

**THIRD TOURISM DEVELOPMENT PROJECT  
SECONDARY CITIES REVITALIZATION STUDY**

**Jerash**

**Economic analysis**

**Annex 6**

**JOINT VENTURE OF COTECNO WITH ABT ALCHEMIA CDG MGA**

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## Abbreviations and acronyms

CAS	Country assistance strategy
CH	Cultural heritage
CBO	Community based organization
CRP	City Revitalization Program
DOS	Department of Statistics
EIA	Environmental Impact Assessment
GJM	Greater Jerash Municipality
GOJ	Government of Jordan
IBRD	International Bank for Reconstruction and Development
ITFCSD	Italian trust fund for culture and sustainable development
JTB	Jordan Tourist Board
MENA	Middle East and North Africa
MOE	Ministry of Environment
MOMA	Ministry of Municipal Affairs
MOPIC	Ministry of Planning and International Cooperation
MOTA	Ministry of Tourism and Antiquities
NEAP	National Environmental Action Plan
NGO	Non Government Organization
PA	Public Awareness
PPP	Public-private partnership
STDP	Second Tourism Development Project
TOR	Terms of reference
TTDP	Third Tourism Development Project
UNESCO	United Nations Educational, Scientific and Cultural Organization
URP	Urban regeneration program
VEC	Valued Environmental Components
WB	The World Bank
WHL	World heritage List
WTO	World Trade Organization

## 1. Introduction

The economic analysis of CRP proposal for Jerash has been developed from both a qualitative and a quantitative point of view.

For each of the envisaged program actions a general analysis has been conducted in terms of identification and qualitative analysis of the economic effects, without proceeding with their quantification in monetary terms, while a cost-benefit analysis has been realized in order to evaluate the cost-effectiveness of the whole Jerash CRP.

### 1.1 ACTIONS, FORESEEN INVESTMENTS COSTS, TIMING AND STARTING YEARS

The economic analysis has been developed according to the data reported in the following table regarding foreseen investment costs, duration and starting year of the works related to each of the envisaged actions.

ACTIONS	INVESTMENT COSTS (US\$)	TIMING	STARTING YEAR
J.01 Upgrading of the street network	2,678,802	38 months	1
J.02 The landscape restoration of the wadi area	2,201,040	27 months	2
J.03 The completion of the east Baths development	424,840	22 months	2
J.04 The reuse of the available open space pertaining to the ex-market place	2,577,181	24 months	2
Capacity building action	457,650	30 months	1

**TABLE 1 - ACTIONS, INVESTMENT COST, TIMING AND STARTING YEAR**

The first step of the economic analysis has been to define the distribution of costs over the time that is a fundamental issue for the elaboration of the project cost benefit analysis. Therefore, the project time sheet has been designed taking into account, on the one hand, the priority level of each action, and, on the other hand, the logical links among them.

The following table shows the time sheet regarding all actions of the CRP proposal for Jerash.

ACTIONS	YEARS				
	1	2	3	4	5
J.01 Upgrading of the street network	■	■	■	■	
J.02 The landscape restoration of the wadi area		■	■	■	
J.03 The completion of the east baths development		■	■		
J.04 The reuse of the available open space pertaining to the ex-market place			■	■	
Capacity building	■	■	■		

TABLE 2 – ACTIONS' TIME SHEET

## 1.2 DISTRIBUTIONAL EFFECTS

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From a merely economic point of view, the main beneficiaries of Jerash CRP will be the owners of the commercial and economic activities directly and indirectly related to the tourism industry, who will increase their businesses. Such increase will, in turn, result in additional job opportunities for Jerash's citizens, thus increasing the overall activity rate of the city and making individual and households' earnings grow. This will affect mainly youngsters and women, who currently represent the most disadvantaged groups in Jerash.

Regarding both formal and informal private existing activities that could be easily "upgraded" to provide tourism or culture related services works and products, opportunities could be found in the construction sector (skilled construction workers) that seems have been in growth during the last years. Development opportunities are also in the handicraft (formal and informal production) for the typical products of the city (such as traditional food, embroidery, wood carving, etc). Obviously to improve the more directly tourism related services (restaurants, guides, etc) represents a must that could enhance the customer satisfaction level of the Jerash visitors.

In general, the economic sector most directly affected during the realization phase will be, undoubtedly, that of construction, this will, in turn, strongly impact the small enterprises and craftsmen sectors, while during the management phase the most affected sectors will be the following:

- commercial (shops in the historic cores);
- handicraft (both as building-related and commerce-related);
- informal sector;
- public/municipal sector;
- tourism-related activities (restaurants, hotel, other accommodations, tourist guides, tourist transport);
- services related to all the above.

The expected outcomes of the Jerash CRP's implementation in the economic sectors potentially involved in the operational phase of the revitalization program will be in terms of improvements in the production performances resulting in both sectoral occupancy and value added increase.

## **2. Economic analysis**

### **2.1 GENERAL OVERVIEW OF THE FOUR PHYSICAL ACTIONS**

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#### **2.1.1 J.01 “UPGRADING OF THE STREET NETWORK”**

The interventions aimed at upgrading and improving the urban spaces will result in an increase of attractiveness of the whole city centre both for people from the city itself and from outside, who will visit the commercial streets in order to shop there. Such indirect economic benefits will be quantified in Chapter 3 of this Annex.

#### **2.1.2 J.02 “THE LANDSCAPE RESTORATION OF THE WADI AREA”**

The restoration of the Wadi area and its transformation in a public park will, as a first results, to enhance the livability and environmental conditions within the historic core. This will presumably generate an increase in the real estate values and in a general growth of incomes, even if it could be very difficult to precisely estimate the involved building volumes.

Moreover, the restoration of the Wadi area will visually underline the connection of the Old City to the archaeological site, contributing to integrate it within the city core, thus providing Jerash with a new symbolic focus, where to discover, valorise and preserve its history and cultural heritage. Furthermore, a stronger cultural awareness among Jerash's citizens could stimulate among them a pro-active attitude towards the revitalization of the city and its further valorization as tourist destination.

#### **2.1.3 J.03 “ THE EAST BATHS NODE”**

The completion of the recent East Baths Plaza Development project will have a very important impact on the revitalization of Jerash: it will provide the city with a physical way to connect the archaeological site to the Old City, thus widening the opportunities of interaction between the residents and the tourists, both in cultural and economic terms. In fact, even if the Roman Decapolis attracts large number of tourists, its impact on the overall economic system is still very limited, mainly because tourist groups only visit the archaeological site.

The completion of the East Baths Plaza will therefore result in a growth of the visitors' number to Jerash city and of their length of stay, thus increasing business volumes and value added generated by the tourist expenditures.

#### **2.1.4 J.04 “THE REUSE OF THE EX-MARKET PLACE FOR A NEW PARKING STRUCTURE”**

The realization of a furnished urban plaza, including hard landscape and pedestrian areas, can easily stimulate the development of this area into a new entertainment and socialization point for Jerash citizens, thus providing them with some of those cultural venues they wish to see realized. As a consequence, it is envisageable that the quality of life for Jerash residents will improve, contributing to prevent, on the one hand, the youth from leaving Jerash to entertain themselves, and, on the other hand, the city center from being emptied to the advantage of the new residential surrounding areas. This will finally result in an increase in the real estate appreciation and in the growth of the real estate sector.

Moreover, the creation of a three-level parking facility located in proximity of the urban core, will further strengthen the action of the street network upgrading, making Jerash far more pleasant to reach and visit, first of all, for the residents themselves, but also for both the commuters from surrounding villages and for the tourists that visit the city.

## 2.2 THE CAPACITY BUILDING ACTION

The capacity building action within Jerash Municipality has to be regarded to as an essential feature to guarantee the sustainability of the CRP envisaged benefits in the long period.

Indeed, as clearly emerged from the analysis carried out in Section 5 of Annex 1 "Detailed description of the CRP", in the present situation the Municipality currently misses the expertise required in order to correctly design, implement, manage, monitor and evaluate the actions foreseen by the CRP as a whole. Without proper training and capacity building interventions specifically addressed to the Public Administration officers, who will have after all the ultimate responsibility of the CRP implementation, the results achieved by the Program implementation will not be able to consolidate and, consequently, to fully activate the socio-economic benefits described above.

## 2.3 COST-BENEFIT ANALYSIS

### 2.3.1 INVESTMENT AND OPERATING COSTS

The reconstruction of investment and operating costs' breakdown over the years is the first step of the cost-benefit analysis.

Therefore, the following tables present both investment and operating costs of the whole Program. The operating costs considered in the analysis have been calculated on a forfeit base, according to the features of each action, and have been broken down over the first 10 years of project's activity (considering both construction and operation phases).

A) WORKS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
ROAD CONSTRUCTION	119,667	1,077,000	21,905	197,149		1,415,721
UTILITIES UPGRADING	32,519	292,674	2,414	21,722		349,329
SOUTH BRIDGE JUNCTION	16,937	152,434				169,372
TRAFFIC MANAGEMENT PLAN	3,529	31,757				35,286
HARD LANDSCAPE		9,527	19,054	161,962		190,543
SOFT LANDSCAPE		45,448	90,896	772,617		908,961
PUBLIC PIAZZA AND GARDEN		12,336	121,411	93,493		227,240
PARKING LOTS		720	6,478			7,198
SPECIAL STRUCUTRES AND FURNISHING		9,880	88,920			98,800
PARKING STRUCUTRE			179,110	1,611,994		1,791,105
<b>TOTAL COST OF THE WORKS</b>	<b>172,652</b>	<b>1,631,777</b>	<b>530,190</b>	<b>2,858,936</b>		<b>5,193,554</b>
<b>B) ADDITIONAL PROVISIONS</b>						
b1) TECHNICAL EXPENSES						
Detailed design consultancy ( 8% of A )	13,812	130,542	42,415	228,715		415,484
Construction supervision and management ( 8% of A )	13,812	130,542	42,415	228,715		415,484
Topographical & archaeological surveys/specialistic investigations ( 5% of A )	8,633	81,589	26,509	142,947		259,678
b2) CONTINGENCIES (15% of A)	25,898	244,767	79,528	428,840		779,033
<b>TOTAL COST OF THE ADDITIONAL PROVISION</b>	<b>62,155</b>	<b>587,440</b>	<b>190,868</b>	<b>1,029,217</b>		<b>1,869,680</b>



<b>C) PRIVATE BUILDINGS FACADE REHABILITATION</b>		3,529	7,057	59,986		70,572
<b>D) LAND ACQUISITION</b>		564,572				564,572
<b>E) BUILDINGS DEMOLITION</b>		70,572				70,572
<b>F) MARKET STALLS ACQUISITION</b>		98,800				98,800
<b>G) MARKET STALLS DEMOLITION</b>		14,114				14,114
<b>H) CAPACITY BUILDING</b>						
Recruitment of personnel	26,880	26,880	26,880	26,880	26,880	134,400
Training	13,500	6,750				20,250
Municipal Information System	10,000	20,000	10,000			40,000
Technical Assistance	20,000	20,000				40,000
In-kind Assistance	115,000				108,000	223,000
<b>TOTAL COST OF THE CAPACITY BUILDING</b>	<b>185,380</b>	<b>73,630</b>	<b>36,880</b>	<b>26,880</b>	<b>134,880</b>	<b>457,650</b>
<b>FINAL ACTION PROJECT COST (A+B+C+D+E+F+G+H)</b>	<b>420,186</b>	<b>3,044,433</b>	<b>764,995</b>	<b>3,975,019</b>	<b>134,880</b>	<b>8,339,513</b>

TABLE 3 – JERASH CRP - INVESTMENT COSTS (IN US\$)

As shown in the table, the investment costs of the Program amount to a total of 8.340 million US\$.

OPERATING COSTS										
Action	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
J.01					5,000	10,000	15,000	20,000	25,000	25,000
J.02					4,000	8,000	12,000	16,000	20,000	20,000
J.03				800	1,600	2,400	3,200	4,000	4,000	4,000
J.04					25,200	33,600	42,000	42,000	42,000	42,000
Capacity building						26,880	26,880	26,880	26,880	26,880
<b>Total</b>				<b>800</b>	<b>35,800</b>	<b>80,880</b>	<b>99,080</b>	<b>108,880</b>	<b>117,880</b>	<b>117,880</b>

TABLE 4 – JERASH CRP - OPERATING COSTS (IN US\$)

### 2.3.2 BENEFITS

As already mentioned above when describing the main economic effects of each Program action, the economic benefits generated by the implementation of the Jerash CRP can be quantified as follows:

- economic benefits related to the new parking stalls available in Jerash city;
- economic benefits related to the improvement of the quality of Jerash urban spaces through the rationalization and beautification of both the street and the landscape of the very historic core of the city, making it more attractive for walking and for shopping;
- economic benefits related to the increase of tourists' presence in Jerash due to the general improvement of its cultural facilities and supply.

The first class of benefits can be quantified in terms of time saved instead of looking for a car lot, thanks to the wider availability of car-parking spaces. In fact, the Project would provide for about 270 new car-parking stalls, that will be housed in the new three-level parking facility

that will be built exploiting the available open space pertaining to the ex-market place.

The hypotheses taken into account in order to estimate the benefits are:

- an average time saving of 10 minutes per car;
- an average occupancy rate of the car-parking places of 50%;
- an average stay duration of 2 hours in each parking place;
- 12 hours/day of utilization for each parking.

Based on the above parameters, the saved time will be of 49,275 hours per year.

According to the methodologies usually applied, the shadow value of time has been estimated as the GDP per capita per hour.

GDP/capita/year	1,288
GDP/capita/h	2.24

In the situation of normal operation, the economic benefits will amount to more than 110 thousand JD per year.

It is assumed that during the first 4 years of operation the parking utilization will progressively develop as follows:

- year 1: 40% of normal operation;
- year 2: 60% of normal operation;
- year 3: 80% of normal operation;
- year 4: 100% of normal operation.

The second class of generated economic benefits is related to the sales increase foreseeable for the shops located within the city core, due to the Project generated improvement in streetscape quality, which will make the whole area more attractive for shopping. Another effect of the project implementation will be the increase in the real estates values, but this second benefit category has not been quantified since it could be very difficult to precisely estimate the involved building volume.

The following table reports the main data on sector enterprises in Jerash.

Sector	No. of Estab- lishment	%	Employ- ment	%	Total Value Added	%	Total Gross Output	%	Total Sales (JD)	%
Manufacturing	343	12.7%	1,003	17.7%	1,669,888	17.4%	5,187,720	28.7%	5,187,720	9.4%
Trade	1,759	65%	3,514	62.6%	5,440,462	56.6%	8,153,437	45.1%	45,392,606	82.0%
Services	605	22.3%	1,097	19.5%	2,498,167	26.0%	4,724,119	26.1%	4,724,119	8.5%
Total	2,707	100%	5,614	100%	9,608,517	100%	18,065,276	100%	55,304,445	100%

**TABLE 5 - DATA ABOUT SECTOR ENTERPRISES IN JERASH BY 2002**

The hypothesis taken into account is that only the value added growth generated by the increasing of the shop sales has to be considered in the benefit estimation. It is reasonable to foresee a value added growth of 8% due to the projects implementation.

With this regard, it should be noticed that, in order to avoid duplications in the estimation of benefits, the value added increase has been determined without estimating the increase in expenditures for shopping generated from the increased number of visitors, consequent to the improvement of Jerash cultural supply. Those benefits are quantified below, through the evaluation in monetary terms of the effects of the CRP implementation on tourists' presence in Jerash.

Given the above, the economic benefits related to the growth in trade activities will amount to

582,649 JD per year.

As observed for the first class of benefits presented above, it is assumed that during the first 4 years of operation the value added will progressively increase as follows:

- year 1: 40% normal operation;
- year 2: 60% normal operation;
- year 3: 80% normal operation;
- year 4: 100% normal operation.

Finally, the economic benefits deriving from the increase of tourists' presence in Jerash have to be considered together with the ones already calculated. It can be assumed that the street and landscape beautification within the city core, together with the upgrading of urban spaces and, above all, the provision of new cultural assets and reuse of open space, will definitely contribute to increase the tourism attractiveness of Jerash. The increase in number of visitors could induce a more general increase in tourism revenues, deriving from the tourist additional expenditures. According to that, the indirect benefits of Jerash CRP can be quantified measuring the value added generated by the increase in tourists' expenditure.

Indeed, the implementation of the Program may have two effects on tourists: it will attract more visitors and/or will result in a longer stay of those tourists who would have come to Jerash in any case. The increase in number of visitors could induce a more general increase in tourism revenues, deriving from the tourist additional expenditures. This additional expenditure can be assumed equal to the present tourists' average daily expenditure multiplied by the additional number of tourists.

The overall additional number of tourists can be calculated starting from the number of visitors to Jerash city, assuming that the CRP implementation will attract a 10% more visitors with respect to the visitor flow of 2000 (the peak of the last years). It has been assumed that one third of those additional visitors will represent additional arrivals in Jordan and Jerash.

	1998	1999	2000	2001	2002	2003
USA and Canada	2,461	2,789	4,536	1,846	1,620	890
Europe	127,861	161,824	197,573	94,534	50,072	34,729
Asia	8,181	8,813	10,946	6,237	4,831	7,112
Australia & New Zealand	1,758	1,951	2,581	1,399	961	802
Arab Countries	4,780	6,101	7,819	9,877	10,124	10,922
Jordan	55,349	49,600	40,150	42,500	31,650	46,612
Israel	7,408	12,637	9,877	47	51	455
African Countries	330	263	611	118	156	179
<b>TOTAL</b>	<b>226,099</b>	<b>264,000</b>	<b>299,750</b>	<b>167,650</b>	<b>104,240</b>	<b>105,734</b>

**TABLE 6 - NUMBER OF VISITORS TO JERASH CITY BY NATIONALITY (1998-2003)**

In the following table, the comparison between the additional tourist arrivals and the inflows detected in 1999 and 2003 is presented. As compared to 1999, the estimation foresees an increase of 11%; to 2003, of 28%.

	COMPARED TO 1999	COMPARED TO 2003
3	3%	9%
4	5%	11%
5	6%	14%
6	7%	17%
7	9%	23%
8	11%	28%

The average daily expenditure of overseas tourists is of 140.9 JD per arrival, as shown in the following table.

	Tourists	Acco- moda- tion	Food and drinks	Health treat- ment	Study/u niversi- ties etc	Internal tranpor- tations	Recreat ion	Shop ping	Group tours	Other exp.	Total
Total	4,098,316	76,909	106,374	76,816	18,020	67,234	43,380	107,338	50,458	31,066	577,593
per arrival		18.766	25.955	18.743	4.397	16.405	10.585	26.191	12.312	7.580	140.934
value added		11.86	16.41	11.85	2.78	10.37	6.69	18.62	7.78	4.79	91.15

To convert expenditures in value added, gross output and gross value added of the main sectors (industry, service and trade) have been considered (see the table below).

	GROSS OUTPUT	GROSS VALUE ADDED	COEFFICIENT OF VALUE ADDED INDUCEMENT
Industrial sector	4,080,021	1,447,068	0.35
Service Sector: profit	740,979	468,401	0.63
Service Sector: non-profit	105,139	64,766	0.62
Service Sector: total	846,118	533,168	0.63
Trade	774,732	550,749	0.71

TABLE 7 - TOTAL VALUE ADDED OF INDUSTRIAL SECTOR FOR 2002- NATIONAL LEVEL (JD 000)

Economic benefits, in the situation of normal operation will be of 910,766 JD per year.

It is assumed that during the first 5 years of operation the increase in tourists' flow will progressively develop as follows:

- year 1: 30% normal operation;
- year 2: 40% normal operation;
- year 3: 50% normal operation;
- year 4: 60% normal operation;
- year 5: 80% normal operation.

YEAR	ADDITIONAL VISITORS	ADDITIONAL ARRIVALS	ADDITIONAL RECEIPTS	ECONOMIC BENEFITS
1				
2				
3	8,993	2,998	422,451	273,230
4	11,990	3,997	563,268	364,306
5	14,988	4,996	704,084	455,383
6	17,985	5,995	844,901	546,459
7	23,980	7,993	1,126,535	728,612
8	29,975	9,992	1,408,169	910,766
9	29,975	9,992	1,408,169	910,766
10	29,975	9,992	1,408,169	910,766
11	29,975	9,992	1,408,169	910,766
12	29,975	9,992	1,408,169	910,766
13	29,975	9,992	1,408,169	910,766
14	29,975	9,992	1,408,169	910,766
15	29,975	9,992	1,408,169	910,766
16	29,975	9,992	1,408,169	910,766
17	29,975	9,992	1,408,169	910,766

18	29,975	9,992	1,408,169	910,766
19	29,975	9,992	1,408,169	910,766
20	29,975	9,992	1,408,169	910,766

**TABLE 8 - ECONOMIC BENEFITS RELATED TO INCREASE IN TOURISTS' PRESENCE IN JERASH**

As shown in the below table, the total amount of economic benefits generated by the implementation of Jerash CRP will amount to 1.603 million of JD per year in situation of normal operation.

YEAR	TOURIST ECONOMIC BENEFITS	COMMERCIAL ECONOMIC BENEFITS	PARKING ECONOMIC BENEFITS	TOTAL ECONOMIC BENEFITS
1	-	-	-	-
2	-	-	-	-
3	273,230	97,927	22,055	393,212
4	364,306	233,060	44,111	641,476
5	455,383	368,193	66,166	889,741
6	546,459	503,326	88,221	1,138,006
7	728,612	619,856	110,276	1,458,744
8	910,766	582,649	110,276	1,603,691
9	910,766	582,649	110,276	1,603,691
10	910,766	582,649	110,276	1,603,691
11	910,766	582,649	110,276	1,603,691
12	910,766	582,649	110,276	1,603,691
13	910,766	582,649	110,276	1,603,691
14	910,766	582,649	110,276	1,603,691
15	910,766	582,649	110,276	1,603,691
16	910,766	582,649	110,276	1,603,691
17	910,766	582,649	110,276	1,603,691
18	910,766	582,649	110,276	1,603,691
19	910,766	582,649	110,276	1,603,691
20	910,766	582,649	110,276	1,603,691

**TABLE 9 – JERASH CRP ECONOMIC BENEFITS (IN JD)**

### 2.3.3 ECONOMIC EFFECTIVENESS

The indicators of return calculated are the Economic Net Present Value (ENPV) and the Economic Internal Rate of Return (EIRR).

Considering the difference between the time frame of the analysis, which is 20 years, and the useful economic life of the project, a residual value of 3,870 thousand of US\$ has been considered.

The net flow of economic benefits is determined by the difference between the economic benefits and costs considered for the purposes of the profitability analysis.

The results obtained (see the table in Annex 1) show an almost sufficient profitability for the project: a positive ENPV is found, evaluated at a discount rate of 12%, of 4,440 thousand US\$ and a EIRR of 22.5%.

In order to evaluate the economic stability of the project, a sensitivity analysis has been carried out. Taking into account changes on: benefits, investment costs and running costs, three hypotheses have been developed; the results are listed in the table below.

	HP1	HP2	HP3
Benefits Change	0	-15%	-10%
Investment costs change	10%	0	10%
Running costs change	10%	0	10%
<b>EIRR</b>	<b>30.9%</b>	<b>18.7%</b>	<b>14.7%</b>
<b>ENPV (.000 US\$)</b>	<b>6,099</b>	<b>2,538</b>	<b>1,091</b>

TABLE 10 – HYPOTHESIS A SENSITIVITY ANALYSIS

### 3. Annex 1 – Economic analysis table

ECONOMIC ANALYSIS FOR THE COMMUNITY – JERASH CRP

	YEARS																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>Investment costs</b>	390	2,825	710	3,689	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Running costs</b>	0	0	0	1	36	81	99	109	118	118	118	118	118	118	118	118	118	118	118	118
<b>Indirect economic benefits</b>	0	0	555	905	1,256	1,606	2,059	2,263	2,263	2,263	2,263	2,263	2,263	2,263	2,263	2,263	2,263	2,263	2,263	2,263
<b>Residual value</b>																				3,870
<b>Net benefits</b>	(390)	(2,825)	(155)	(2,784)	1,095	1,525	1,960	2,155	2,146	2,146	2,146	2,146	2,146	2,146	2,146	2,146	2,146	2,146	2,146	6,015
<b>Accrued net benefits</b>	(390)	(3,215)	(3,370)	(6,154)	(5,059)	(3,534)	(1,574)	580	2,726	4,872	7,017	9,163	11,308	13,454	15,600	17,745	19,891	22,036	24,182	30,197

<b>ECONOMIC IRR</b>	<b>22.5%</b>
<b>ECONOMIC PNV (,000 US\$)</b>	<b>4,440</b>
<b>BACK DISCOUNTING RATE</b>	<b>12,00%</b>

	HP1	HP2	HP3
Benefits change	0	-15%	-10%
Investment costs change	10%	0	10%
Running costs change	10%	0	10%
<b>EIRR</b>	<b>30.9%</b>	<b>18.7%</b>	<b>14.7%</b>
<b>VAN</b>	<b>6,099</b>	<b>2,538</b>	<b>1,091</b>