801	10%~100%	8,317	4,088
58	26	42	0.47	619.6	16,684	10%~100%	7,407	3,515
59	27	43	0.46	608.2	15,860	10%~100%	4,593	2,096
60	28	44	0.44	515.9	13,235	10%~100%	3,071	1,348
61	29	45	0.42	515.9	13,235	10%~100%	3,071	1,296
62	30	46	0.41	152.6	4,541	10%~100%	2,201	893
63	31	47	0.39	152.6	4,541	10%~100%	2,201	859
64	32	48	0.38	164.5	4,959	10%~100%	2,861	1,073
65	33	49	0.36	164.5	4,959	10%~100%	2,861	1,032
66	34	50	0.35	164.5	4,959	10%~100%	2,861	992
67	35	51	0.33	98.4	2,836	10%~100%	737	246
68	36	52	0.32	98.4	2,836	10%~100%	737	236
69	37	53	0.31	77.8	2,243	10%~100%	583	180
70	38	54	0.30	77.8	2,243	10%~100%	583	173
71	39	55	0.29	77.8	2,243	10%~100%	583	166
72	40	56	0.27	77.8	2,243	10%~100%	583	160
合計(便益額)								228,056

5 森林整備経費削減等便益

402 千円

(1) 造林作業経費削減便益

① 歩行時間等経費削減便益

$$B = \sum_{t=1}^T \frac{t \times (C_o - C_T) \times V_t}{T \times (1 + i)^t} + \sum_{t=T+1}^Y \frac{(C_o - C_T) \times V_t}{(1 + i)^t}$$

T:	整備期間(年)	32
Y:	評価期間(年)	72
Co:	整備前の造林等経費(円/ha)	31,232 ~ 80,923
CT:	整備後の造林等経費(円/ha)	27,253 ~ 75,983
Vt:	林道が整備されない場合の t 年後の造林面積 (ha)	0.00 ~ 53.60

便益算出表

(単位:千円)

評価期間	経過年	年度	割引係数	造林面積(m3)	年効果額 ①	効果発生割合 ②	年発生効果額 ③=①×②	現在価値 ④=③×割引係数他
1	0	48	4.44	0.0	0	10%~100%	0	0
2	0	49	4.27	0.0	0	10%~100%	0	0
3	0	50	4.10	0.0	0	10%~100%	0	0
4	0	51	3.95	0.0	0	10%~100%	0	0
5	0	52	3.79	0.0	0	10%~100%	0	0
6	0	53	3.65	0.0	0	10%~100%	0	0
7	0	54	3.51	0.0	0	10%~100%	0	0
8	0	55	3.37	0.0	0	10%~100%	0	0
9	0	56	3.24	0.0	0	10%~100%	0	0
10	0	57	3.12	0.0	0	10%~100%	0	0
11	0	58	3.00	0.0	0	10%~100%	0	0
12	0	59	2.88	0.2	1	10%~100%	0	0
13	0	60	2.77	2.3	5	10%~100%	2	1
14	0	61	2.67	4.4	16	10%~100%	4	7
15	0	62	2.56	4.4	16	10%~100%	4	10
16	0	63	2.46	10.6	44	10%~100%	10	13
17	0	1	2.37	10.6	44	10%~100%	10	16
18	0	2	2.28	10.6	44	10%~100%	10	19
19	0	3	2.19	6.0	28	10%~100%	6	14
20	0	4	2.11	14.5	32	10%~100%	10	15
21	0	5	2.03	14.5	32	10%~100%	10	15
22	0	6	1.95	14.5	32	10%~100%	10	16
23	0	7	1.87	14.5	32	10%~100%	10	16
24	0	8	1.80	13.2	38	10%~100%	11	11
25	0	9	1.73	13.2	38	10%~100%	11	12
26	0	10	1.67	13.2	38	10%~100%	11	13
27	0	11	1.60	13.2	38	10%~100%	11	13
28	0	12	1.54	13.2	38	10%~100%	11	13
29	0	13	1.48	2.7	22	10%~100%	3	4
30	0	14	1.42	2.7	22	10%~100%	3	4
31	0	15	1.37	2.7	22	10%~100%	3	3
32	0	16	1.32	2.7	22	10%~100%	3	3
33	1	17	1.27	2.7	22	10%~100%	3	3
34	2	18	1.22	0.0	0	10%~100%	0	0
35	3	19	1.17	0.0	0	10%~100%	0	0
36	4	20	1.12	0.0	0	10%~100%	0	0
37	5	21	1.08	0.0	0	10%~100%	0	0
38	6	22	1.04	0.0	0	10%~100%	0	0
39	7	23	1.00	0.0	0	10%~100%	0	0
40	8	24	0.96	0.0	0	10%~100%	0	0
41	9	25	0.92	0.0	0	10%~100%	0	0
42	10	26	0.89	0.0	0	10%~100%	0	0
43	11	27	0.85	0.0	0	10%~100%	0	0
44	12	28	0.82	14.3	50	10%~100%	12	10
45	13	29	0.79	14.3	50	10%~100%	12	10
46	14	30	0.76	14.3	50	10%~100%	12	9
47	15	31	0.73	14.3	50	10%~100%	12	9
48	16	32	0.70	14.3	50	10%~100%	12	8
49	17	33	0.68	10.6	17	10%~100%	7	5
50	18	34	0.65	10.6	17	10%~100%	7	5
51	19	35	0.62	10.6	17	10%~100%	7	5
52	20	36	0.60	10.6	17	10%~100%	7	4
53	21	37	0.58	10.6	17	10%~100%	7	4
54	22	38	0.56	4.2	10	10%~100%	3	2
55	23	39	0.53	4.2	10	10%~100%	3	2
56	24	40	0.51	4.2	10	10%~100%	3	2
57	25	41	0.49	4.2	10	10%~100%	3	2
58	26	42	0.47	3.7	9	10%~100%	3	1
59	27	43	0.46	29.6	63	10%~100%	21	10
60	28	44	0.44	22.9	53	10%~100%	15	7
61	29	45	0.42	22.9	53	10%~100%	15	6
62	30	46	0.41	20.9	31	10%~100%	13	5
63	31	47	0.39	20.9	31	10%~100%	13	5
64	32	48	0.38	53.6	60	10%~100%	31	12
65	33	49	0.36	53.6	60	10%~100%	31	11
66	34	50	0.35	53.6	60	10%~100%	31	11
67	35	51	0.33	10.0	40	10%~100%	10	3
68	36	52	0.32	10.0	40	10%~100%	10	3
69	37	53	0.31	23.5	93	10%~100%	24	7
70	38	54	0.30	23.5	93	10%~100%	24	7
71	39	55	0.29	23.5	93	10%~100%	24	7
72	40	56	0.27	23.5	93	10%~100%	24	7
合計(便益額)								402

2,422,086 千円

5 森林整備経費縮減等便益

(4) 森林整備促進便益

- ① 水源かん養便益
- ア 洪水防止便益

$$B = \sum_{t=1}^{T-1} \frac{t}{T \times (1+i)^t} + \sum_{t=T}^Y \frac{1}{(1+i)^t} \times \frac{(f_1 - f_2) \times \alpha \times A \times U}{360}$$

U:	治水ダムの単位流量調節量当たりの年間減価償却費(円/m3/sec)	3,740,000
f1:	事業実施前の流出係数	0.55
f2:	事業実施後、T年経過後の流出係数	0.45
T:	事業実施後、流出係数が安定するのに必要な年数(年)	10
α:	100年確率時雨量(mm/h)	56.0 ~ 79.1
A:	事業対象区域面積(ha)	0.00 ~ 1,419.31
Y:	評価期間(年)	72
360:	単位合わせのための調整値	

便益算出表

(単位:千円)

評価期間	経過年	年度	割引係数 (1)	事業対象区域面積(ha)	年効果額 (2)	効果発生割合 (3)	年発生効果額 (4)=(2)×(3)	現在価値 (5)=(4)×(1)
1	0	48	4.44	4.7	60	42%~100%	174	770
2	0	49	4.27	14.1	184	42%~100%	520	2,221
3	0	50	4.10	28.1	365	42%~100%	1,037	4,257
4	0	51	3.95	46.9	592	42%~100%	1,732	6,836
5	0	52	3.79	73.6	993	42%~100%	2,734	10,372
6	0	53	3.65	108.2	1,568	42%~100%	4,041	14,743
7	0	54	3.51	150.9	2,321	42%~100%	5,663	19,865
8	0	55	3.37	201.5	3,247	42%~100%	7,590	25,801
9	0	56	3.24	255.9	4,285	42%~100%	9,666	31,352
10	0	57	3.12	314.4	5,438	42%~100%	11,903	37,123
11	0	58	3.00	376.9	6,706	42%~100%	14,297	42,871
12	0	59	2.88	439.0	8,039	42%~100%	16,681	48,097
13	0	60	2.77	500.9	9,447	42%~100%	19,062	52,849
14	0	61	2.67	560.9	10,878	42%~100%	21,370	56,968
15	0	62	2.56	619.1	12,362	42%~100%	23,606	60,508
16	0	63	2.46	672.8	13,782	42%~100%	25,646	63,211
17	0	1	2.37	722.0	15,143	42%~100%	27,495	65,161
18	0	2	2.28	766.0	16,415	42%~100%	29,131	66,383
19	0	3	2.19	804.6	17,603	42%~100%	30,557	66,955
20	0	4	2.11	841.4	18,753	42%~100%	31,913	67,235
21	0	5	2.03	876.9	19,890	42%~100%	33,212	67,282
22	0	6	1.95	910.7	20,993	42%~100%	34,445	67,096
23	0	7	1.87	942.9	22,064	42%~100%	35,615	66,706
24	0	8	1.80	972.4	23,071	42%~100%	36,671	66,042
25	0	9	1.73	1,001.4	24,069	42%~100%	37,705	65,293
26	0	10	1.67	1,028.9	25,028	42%~100%	38,685	64,414
27	0	11	1.60	1,056.0	25,984	42%~100%	39,645	63,472
28	0	12	1.54	1,081.2	26,882	42%~100%	40,546	62,419
29	0	13	1.48	1,105.3	27,751	42%~100%	41,409	61,296
30	0	14	1.42	1,128.4	28,578	42%~100%	42,229	60,105
31	0	15	1.37	1,150.1	29,363	42%~100%	43,003	58,852
32	0	16	1.32	1,171.0	30,112	42%~100%	43,738	57,556
33	1	17	1.27	1,191.1	30,834	42%~100%	44,441	56,232
34	2	18	1.22	1,208.8	31,476	42%~100%	45,060	54,823
35	3	19	1.17	1,225.2	32,072	42%~100%	45,637	53,388
36	4	20	1.12	1,240.2	32,618	42%~100%	46,170	51,935
37	5	21	1.08	1,253.1	33,093	42%~100%	46,641	50,447
38	6	22	1.04	1,265.1	33,539	42%~100%	47,088	48,972
39	7	23	1.00	1,275.0	33,901	42%~100%	47,463	47,463
40	8	24	0.96	1,283.4	34,216	42%~100%	47,784	45,946
41	9	25	0.92	1,290.5	34,486	42%~100%	48,057	44,432
42	10	26	0.89	1,296.1	34,700	42%~100%	48,273	42,915
43	11	27	0.85	1,300.7	34,881	42%~100%	48,452	41,417
44	12	28	0.82	1,306.8	35,075	42%~100%	48,680	40,012
45	13	29	0.79	1,315.8	35,337	42%~100%	49,004	38,728
46	14	30	0.76	1,327.6	35,661	42%~100%	49,419	37,555
47	15	31	0.73	1,341.9	36,038	42%~100%	49,928	36,482
48	16	32	0.70	1,358.9	36,474	42%~100%	50,523	35,497
49	17	33	0.68	1,377.7	36,949	42%~100%	51,172	34,570
50	18	34	0.65	1,397.5	37,442	42%~100%	51,860	33,673
51	19	35	0.62	1,419.3	37,992	42%~100%	52,617	32,850
52	20	36	0.60	1,211.7	30,394	42%~100%	45,245	27,158
53	21	37	0.58	787.1	31,007	42%~100%	29,128	16,806
54	22	38	0.56	803.7	31,633	42%~100%	29,678	16,463
55	23	39	0.53	819.3	32,218	42%~100%	30,188	16,101
56	24	40	0.51	177.2	5,985	42%~100%	4,161	2,120
57	25	41	0.49	182.9	6,177	42%~100%	4,294	2,104
58	26	42	0.47	147.2	4,808	42%~100%	3,537	1,679
59	27	43	0.46	152.4	4,976	42%~100%	3,661	1,671
60	28	44	0.44	125.3	3,888	42%~100%	3,276	1,438
61	29	45	0.42	131.4	4,071	42%~100%	3,436	1,450
62	30	46	0.41	89.4	2,709	42%~100%	2,127	863
63	31	47	0.39	93.9	2,845	42%~100%	2,234	872
64	32	48	0.38	85.4	2,484	42%~100%	1,838	690
65	33	49	0.36	90.7	2,638	42%~100%	1,952	704
66	34	50	0.35	96.8	2,815	42%~100%	2,083	722
67	35	51	0.33	0.0	0	42%~100%	0	0
68	36	52	0.32	0.0	0	42%~100%	0	0
69	37	53	0.31	0.0	0	42%~100%	0	0
70	38	54	0.30	0.0	0	42%~100%	0	0
71	39	55	0.29	0.0	0	42%~100%	0	0
72	40	56	0.27	0.0	0	42%~100%	0	0
合計(便益額)								2,422,086

1,246,488 千円

5 森林整備経費縮減等便益

(4) 森林整備促進便益

- ① 水源かん養便益
- イ 流域貯水便益

$$B = \sum_{t=1}^{T-1} \frac{t}{T \times (1+i)^t} + \sum_{t=T}^Y \frac{1}{(1+i)^t} \times \frac{(D2-D1) \times A \times P \times U \times 10}{365 \times 86400}$$

A:	事業対象区域面積 (ha)	0.00	~	1,419.31
P:	年間平均降雨量 (mm/年)	1,470	~	1,800
D1:	事業実施前の貯留率	0.51		
D2:	事業実施後、T年経過後の貯留率	0.56		
T:	事業実施後、貯留率が安定するのに必要な年数 (年)	10		
U:	開発水量当たりの利水ダム年間減価償却費 (円/m3/sec)	1,439,000,000		
Y:	評価期間 (年)	72		
10:	単位合わせのための調整値			
365:	1年間の日数			
86400:	1日の秒数			

便益算出表

(単位:千円)

評価期間	経過年	年度	割引係数 (1)	事業対象区域面積 (ha)	年効果額 (2)	効果発生割合 (3)	年発生効果額 (4)=(2)×(3)	現在価値 (5)=(4)×(1)
1	0	48	4.44	4.7	90	42%~100%	90	400
2	0	49	4.27	14.1	270	42%~100%	270	1,152
3	0	50	4.10	28.1	538	42%~100%	538	2,209
4	0	51	3.95	46.9	900	42%~100%	900	3,552
5	0	52	3.79	73.6	1,420	42%~100%	1,420	5,387
6	0	53	3.65	108.2	2,097	42%~100%	2,097	7,651
7	0	54	3.51	150.9	2,936	42%~100%	2,936	10,300
8	0	55	3.37	201.5	3,932	42%~100%	3,932	13,265
9	0	56	3.24	255.9	5,005	42%~100%	5,005	16,232
10	0	57	3.12	314.4	6,158	42%~100%	6,158	19,206
11	0	58	3.00	376.9	7,391	42%~100%	7,391	22,164
12	0	59	2.88	439.0	8,618	42%~100%	8,618	24,847
13	0	60	2.77	500.9	9,845	42%~100%	9,839	27,280
14	0	61	2.67	560.9	11,035	42%~100%	11,022	29,383
15	0	62	2.56	619.1	12,188	42%~100%	12,164	31,180
16	0	63	2.46	672.8	13,249	42%~100%	13,204	32,545
17	0	64	2.37	722.0	14,217	42%~100%	14,144	33,520
18	0	65	2.28	766.0	15,081	42%~100%	14,973	34,120
19	0	66	2.19	804.6	15,836	42%~100%	15,693	34,385
20	0	67	2.11	841.4	16,554	42%~100%	16,378	34,505
21	0	68	2.03	876.9	17,248	42%~100%	17,033	34,507
22	0	69	1.95	910.7	17,906	42%~100%	17,655	34,390
23	0	70	1.87	942.9	18,533	42%~100%	18,245	34,173
24	0	71	1.80	972.4	19,107	42%~100%	18,779	33,820
25	0	72	1.73	1,001.4	19,675	42%~100%	19,306	33,431
26	0	73	1.67	1,028.9	20,216	42%~100%	19,807	32,980
27	0	74	1.60	1,056.0	20,753	42%~100%	20,301	32,502
28	0	75	1.54	1,081.2	21,255	42%~100%	20,767	31,971
29	0	76	1.48	1,105.3	21,735	42%~100%	21,216	31,404
30	0	77	1.42	1,128.4	22,196	42%~100%	21,643	30,804
31	0	78	1.37	1,150.1	22,631	42%~100%	22,046	30,172
32	0	79	1.32	1,171.0	23,049	42%~100%	22,431	29,518
33	1	80	1.27	1,191.1	23,453	42%~100%	22,801	28,850
34	2	81	1.22	1,208.8	23,811	42%~100%	23,127	28,138
35	3	82	1.17	1,225.2	24,141	42%~100%	23,430	27,409
36	4	83	1.12	1,240.2	24,444	42%~100%	23,709	26,669
37	5	84	1.08	1,253.1	24,704	42%~100%	23,953	25,907
38	6	85	1.04	1,265.1	24,947	42%~100%	24,183	25,150
39	7	86	1.00	1,275.0	25,145	42%~100%	24,375	24,375
40	8	87	0.96	1,283.4	25,314	42%~100%	24,538	23,594
41	9	88	0.92	1,290.5	25,458	42%~100%	24,677	22,816
42	10	89	0.89	1,296.1	25,570	42%~100%	24,786	22,035
43	11	90	0.85	1,300.7	25,664	42%~100%	24,877	21,265
44	12	91	0.82	1,306.8	25,786	42%~100%	24,994	20,543
45	13	92	0.79	1,315.8	25,969	42%~100%	25,165	19,888
46	14	93	0.76	1,327.6	26,207	42%~100%	25,385	19,291
47	15	94	0.73	1,341.9	26,498	42%~100%	25,657	18,747
48	16	95	0.70	1,358.9	26,843	42%~100%	25,975	18,250
49	17	96	0.68	1,377.7	27,222	42%~100%	26,324	17,783
50	18	97	0.65	1,397.5	27,625	42%~100%	26,694	17,332
51	19	98	0.62	1,419.3	28,070	42%~100%	27,100	16,919
52	20	99	0.60	1,211.7	24,674	42%~100%	23,666	14,205
53	21	100	0.58	787.1	15,955	42%~100%	14,900	8,596
54	22	101	0.56	803.7	16,296	42%~100%	15,195	8,429
55	23	102	0.53	819.3	16,615	42%~100%	15,470	8,251
56	24	103	0.51	177.2	3,553	42%~100%	2,500	1,275
57	25	104	0.49	182.9	3,669	42%~100%	2,582	1,266
58	26	105	0.47	147.2	2,937	42%~100%	2,180	1,035
59	27	106	0.46	152.4	3,043	42%~100%	2,260	1,031
60	28	107	0.44	125.3	2,488	42%~100%	2,075	911
61	29	108	0.42	131.4	2,614	42%~100%	2,184	921
62	30	109	0.41	89.4	1,836	42%~100%	1,425	578
63	31	110	0.39	93.9	1,928	42%~100%	1,497	584
64	32	111	0.38	85.4	1,754	42%~100%	1,298	487
65	33	112	0.36	90.7	1,862	42%~100%	1,378	497
66	34	113	0.35	96.8	1,987	42%~100%	1,470	510
67	35	114	0.33	0.0	0	42%~100%	0	0
68	36	115	0.32	0.0	0	42%~100%	0	0
69	37	116	0.31	0.0	0	42%~100%	0	0
70	38	117	0.30	0.0	0	42%~100%	0	0
71	39	118	0.29	0.0	0	42%~100%	0	0
72	40	119	0.27	0.0	0	42%~100%	0	0
合計(便益額)								1,246,488

2,122,552 千円

5 森林整備経費縮減等便益
 (4) 森林整備促進便益
 ① 水源かん養便益
 ② 水質浄化便益

$$B = \sum_{t=1}^{T-1} \frac{t}{T \times (1+i)^t} + \sum_{t=T}^Y \frac{1}{(1+i)^t} \times (D2-D1) \times A \times P \times u \times 10$$

$$u = \frac{Ux \times Qx + Uy \times Qy}{Qx + Qy}$$

Qx:	全貯留量のうち生活用水使用相当量 (m3)	157 億
Qy:	全貯留量 - Qx (m3)	1,705.30 億
A:	事業対象区域面積 (ha)	0.00 ~ 1,419.31
P:	年間平均降雨量 (mm/年)	1,470 ~ 1,800
T:	事業実施後、貯留率が安定するのに必要な年数 (年)	10
D1:	事業実施前の貯留率	0.51
D2:	事業実施後、T年経過後の貯留率	0.56
Ux:	単位当たりの上水道給水原価 (円/m3)	177.45
Uy:	単位当たりの雨水浄化費 (円/m3)	68.60
u:	単位当たりの水質浄化費 (Ux と Uy を用いて Qx と Qy で比例按分して算出) (円/m3)	77.70
Y:	評価期間 (年)	72
10:	単位合わせのための調整値	

(単位:千円)

評価期間	経過年	年度	割引係数 ①	事業対象区域面積 (ha)	年効果額 ②	効果発生割合 ③	年発生効果額 ④=(②×③)	現在価値 ⑤=(④×①)
1	0	48	4.44	4.7	153	42%~100%	153	681
2	0	49	4.27	14.1	480	42%~100%	480	1,962
3	0	50	4.10	28.1	916	42%~100%	916	3,761
4	0	51	3.95	46.9	1,533	42%~100%	1,533	6,048
5	0	52	3.79	73.6	2,417	42%~100%	2,417	9,173
6	0	53	3.65	108.2	3,571	42%~100%	3,571	13,028
7	0	54	3.51	150.9	5,000	42%~100%	5,000	17,539
8	0	55	3.37	201.5	6,696	42%~100%	6,696	22,588
9	0	56	3.24	255.9	8,522	42%~100%	8,522	27,640
10	0	57	3.12	314.4	10,487	42%~100%	10,487	32,704
11	0	58	3.00	376.9	12,586	42%~100%	12,586	37,741
12	0	59	2.88	439.0	14,675	42%~100%	14,674	42,309
13	0	60	2.77	500.9	16,764	42%~100%	16,755	46,452
14	0	61	2.67	560.9	18,790	42%~100%	18,769	50,034
15	0	62	2.56	619.1	20,754	42%~100%	20,713	53,094
16	0	63	2.46	672.8	22,560	42%~100%	22,485	55,418
17	0	1	2.37	722.0	24,210	42%~100%	24,085	57,078
18	0	2	2.28	766.0	25,680	42%~100%	25,496	58,100
19	0	3	2.19	804.6	26,965	42%~100%	26,722	58,552
20	0	4	2.11	841.4	28,189	42%~100%	27,888	58,756
21	0	5	2.03	876.9	29,370	42%~100%	29,005	58,759
22	0	6	1.95	910.7	30,491	42%~100%	30,064	58,561
23	0	7	1.87	942.9	31,558	42%~100%	31,068	58,190
24	0	8	1.80	972.4	32,535	42%~100%	31,977	57,589
25	0	9	1.73	1,001.4	33,503	42%~100%	32,874	56,927
26	0	10	1.67	1,028.9	34,425	42%~100%	33,728	56,159
27	0	11	1.60	1,056.0	35,339	42%~100%	34,569	55,345
28	0	12	1.54	1,081.2	36,193	42%~100%	35,363	54,440
29	0	13	1.48	1,105.3	37,011	42%~100%	36,126	53,476
30	0	14	1.42	1,128.4	37,796	42%~100%	36,853	52,454
31	0	15	1.37	1,150.1	38,537	42%~100%	37,541	51,378
32	0	16	1.32	1,171.0	39,249	42%~100%	38,196	50,264
33	1	17	1.27	1,191.1	39,936	42%~100%	38,826	49,127
34	2	18	1.22	1,208.8	40,547	42%~100%	39,382	47,914
35	3	19	1.17	1,225.2	41,108	42%~100%	39,897	46,674
36	4	20	1.12	1,240.2	41,624	42%~100%	40,372	45,412
37	5	21	1.08	1,253.1	42,066	42%~100%	40,788	44,116
38	6	22	1.04	1,265.1	42,481	42%~100%	41,180	42,827
39	7	23	1.00	1,275.0	42,818	42%~100%	41,506	41,506
40	8	24	0.96	1,283.4	43,106	42%~100%	41,784	40,177
41	9	25	0.92	1,290.5	43,351	42%~100%	42,021	38,851
42	10	26	0.89	1,296.1	43,542	42%~100%	42,207	37,522
43	11	27	0.85	1,300.7	43,701	42%~100%	42,361	36,210
44	12	28	0.82	1,306.8	43,909	42%~100%	42,561	34,982
45	13	29	0.79	1,315.8	44,220	42%~100%	42,851	33,866
46	14	30	0.76	1,327.6	44,625	42%~100%	43,227	32,849
47	15	31	0.73	1,341.9	45,122	42%~100%	43,689	31,923
48	16	32	0.70	1,358.9	45,708	42%~100%	44,231	31,076
49	17	33	0.68	1,377.7	46,355	42%~100%	44,824	30,282
50	18	34	0.65	1,397.5	47,040	42%~100%	45,454	29,513
51	19	35	0.62	1,419.3	47,798	42%~100%	46,147	28,810
52	20	36	0.60	1,211.7	42,016	42%~100%	40,298	24,189
53	21	37	0.58	787.1	27,169	42%~100%	25,371	14,637
54	22	38	0.56	803.7	27,749	42%~100%	25,874	14,352
55	23	39	0.53	819.3	28,292	42%~100%	26,342	14,049
56	24	40	0.51	177.2	6,049	42%~100%	4,257	2,171
57	25	41	0.49	182.9	6,248	42%~100%	4,397	2,155
58	26	42	0.47	147.2	5,001	42%~100%	3,712	1,762
59	27	43	0.46	152.4	5,182	42%~100%	3,848	1,756
60	28	44	0.44	125.3	4,237	42%~100%	3,533	1,551
61	29	45	0.42	131.4	4,451	42%~100%	3,719	1,569
62	30	46	0.41	89.4	3,126	42%~100%	2,427	985
63	31	47	0.39	93.9	3,284	42%~100%	2,549	994
64	32	48	0.38	85.4	2,986	42%~100%	2,210	829
65	33	49	0.36	90.7	3,170	42%~100%	2,346	846
66	34	50	0.35	96.8	3,383	42%~100%	2,503	866
67	35	51	0.33	0.0	0	42%~100%	0	0
68	36	52	0.32	0.0	0	42%~100%	0	0
69	37	53	0.31	0.0	0	42%~100%	0	0
70	38	54	0.30	0.0	0	42%~100%	0	0
71	39	55	0.29	0.0	0	42%~100%	0	0
72	40	56	0.27	0.0	0	42%~100%	0	0
合計(便益額)								2,122,552

4,019,912 千円

- 5 森林整備経費縮減等便益
- (4) 森林整備促進便益
- ⑤ 環境保全便益
- ア 炭素固定便益
- イ 樹木固定分

$$B = \sum_{t=1}^Y \frac{V2-V1}{Y \times (1+i)^t} \times D \times BEF \times (1+R) \times 0.5 \times \frac{44}{12} \times U$$

U:	二酸化炭素に関する原単位(円/t-CO2)	6.046
V1:	事業を実施しない場合の評価最終年の当該森林の見込蓄積量(m3)	1,045 ~ 167,814
V2:	事業を実施する場合の評価最終年の当該森林の見込蓄積量(m3)	1,901 ~ 312,293
Y:	評価期間(年)	72
D:	容積密度(t/m ³)	0.361
BEF:	バイオマス拡大係数(地上部バイオマス量/幹バイオマス量)	スギ・ヒノキ(樹齢20上) 1.24
R:	地上部に対する地下部の比率(地下部バイオマス量/地上部バイオマス量)	スギ・ヒノキ(樹齢20上) 0.26

0.5: 植物中の炭素含有率

44/12: 炭素から二酸化炭素への換算係数

便益算出表							(単位:千円)	
評価期間	経過年	年度	割引係数 ①	V2-V1(m3) 樹種名(スギ・ヒノキ)	年効果額 ②	効果発生割合 ③	年発生効果額 ④=②×③	現在価値 ⑤=④×①
1	0	48	4.44	3,842.3	24,799	42%~100%	24,799	110,078
2	0	49	4.27	3,842.3	24,799	42%~100%	24,799	105,844
3	0	50	4.10	3,842.3	24,799	42%~100%	24,799	101,773
4	0	51	3.95	3,842.3	24,799	42%~100%	24,799	97,859
5	0	52	3.79	3,859.1	26,240	42%~100%	26,240	94,156
6	0	53	3.65	3,859.1	26,240	42%~100%	26,240	90,735
7	0	54	3.51	3,859.1	26,240	42%~100%	26,240	87,553
8	0	55	3.37	3,859.1	26,240	42%~100%	26,240	84,513
9	0	56	3.24	3,859.1	26,470	42%~100%	26,470	81,611
10	0	57	3.12	3,859.1	26,470	42%~100%	26,470	78,849
11	0	58	3.00	3,859.1	26,470	42%~100%	26,470	76,314
12	0	59	2.88	4,488.2	30,365	42%~100%	29,508	85,083
13	0	60	2.77	5,437.4	36,244	42%~100%	32,859	91,100
14	0	61	2.67	5,437.4	37,117	42%~100%	33,599	89,569
15	0	62	2.56	5,437.4	37,117	42%~100%	33,599	86,124
16	0	63	2.46	7,290.0	49,043	42%~100%	39,387	97,078
17	0	1	2.37	7,290.0	49,043	42%~100%	39,387	93,344
18	0	2	2.28	7,440.2	49,166	42%~100%	39,531	90,081
19	0	3	2.19	7,440.2	50,171	42%~100%	40,433	88,594
20	0	4	2.11	7,440.2	50,171	42%~100%	40,433	85,186
21	0	5	2.03	7,569.9	50,974	42%~100%	41,236	83,537
22	0	6	1.95	7,569.9	50,974	42%~100%	41,236	80,324
23	0	7	1.87	9,659.6	64,293	42%~100%	51,093	95,696
24	0	8	1.80	9,659.6	63,241	42%~100%	50,122	90,266
25	0	9	1.73	9,659.6	63,241	42%~100%	50,122	86,794
26	0	10	1.67	9,659.6	63,241	42%~100%	50,122	83,456
27	0	11	1.60	9,659.6	63,241	42%~100%	50,122	80,246
28	0	12	1.54	9,659.6	63,241	42%~100%	50,122	77,160
29	0	13	1.48	9,659.6	64,275	42%~100%	51,066	75,590
30	0	14	1.42	9,659.6	64,275	42%~100%	51,066	72,683
31	0	15	1.37	9,659.6	64,275	42%~100%	51,066	69,887
32	0	16	1.32	9,659.6	64,275	42%~100%	51,066	67,199
33	1	17	1.27	9,659.6	64,275	42%~100%	51,066	64,615
34	2	18	1.22	9,659.6	64,275	42%~100%	51,066	62,130
35	3	19	1.17	9,659.6	64,275	42%~100%	51,066	59,740
36	4	20	1.12	9,659.6	64,275	42%~100%	51,066	57,442
37	5	21	1.08	9,659.6	64,275	42%~100%	51,066	55,233
38	6	22	1.04	9,659.6	64,275	42%~100%	51,066	53,109
39	7	23	1.00	9,659.6	69,805	42%~100%	56,191	56,191
40	8	24	0.96	9,659.6	69,805	42%~100%	56,191	54,030
41	9	25	0.92	9,659.6	69,805	42%~100%	56,191	51,952
42	10	26	0.89	9,659.6	69,805	42%~100%	56,191	49,954
43	11	27	0.85	9,659.6	69,805	42%~100%	56,191	48,032
44	12	28	0.82	9,659.6	74,450	42%~100%	59,470	48,880
45	13	29	0.79	9,659.6	74,450	42%~100%	59,470	47,000
46	14	30	0.76	9,659.6	74,450	42%~100%	59,470	45,192
47	15	31	0.73	9,659.6	74,450	42%~100%	59,470	43,454
48	16	32	0.70	9,659.6	74,450	42%~100%	59,470	41,783
49	17	33	0.68	9,659.6	76,463	42%~100%	60,758	41,046
50	18	34	0.65	9,659.6	76,463	42%~100%	60,758	39,353
51	19	35	0.62	9,659.6	76,463	42%~100%	60,758	37,839
52	20	36	0.60	8,595.7	68,512	42%~100%	52,807	31,608
53	21	37	0.58	8,517.3	46,901	42%~100%	31,196	17,913
54	22	38	0.56	8,517.3	62,136	42%~100%	45,571	25,215
55	23	39	0.53	8,517.3	62,136	42%~100%	45,571	24,245
56	24	40	0.51	5,171.5	51,039	42%~100%	36,835	18,828
57	25	41	0.49	5,171.5	51,039	42%~100%	36,835	18,104
58	26	42	0.47	4,222.3	43,730	42%~100%	32,869	15,506
59	27	43	0.46	4,222.3	34,614	42%~100%	21,969	10,027
60	28	44	0.44	2,631.8	21,445	42%~100%	16,438	7,214
61	29	45	0.42	2,631.8	21,445	42%~100%	16,438	6,936
62	30	46	0.41	2,219.5	19,820	42%~100%	15,043	6,103
63	31	47	0.39	2,219.5	19,820	42%~100%	15,043	5,869
64	32	48	0.38	2,089.8	25,489	42%~100%	18,862	7,075
65	33	49	0.36	2,089.8	25,489	42%~100%	18,862	6,803
66	34	50	0.35	2,089.8	25,489	42%~100%	18,862	6,542
67	35	51	0.33	2,089.8	25,489	42%~100%	18,862	6,290
68	36	52	0.32	2,089.8	25,489	42%~100%	18,862	6,048
69	37	53	0.31	2,089.8	39,962	42%~100%	29,572	9,118
70	38	54	0.30	2,089.8	39,962	42%~100%	29,572	8,767
71	39	55	0.29	2,089.8	39,962	42%~100%	29,572	8,430
72	40	56	0.27	2,089.8	39,962	42%~100%	29,572	8,105
合計(便益額)								4,019,912

5 森林整備経費縮減等便益
 (4) 森林整備促進便益
 ③ 環境保全便益
 ア 炭素固定便益
 ii 森林土壌蓄積分

$$Bd-1 = \sum_{t=1}^Y \frac{1}{(1+i)^t} \times (C1-C2) \times A \times 0.3 \times \frac{44}{12} \times U$$

$$C1 = \frac{s \times e1}{30} \quad C2 = \frac{s \times e2}{30}$$

U:	二酸化炭素に関する原単位(円/t-CO2)	6.046
C1:	事業を実施しない場合の年間流出土砂量に含まれる炭素量(t-C/ha)	0.710
C2:	事業を実施した場合の年間流出土砂量に含まれる炭素量(t-C/ha)	0.046
Y:	①浸食深が30cmに達するまでの年数(T) 又は ②評価期間内に浸食深が30cmに達しない場合は評価期間(年)	43 ~ 52
A:	事業対象区域面積(ha)	0.00 ~ 1,419.31
s:	単位面積あたりの土壌平均炭素蓄積量(t-C/h)	106.540
44/12:	炭素から二酸化炭素への換算係数	
e1:	事業を実施しない場合の侵食深(cm/年)	0.200
e2:	事業を実施した場合の侵食深(cm/年)	0.013
30:	土壌炭素の測定深度(cm)	
0.3:	流出土壌排出炭素係数	

便益算出表

(単位:千円)

評価期間	経過年	年度	割引係数 ①	事業対象区域面積(ha)	年効果額 ②	効果発生割合 ③	年発生効果額 ④=②×③	現在価値 ⑤=④×①
1	0	48	4.44	4.7	21	42%~100%	21	92
2	0	49	4.27	14.1	62	42%~100%	62	266
3	0	50	4.10	28.1	124	42%~100%	124	509
4	0	51	3.95	46.9	207	42%~100%	207	817
5	0	52	3.79	73.6	325	42%~100%	325	1,233
6	0	53	3.65	108.2	478	42%~100%	478	1,743
7	0	54	3.51	150.9	666	42%~100%	666	2,338
8	0	55	3.37	201.5	890	42%~100%	890	3,002
9	0	56	3.24	255.9	1,130	42%~100%	1,130	3,666
10	0	57	3.12	314.4	1,389	42%~100%	1,389	4,331
11	0	58	3.00	376.9	1,665	42%~100%	1,665	4,992
12	0	59	2.88	439.0	1,938	42%~100%	1,938	5,589
13	0	60	2.77	500.9	2,211	42%~100%	2,210	6,127
14	0	61	2.67	560.9	2,474	42%~100%	2,472	6,590
15	0	62	2.56	619.1	2,729	42%~100%	2,724	6,984
16	0	63	2.46	672.8	2,961	42%~100%	2,954	7,280
17	0	1	2.37	722.0	3,172	42%~100%	3,160	7,490
18	0	2	2.28	766.0	3,358	42%~100%	3,342	7,616
19	0	3	2.19	804.6	3,521	42%~100%	3,500	7,669
20	0	4	2.11	841.4	3,675	42%~100%	3,650	7,689
21	0	5	2.03	876.9	3,824	42%~100%	3,793	7,684
22	0	6	1.95	910.7	3,964	42%~100%	3,929	7,654
23	0	7	1.87	942.9	4,098	42%~100%	4,058	7,601
24	0	8	1.80	972.4	4,219	42%~100%	4,174	7,517
25	0	9	1.73	1,001.4	4,338	42%~100%	4,288	7,425
26	0	10	1.67	1,028.9	4,451	42%~100%	4,395	7,318
27	0	11	1.60	1,056.0	4,561	42%~100%	4,500	7,205
28	0	12	1.54	1,081.2	4,665	42%~100%	4,600	7,081
29	0	13	1.48	1,105.3	4,764	42%~100%	4,695	6,949
30	0	14	1.42	1,128.4	4,859	42%~100%	4,785	6,810
31	0	15	1.37	1,150.1	4,948	42%~100%	4,870	6,664
32	0	16	1.32	1,171.0	5,033	42%~100%	4,950	6,514
33	1	17	1.27	1,191.1	5,114	42%~100%	5,026	6,360
34	2	18	1.22	1,208.8	5,186	42%~100%	5,093	6,197
35	3	19	1.17	1,225.2	5,252	42%~100%	5,155	6,031
36	4	20	1.12	1,240.2	5,313	42%~100%	5,213	5,864
37	5	21	1.08	1,253.1	5,366	42%~100%	5,264	5,694
38	6	22	1.04	1,265.1	5,417	42%~100%	5,312	5,525
39	7	23	1.00	1,275.0	5,459	42%~100%	5,353	5,353
40	8	24	0.96	1,283.4	5,494	42%~100%	5,388	5,181
41	9	25	0.92	1,290.5	5,525	42%~100%	5,418	5,009
42	10	26	0.89	1,296.1	5,549	42%~100%	5,441	4,837
43	11	27	0.85	1,300.7	5,569	42%~100%	5,460	4,667
44	12	28	0.82	1,306.8	5,594	42%~100%	5,485	4,508
45	13	29	0.79	1,315.8	5,631	42%~100%	5,520	4,363
46	14	30	0.76	1,327.6	5,679	42%~100%	5,566	4,230
47	15	31	0.73	1,341.9	5,739	42%~100%	5,623	4,108
48	16	32	0.70	1,358.9	5,808	42%~100%	5,689	3,997
49	17	33	0.68	1,377.7	5,884	42%~100%	5,760	3,891
50	18	34	0.65	1,397.5	5,964	42%~100%	5,836	3,790
51	19	35	0.62	1,419.3	6,053	42%~100%	5,920	3,697
52	20	36	0.60	1,211.7	5,127	42%~100%	4,989	2,996
53	21	37	0.58	787.1	3,242	42%~100%	3,098	1,788
54	22	38	0.56	803.7	3,305	42%~100%	3,156	1,751
55	23	39	0.53	819.3	3,365	42%~100%	3,209	1,712
56	24	40	0.51	177.2	554	42%~100%	420	215
57	25	41	0.49	182.9	572	42%~100%	434	213
58	26	42	0.47	147.2	485	42%~100%	387	184
59	27	43	0.46	152.4	503	42%~100%	401	183
60	28	44	0.44	125.3	463	42%~100%	394	173
61	29	45	0.42	131.4	486	42%~100%	415	175
62	30	46	0.41	89.4	307	42%~100%	241	98
63	31	47	0.39	93.9	322	42%~100%	253	99
64	32	48	0.38	85.4	279	42%~100%	207	77
65	33	49	0.36	90.7	296	42%~100%	219	79
66	34	50	0.35	96.8	318	42%~100%	234	81
67	35	51	0.33	0.0	0	42%~100%	0	0
68	36	52	0.32	0.0	0	42%~100%	0	0
69	37	53	0.31	0.0	0	42%~100%	0	0
70	38	54	0.30	0.0	0	42%~100%	0	0
71	39	55	0.29	0.0	0	42%~100%	0	0
72	40	56	0.27	0.0	0	42%~100%	0	0
合計(便益額)								275,572

9 維持管理費縮減便益

957,473 千円

$$B = \sum_{t=1}^Y \frac{(C_o - C_t) \times L_t}{(1 + i)^t}$$

Y:	評価期間(年)	72
Co:	林道舗装等を実施しない場合の維持管理費(円/m・年)	1,519 ~ 1,625
Ct:	林道舗装等を実施した場合の維持管理費(円/m・年)	71 ~ 74
Lt:	維持管理経費の縮減の対象となる林道の延長(m)	720 ~ 9,626

便益算出表

(単位:千円)

評価期間	経過年	年度	割引係数 ①	林道の延長	年効果額 ②	効果発生割合 ③	年発生効果額 ④=②×③	現在価値 ⑤=④×①
1	0	48	4.44		0		0	0
2	0	49	4.27		0		0	0
3	0	50	4.10		0		0	0
4	0	51	3.95		0		0	0
5	0	52	3.79		0		0	0
6	0	53	3.65		0		0	0
7	0	54	3.51		0		0	0
8	0	55	3.37		0		0	0
9	0	56	3.24		0		0	0
10	0	57	3.12		0		0	0
11	0	58	3.00		0		0	0
12	0	59	2.88		0		0	0
13	0	60	2.77		0		0	0
14	0	61	2.67		0		0	0
15	0	62	2.56		0		0	0
16	0	63	2.46	720~9.626	1,300	100%	1,300	3,204
17	0	1	2.37	720~9.626	1,300	100%	1,300	3,081
18	0	2	2.28	720~9.626	4,297	100%	4,297	9,793
19	0	3	2.19	720~9.626	4,297	100%	4,297	9,416
20	0	4	2.11	720~9.626	8,111	100%	8,111	17,090
21	0	5	2.03	720~9.626	8,111	100%	8,111	16,432
22	0	6	1.95	720~9.626	9,228	100%	9,228	17,975
23	0	7	1.87	720~9.626	9,228	100%	9,228	17,284
24	0	8	1.80	720~9.626	9,228	100%	9,228	16,619
25	0	9	1.73	720~9.626	9,228	100%	9,228	15,980
26	0	10	1.67	720~9.626	9,228	100%	9,228	15,365
27	0	11	1.60	720~9.626	23,166	100%	23,166	37,090
28	0	12	1.54	720~9.626	23,166	100%	23,166	35,663
29	0	13	1.48	720~9.626	23,166	100%	23,166	34,292
30	0	14	1.42	720~9.626	23,166	100%	23,166	32,973
31	0	15	1.37	720~9.626	23,166	100%	23,166	31,705
32	0	16	1.32	720~9.626	23,166	100%	23,166	30,485
33	1	17	1.27	720~9.626	26,311	100%	26,311	33,292
34	2	18	1.22	720~9.626	26,311	100%	26,311	32,011
35	3	19	1.17	720~9.626	26,311	100%	26,311	30,780
36	4	20	1.12	720~9.626	26,311	100%	26,311	29,596
37	5	21	1.08	720~9.626	26,311	100%	26,311	28,458
38	6	22	1.04	720~9.626	26,311	100%	26,311	27,364
39	7	23	1.00	720~9.626	26,311	100%	26,311	26,311
40	8	24	0.96	720~9.626	26,311	100%	26,311	25,299
41	9	25	0.92	720~9.626	26,311	100%	26,311	24,326
42	10	26	0.89	720~9.626	26,311	100%	26,311	23,390
43	11	27	0.85	720~9.626	26,311	100%	26,311	22,491
44	12	28	0.82	720~9.626	26,311	100%	26,311	21,626
45	13	29	0.79	720~9.626	26,311	100%	26,311	20,794
46	14	30	0.76	720~9.626	26,311	100%	26,311	19,994
47	15	31	0.73	720~9.626	26,311	100%	26,311	19,225
48	16	32	0.70	720~9.626	26,311	100%	26,311	18,486
49	17	33	0.68	720~9.626	26,311	100%	26,311	17,775
50	18	34	0.65	720~9.626	26,311	100%	26,311	17,016
51	19	35	0.62	720~9.626	26,311	100%	26,311	16,362
52	20	36	0.60	720~9.626	26,311	100%	26,311	15,733
53	21	37	0.58	720~9.626	26,311	100%	26,311	15,127
54	22	38	0.56	720~9.626	26,311	100%	26,311	14,546
55	23	39	0.53	720~9.626	26,311	100%	26,311	13,986
56	24	40	0.51	720~9.626	25,011	100%	25,011	12,781
57	25	41	0.49	720~9.626	25,011	100%	25,011	12,289
58	26	42	0.47	720~9.626	22,014	100%	22,014	10,449
59	27	43	0.46	720~9.626	22,014	100%	22,014	10,047
60	28	44	0.44	720~9.626	18,200	100%	18,200	7,987
61	29	45	0.42	720~9.626	18,200	100%	18,200	7,679
62	30	46	0.41	720~9.626	17,083	100%	17,083	6,931
63	31	47	0.39	720~9.626	17,083	100%	17,083	6,665
64	32	48	0.38	720~9.626	17,083	100%	17,083	6,408
65	33	49	0.36	720~9.626	17,083	100%	17,083	6,162
66	34	50	0.35	720~9.626	17,083	100%	17,083	5,925
67	35	51	0.33	720~9.626	3,145	100%	3,145	1,049
68	36	52	0.32	720~9.626	3,145	100%	3,145	1,008
69	37	53	0.31	720~9.626	3,145	100%	3,145	970
70	38	54	0.30	720~9.626	3,145	100%	3,145	932
71	39	55	0.29	720~9.626	3,145	100%	3,145	896
72	40	56	0.27	720~9.626	3,145	100%	3,145	862
合計(便益額)								957,473