

	OA	OB	OA	OB		
Surface	1,700	200	160	340,000	272,000	
Gate	10,000	1	1	10,000	10,000	
Fence	150	60	52	9,000	7,800	
Light	30,000	2	1	60,000	30,000	
Plastics	30,000	3	2	90,000	60,000	
Paper	25,000	3	2	75,000	50,000	
WEEE	9,000	1	1	9,000	9,000	
Shelter	80,000	1	1	80,000	80,000	
WC	25,000	1	1	25,000	25,000	
Subvention	-250,000	1	1	-250,000	-250,000	
Energies fix	5,000					1
Energies Liç	3,000					2
Maintenan	180					200
Personal cc	20,000					0.6
				<b>448,000</b>	<b>293,800</b>	
Plastics	1,900				240	170
Paper	1,200				240	170
WEEE	700				240	170
Tax corrections						
Waste ben	200					240
Negatives -	-10,000					3

	0	1	2	3	4	
A	-448,000	-239,960	-239,960	-239,960	-239,960	
		360,000	360,000	360,000	360,000	
0.04	-448,000	120,040	120,040	120,040	120,040	<b>-12,267</b>
0.05	-448,000	115,423	110,984	106,715	102,611	<b>-12,267</b>
		87,264	87,264	87,264	87,264	
	-448,000	207,304	207,304	207,304	207,304	<b>287,090</b>
	-448,000	197,432	188,031	179,077	170,550	<b>287,090</b>
B	-293,800	-165,440	-165,440	-165,440	-165,440	
		255,000	255,000	255,000	255,000	
	-293,800	89,560	89,560	89,560	89,560	<b>31,293</b>
	-293,800	86,115	82,803	79,619	76,556	<b>31,293</b>
		64,004	64,004	64,004	64,004	
	-293,800	153,564	153,564	153,564	153,564	<b>250,730</b>
	-293,800	146,251	139,287	132,654	126,337	<b>250,730</b>

5,000	5,000
6,000	3,000
36,000	28,800
192,960	128,640
<b>239,960</b>	<b>165,440</b>

228,000	161,500
115,200	81,600
16,800	11,900
<b>360,000</b>	<b>255,000</b>

69,264	50,004
48,000	34,000
-30,000	-20,000
<b>87,264</b>	<b>64,004</b>

-0.03

0.64

0.11

0.85

Project	Outputs	Total Costs	
A	11	230	20.9
B	16	240	15
C	8	150	18.8
D	10	200	20

Location	k1	k2	k3	k4	k5	k6		
A		79	86	2.2	31	4	160	
B		73	90	2	46	5	161	
Č		71	75	1.7	36	5	131	
CMA	A		2900	PV		300 CEA	36.71	33.72
	B		3020			200	41.37	33.56
	Č		2520			100	35.49	33.60

	0	1	2	3	4	5		
A	200	30	40	50	40	30	384.4	355.7
B	10	60	70	80	110	90	407.0	340.6
C	100	60	60	60	60	60	391.2	346.0

	population	frequency	waste	costs		
A	3000	52	7	550	1510.989	
B	3000	26	12	450	1442.308	
			1650000	1092	1510.989	
			1350000	936	1442.308	

	0 1-10					
A	1800	600	2400	1.8	1	3000
B	800	300	1100		1.4	2750
C	3900	100	4000		0.2	2500

A	7.2	0.64	4.608	80	17.361
B	4.9	0.79	3.871	65	16.792

0.03	0.4	0	1	2	3		
A		50	340	340	340	1011.73	102.19 per task
	15		3300	3300	3300		
	0.094		124.08	124.08	124.08		
total costs		50	464.08	464.08	464.08	1362.70	137.65 per task
B		50	400	400	400	1181.44	105.30 per task
	17		3740	3740	3740		

0.077		115.192	115.192	115.192		
total costs	50	515.192	515.192	515.192	1507.28	134.34 per task
C	50	470	470	470	1379.45	104.50 per task
20		4400	4400	4400		
0.071		124.96	124.96	124.96		
total costs	50	594.96	594.96	594.96	1732.91	131.28 per task

A	27	0.82	22.14	80000	20000	4000	10000	5149.051
B	36	0.61	21.96	80000	30000			5009.107
C	51	0.42	21.42	80000	30600			5163.399



for paper (each 6000 CZK), and 1 for Tetrapak (each 8000 Kč), biweekly collection, takes 5 hours per collection, for each collection we use 1.2 sack/each type of recyclables, municipality has 140 households, biweekly collection

tetrapak  
2000  
3  
4

on, takes on average 1.2 sack/collection/type of waste

	0	1	2	3	4	5	
B cost	-117,936	-173,160	-173,160	-173,160	-173,160	-173,160	
B benef	0	187,824	187,824	187,824	187,824	187,824	
B sum	-117,936	14,664	14,664	14,664	14,664	14,664	<b>NPV</b>
B disc	-117,936	14,100	13,558	13,036	12,535	12,053	<b>-52,654.5</b>
							<b>Ri= -0.44647</b>

	0	1	2	3	4	5	
B fa	-117,936	14,664	14,664	14,664	14,664	14,664	
B ecost	0	-47,320	-47,320	-47,320	-47,320	-47,320	
B ebenef	0	84,000	84,000	84,000	84,000	84,000	
B esum	-117,936	51,344	51,344	51,344	51,344	51,344	<b>NPV</b>
B edisc	-117,936	48,899	46,571	44,353	42,241	40,229	<b>104,356.7</b>
							<b>Ri= 0.884858</b>

lection

ollection, takes 9 hours per collection

Example 2

Project A – De-mudding and cultivation of a pond, construction of an outdoor swimming pool in one part of the pond free of charge. Second part of the pond will be used for fishing purposes (expected amount of revenue 1000 CZK per season)

Projekt B – De-mudding and cultivation of a pond that will be used for fishing purposes (expected amount of revenue 160.8 CZK per season)

Expected lifetime of the projects is 3 years

Costs and benefits

thousands CZK

AB	1500	Costs for de-mudding and cultivation – 1.5 mil. CZK
A	1000	Costs for building outdoor swimming pool – 1 mil. CZK
yA	160.8	Gross wages for 2 persons maintaining the swimming pool during the season – 160.8 CZK
AB	150	Costs for project documentation for cultivation – 150 000 CZK
yA	1200	Revenues from renting places for stands with ice-cream on the swimming pool – 1200 CZK
yA	150	Negative effects of the swimming pool on the surroundings – 150 000 CZK per season
yAB	0.2	Price for the fishing permit – 200 CZK/person
AB1	750	Subvention from the region for cultivation (received during the first year after the start of the project)

r= 8%

Simple CMA

	0	1	2	3	Total
A	2,650.0	160.8	160.8	160.8	<b>3,132.4</b>
B	1,650.0	0.0	0.0	0.0	<b>1,650.0</b>
A disc	2,650.0	148.9	137.9	127.6	<b>3,064.4</b>

CBA including financial and economic analysis, use appropriate criterion for deciding which project is better

financial analysis

	0	1	2	3		0	
A cost	-2,650.0	-160.8	-160.8	-160.8		B cost	-1,650.0
A benef	0.0	2,050.0	1,300.0	1,300.0		B benef	0.0
A sum	-2,650.0	1,889.2	1,139.2	1,139.2	<b>NPV</b>	B sum	-1,650.0
A disc	-2,650.0	1,749.3	976.7	904.3	<b>980.3</b>	B disc	-1,650.0
			<b>Ri=</b>	<b>0.369914</b>			
			<b>ROI=</b>	<b>1.572679</b>			

economic analysis

	0	1	2	3		0	
A fa	-2,650.0	1,889.2	1,139.2	1,139.2		B fa	-1,650.0
A ecost	0.0	-150.0	-150.0	-150.0		B ecost	0.0
A ebenef	0.0	58.8	58.8	58.8		B ebenef	0.0
A esum	-2,650.0	1,798.0	1,048.0	1,048.0	<b>NPV</b>	B esum	-1,650.0
A edisc	-2,650.0	1,664.8	898.5	831.9	<b>745.2</b>	B edisc	-1,650.0
			<b>Ri=</b>	<b>0.281223</b>			

ROI= **1.469434**

**CEA with E being acquired point from public poll, alternatively E being amount of sold fishing permits  
– project A acquired 88 points out of 100, project B 47 points out of 100**

points	costs	effects	CEA
A nondisc	3,132.4	88.0	<b>35.60</b>
A disc	3,064.4	88.0	<b>34.82</b>

points	costs	effects	CEA
B nondisc	1,650.0	47.0	<b>35.11</b>
B disc	1,650.0	47.0	<b>35.11</b>

permits	costs	effects	CEA
A nondisc	3,132.4	500.0	<b>6.26</b>
A disc	3,064.4	500.0	<b>6.13</b>

permits	costs	effects	CEA
B nondisc	1,650.0	2,000.0	<b>0.83</b>
B disc	1,650.0	2,000.0	<b>0.83</b>

rt (operating june-september)  
of sold fishing permits is 500)  
int of sold fishing permits is 2000)

5 000 CZK/person/month (net wage 12 750 CZK)

· 300 000 CZK/month  
season

ie realization), 50% of the costs

**better, comment why you have chosen that criterion**

	1	2	3	
	0	0	0	
	1,150.0	400.0	400.0	
	1,150.0	400.0	400.0	<b>NPV</b>
	1,064.8	342.9	317.5	<b>75.3</b>
		<b>Ri=</b>		<b>0.045626</b>
		<b>ROI=</b>		<b>1.181818</b>

	1	2	3	
	1,150.0	400.0	400.0	
	0.0	0.0	0.0	
	0.0	0.0	0.0	
	1,150.0	400.0	400.0	<b>NPV</b>
	1,064.8	342.9	317.5	<b>75.3</b>
		<b>Ri=</b>		<b>0.045626</b>

ROI=

1.181818