

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

Madaba

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 organisation
CRP	City revitalisation programme
DOS	Department of Statistics
EIA	Environmental Impact Assessment
GMM	Greater Madaba 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 Organisation
URP	Urban regeneration program
VEC	Valued Environmental Components
WB	The World Bank
WHL	World heritage List
WTO	World Trade Organisation

1. Introduction

The economic analysis of CRP proposal for Madaba has been developed from both a qualitative and a quantitative point of view. In particular, for the quantitative aspects, a cost-benefit analysis has been realized in order to evaluate the cost-effectiveness of the whole program, as well as of action n.M01 “Upgrading of the city core street network”, which is the single most significant and economically relevant among all the envisaged physical actions.

As for the other actions, the economic analysis has been conducted in terms of identification and qualitative analysis of economic effects, without proceeding with their quantification in monetary terms.

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 date of the works related to each of the envisaged actions.

ACTIONS	INVESTMENT COSTS (US\$)	DURATION	STARTING YEAR
M.01 Upgrading of the city core street network	3,159,638	31 months	1
M.02 The creation of a new Heritage Center in the Saraya Building	400,781	15 months	2
M.03 The re-design of the existing bus-station	864,563	16 months	2
M.04 The realization of open air leisure facilities	1,428,707	21 months	3
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 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 Madaba.

ACTIONS	YEARS				
	1	2	3	4	5
M.01 Upgrading of the city core street network	█	█	█	█	
M.02 Creation of a new Heritage Center in the Saraya Building		█	█		
M.03 Re-design of the existing bus station		█	█		
M.04 Realization of open air leisure facilities			█	█	
Capacity building	█	█	█		

TABLE 2 – ACTIONS’ TIME SHEET

1.2. DISTRIBUTIONAL EFFECTS

From a merely economic point of view, the main beneficiaries of Madaba 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 Madaba'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 Madaba.

In particular, the envisaged physical action n. 04 "Realization of open air leisure facilities" will create new opportunities for the establishment of entrepreneurial activities in those sectors more directly related to tourism and cultural activities. It will also improve job opportunities for the operators of the informal sector, who will be provided with a fixed market place for presenting and selling their home-made handicraft to a wider public.

Opportunities for easily "upgrading" formal and informal private existing activities to provide tourism or culture related services works and products could be found in the construction sector (skilled construction workers) that seems have grown during the last years. Development opportunities are also in the handicraft sector (formal and informal production) and, particularly, in the production of typical city's products (such as traditional food, embroidery, wood carving, etc) and in the mosaic setting training (work opportunity for educators) and production. It is, however, essential to make efforts to improve the more directly tourism-related services (restaurants, guides, etc) in order to enhance customer satisfaction of Madaba's visitors.

During the realisation phase, the most directly affected economic sector will be, obviously, that of construction, this will, in turn, strongly impact on small enterprises and craftsmen sectors.

During the management phase the most affected sectors will be the following:

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

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

2. Cost-benefit analysis of action M.01 “Upgrading of the city core street network”

2.1. 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 for the two above-mentioned alternatives. The operating costs considered in the analysis have been calculated on a forfeit base, according to the features of each alternative action, and have been broken down over the first 8 years of project's activity (considering both construction and operation phases).

A) WORKS	YEARS								TOTAL
	1	2	3	4	5	6	7	8	
a1) ROAD CONSTRUCTION									
Type A (Sq. Mts 8,513 x JD/sq.mt 22)	79,302	185,039							264,341
Type B (Sq. Mts 24,585 x JD/sq.mt 16)		55,520	277,600	222,080					555,200
Type C (Sq. Mts 21,974 x JD/sq.mt 11)		34,737	173,683	138,946					347,366
Ring Road Type B (Sq. Mts 21,430 x JD/sq.mt 16)		48,395	241,976	193,580					483,951
A2) UTILITIES UPGRADING	6.351	70,769	279,745	223,796					580,662
A3) ARTISTIC PAVING AND WORK OF ART	16.937	39,520							56,457
A4) TRAFFIC MANAGEMENT PLAN (Lump sum)		3,529	17,643	14,114					35,286
B) ADDITIONAL PROVISIONS									
b1) TECHNICAL EXPENSES									
Detailed design consultancy (8% of A)	8.207	35,001	79,252	63,401					185,861
Construction supervision and management (8% of A)	8.207	35,001	79,252	63,401					185,861
Topographical & archaeological surveys/specialistic investigations (5% of A)	5.130	21,875	49,532	39,626					116,163
b2) CONTINGENCIES (15% of A)	15.389	65,626	148,597	118,878					348,489
TOTAL COST OF THE ADDITIONAL PROVISION	36.933	157,503	356,633	285,306					836,375
FINAL ACTION PROJECT COST (A+B)	139.524	595,011	1,347,280	1,077,824					3,159,638
C) OPERATING COSTS			6,000	12,000	18,000	24,000	30,000	30,000	120,000

TABLE 3 - INVESTMENT AND OPERATING COSTS (IN US\$) ACTION M.01

As shown by the table above, the investment costs for the action amount to a total of 3,160 millions US\$.

2.2. BENEFITS

The interventions aimed at upgrading and improving urban spaces can generate economic benefits related to the sales' increase foreseeable for the shops located within the city core, due to the Project generated improvement in streetscape quality, that will make the whole area more attractive for walking and shopping. Another effect of the project implementation is represented by the increase in real estates values, but this second benefit category has not been quantified since it could be very difficult to estimate the building volume involved.

The following table shows the main data on sector enterprises in Madaba.

SECTOR	NO. OF ESTABLISHMENT	%	EMPLOYMENT	%	TOTAL VALUE ADDED	%	TOTAL GROSS OUTPUT	%	TOTAL SALES (JD)	%
Manufacturing	327	12%	885	16%	1,363,717	14%	3,941,793	23%	3,941,793	7%
Trade	1,770	65%	3,561	64%	5,835,277	61%	8,796,442	52%	47,710,922	85%
Services	629	23%	1,118	20%	2,340,431	25%	4,303,519	25%	4,303,519	8%
Total	2,726	100%	5,564	100%	9,539,425	100%	17,041,754	100%	55,956,234	100%

TABLE 4 - DATA ABOUT SECTOR ENTERPRISES IN MADABA BY 2002

The hypothesis taken into account is that only the growth in the value added generated by the increase of shops' sales has to be considered in the benefit estimation. However, the amount of this growth will vary according to the scope of the interventions realised. Since the action includes the upgrading of part of the Ring Road, it is reasonable to foresee a value added growth of 8%.

Economic benefits will therefore amount to 763,154 JD per year in situation of normal operation.

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.

2.3. 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 341 thousand US\$ has been estimated.

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

The results obtained (see the tables in Annex 1) show an almost sufficient profitability for the project: a positive ENPV is found, evaluated at a discount rate of 12%, of 2,666 thousand US\$ and a EIRR of 28.9%.

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 shown in the table below.

	HP1	HP2	HP3
Benefits Change	0	-15%	-10%
Investment costs change	10%	0	10%
Running costs change	10%	0	10%
EIRR	34.3%	24.6%	20.0%
ENPV (,000 US\$)	3,109	1,904	1,270

TABLE 5 - SENSITIVITY ANALYSIS

3. Economic analysis of other actions

3.1. M.02 THE CREATION OF A NEW HERITAGE CENTER IN THE SARAYA BUILDING

The restoration of the Saraya Building and its conversion in a new Heritage Center will provide the city with a new symbolic core, where discover and preserve Madaba's history, cultural heritage and living traditions. A stronger cultural awareness among Madaba's citizens could stimulate a pro-active attitude towards the revitalisation of the city and its further valorisation as tourist destination.

The new Heritage Center will also contribute to recover the city's social cohesion, which has been highly compromised by the intense transformations undergone in recent decades, thus increasing the opportunities for cooperation among different social groups towards the city development. Therefore, the Center could become the core from which to co-ordinate all efforts aimed at improving Madaba's living conditions and quality of life, representing also the main focal point around which the city social capital will converge, that is one of the main factors for boosting socio-economic development.

3.2. M.03 THE RE-DESIGN OF THE EXISTING BUS STATION

The re-design of the existing bus station will result in a rationalization of traffic patterns all over Madaba city center, thus:

- making it a more pleasant destination to reach and visit not only for Madaba's residents, but also for commuters from surrounding villages and tourists;
- reducing traffic jams and congestion.

Moreover, a re-designed and more comfortable bus station will improve the overall quality of life of the passengers who daily use buses to reach/leave Madaba for job reasons. In some cases, this improvement will also succeed in encouraging citizens to use public transportation for moving from/to the city, thus resulting in a further reduction of traffic jams and congestion within centre.

Finally, in many cases, the bus station represents the first contact of the visitors with the city, as its re-design will result in a better visual impact on the foreigners, thus increasing the number of tourists who decide to stop and visit Madaba.

3.3. M.04 THE REALIZATION OF LEISURE AND HANDICRAFT FACILITIES

The realization of a leisure park supported by several structures dedicated to the promotion of local handicraft will have many positive effects on Madaba socio-economic environment.

First of all the leisure park, being located within the urban fabric of the city core, can easily develop into an enclave for social reunion, thus providing the citizens with some of those cultural venues they now claim for. Consequently, this will improve the quality of life of Madaba's residents, contributing to prevent youth from leaving Madaba to entertain themselves, and the city centre 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 the handicraft centre can offer to the many informal operators in Madaba a permanent place from where to sell their product to a wider public, thus incrementing their income and encouraging them to emerge from the informal sector.

Finally, the adaptive reuse of the existing buildings located in the proximity of the park will stimulate the implementation of new tourist related economic activities (such as cafes, res-

taurants, hotels, handicraft centre, etc.) thus contributing to make Madaba far more attractive for tourists.

3.4. THE CAPACITY BUILDING ACTION

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

Indeed, as clearly emerged from the analysis carried out in Section 5 of Annex 1 “Detailed description of the CRP”, 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 specifically addressed to the Public Administration officers, who will have, after all, the ultimate responsibility for the CRP implementation, the results achieved by the Program will not be able to consolidate and, consequently, to fully activate the socio-economic benefits described above.

4. The Madaba CRP- cost-benefit analysis

4.1. INVESTMENT AND OPERATING COSTS

The following table presents both investment and operating costs of the Madaba CRP, as presented in Annex 1 “Detailed description of the CRP”.

A) WORKS	YEARS								TOTAL
	1	2	3	4	5	6	7	8	
Road construction	79,302	323,690	693,258	554,607					1,650,858
Utilities upgrading	6,351	70,769	279,745	223,796					580,662
Traffic management plan		3,529	17,643	14,114					35,286
Artistic paving and work of art	16,937	39,520							56,457
Restoration of the existing buildings		111,009	90,826						201,834
Public piazza and garden		13,399	17,411	122,528					153,338
Internal furnishing			93,154	144,474					237,628
Static consolidation and structural reconstruction				42,343					42,343
Rehabilitation of the existing buildings		192,519	157,516	240,790					590,825
Bus parking areas		68,624	56,147						124,770
Green areas		10,868	8,892						19,760
Special canopy structures		77,629	63,514						141,143
Hard landscape and special structures			14,114	268,172					282,286
TOTAL COST OF WORKS	102,591	911,555	1,492,221	1,610,824					4,117,191
B) ADDITIONAL PROVISIONS (AP)									
b1) TECHNICAL EXPENSES									
Detailed design consultancy (8% of A)	8,207	72,924	111,925	113,921					306,978
Construction supervision and management (8% of A)	8,207	72,924	111,925	113,921					306,978
Topographical & archaeological surveys/specialistic investigations (5% of A)	5,130	45,578	69,953	66,385					187,045
B2) CONTINGENCIES (15% OF A)	15,389	136,733	209,860	213,601					575,583
TOTAL COST OF AP	36,933	328,160	503,664	507,827					1,376,583
C) LAND ACQUISITION			359,915						359,915
D) CAPACITY BUILDING (CB)									
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
TOTAL COST OF CB	185,380	73,630	36,880	26,880	134,880				457,650
FINAL ACTION PROJECT COST (A+B+C+D)	324,904	1,313,345	2,392,680	2,145,530	134,880				6,311,339
E) OPERATING COSTS			11,458	30,287	59,217	78,146	118,526	118,526	416,159

TABLE 6 - INVESTMENT AND OPERATING COSTS (IN US\$) OF MADABA CRP

As shown by the table above, the investment costs for the CRP, including the intervention on part of the Ring Road, amount to a total of 6,311,339 US\$, while the operating costs for the first 8 years of program life amount to 416,159 US\$.

4.2. BENEFITS

The economic benefits generated by the implementation of the Madaba CRP can be quantified considering, together with the benefits already calculated with reference to the action M.01, the effects of the project implementation on tourist presence in Madaba.

In this regard, it should be noted that, in order to avoid duplications in the estimation of benefits, the increase in value added estimated for the quantification of the economic benefits of action M.01, in this section is considered without the increase in expenditures for shopping generated from the additional tourists coming to visit Madaba.

In fact, 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 leisure facilities will definitely contribute to increase the tourism attractiveness of Madaba. The increase in visitors could induce a more general increase in tourism revenues, resulting from the total expenditures. Therefore, the indirect benefits of Madaba 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 visit Madaba in any case. The resulting increase in tourist expenditure has been estimated multiplying the current tourists' average daily expenditure by the increase in the number of tourists.

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

	1998	1999	2000	2001	2002	2003
USA and Canada	14,616	19,432	18,991	6,595	2,410	3,079
Europe	96,361	130,918	138,537	54,080	30,075	29,107
Asia	5,076	7,945	11,284	4,196	2,508	3,728
Australia & New Zealand	1,046	1,275	1,172	415	399	441
Arab Countries	1,063	1,974	1,767	1,845	1,598	2,454
Jordan	1,564	1,874	618	470	363	842
Israel	4,582	9,851	8,147	392	100	223
African Countries	406	236	121	63	51	78
TOTAL	124,714	173,505	180,637	68,056	37,504	39,952

TABLE 7 - NUMBER OF VISITORS TO MADABA CHURCH OF THE MAP 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 8%; to 2003, of 55%.

	COMPARED TO 1999	COMPARED TO 2003
3	2%	16%
4	3%	22%
5	4%	27%
6	5%	33%
7	6%	44%
8	8%	55%

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

	Tourist	Accommodation	Food and drinks	Health treatment	Study/universities etc.	Internal transports	Recreation	Shopping	Group tours	Other expenditure	
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 8 - TOTAL VALUE ADDED OF INDUSTRIAL SECTOR FOR 2002- NATIONAL LEVEL (JD 000)

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 5: 80% NORMAL OPERATION.YEAR	ADDITIONAL VISITORS	ADDITIONAL ARRIVALS	ADDITIONAL RECEIPTS	ECONOMIC BENEFITS
1				
2				
3	5,419	1,806	254,580	164,655
4	7,225	2,408	339,439	219,540
5	9,032	3,011	424,299	274,425
6	10,838	3,613	509,159	329,310
7	14,451	4,817	678,879	439,080
8	18,064	6,021	848,599	548,851
9	18,064	6,021	848,599	548,851
10	18,064	6,021	848,599	548,851
11	18,064	6,021	848,599	548,851
12	18,064	6,021	848,599	548,851
13	18,064	6,021	848,599	548,851
14	18,064	6,021	848,599	548,851
15	18,064	6,021	848,599	548,851
16	18,064	6,021	848,599	548,851
17	18,064	6,021	848,599	548,851
18	18,064	6,021	848,599	548,851
19	18,064	6,021	848,599	548,851
20	18,064	6,021	848,599	548,851

TABLE 9 - ECONOMIC BENEFITS RELATED TO INCREASE IN TOURISTS' PRESENCE IN MADABA

As shown in the table above, the economic benefits in the situation of normal operation will be of 548,851 JD per year.

In the following table the total amount of the economic benefits generated by the implementation of Madaba CRP are presented.

YEAR	TOURIST ECONOMIC BENEFITS	COMMERCIAL ECONOMIC BENEFITS	TOTAL ECONOMIC BENEFITS
1	-	-	-
2	-	-	-
3	164,655	118,999	283,654
4	219,540	260,419	479,959
5	274,425	401,839	676,264
6	329,310	543,259	872,569
7	439,080	673,468	1,112,548
8	548,851	651,046	1,199,897
9	548,851	651,046	1,199,897
10	548,851	651,046	1,199,897
11	548,851	651,046	1,199,897
12	548,851	651,046	1,199,897
13	548,851	651,046	1,199,897
14	548,851	651,046	1,199,897
15	548,851	651,046	1,199,897
16	548,851	651,046	1,199,897
17	548,851	651,046	1,199,897
18	548,851	651,046	1,199,897
19	548,851	651,046	1,199,897
20	548,851	651,046	1,199,897

TABLE 10 – MADABA CRP ECONOMIC BENEFITS

According to the above, the total amount of economic benefits generated by the implementation of Madaba CRP will amount to 1.200 millions of JD in situation of normal operation.

4.3. ECONOMIC EFFECTIVENESS

The results obtained (see the tables in Annex 1) show an almost sufficient profitability for Madaba CRP: a positive ENPV is found, evaluated at a discount rate of 12%, of 3,250 thousand US\$ and a EIRR of 22.3%.

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 shown in the table below.

	HP1	HP2	HP3
Benefits Change	0	-15%	-10%
Investment costs change	10%	0	10%
Running costs change	10%	0	10%
EIRR	27.3%	18.4%	14.4%
ENPV (.000 US\$)	3,960	1,820	724

TABLE 11 – SENSITIVITY ANALYSIS

A residual value of 2,928 thousand of US\$ has been considered.

5. Annex 1 – Economic analysis tables

ECONOMIC ANALYSIS FOR THE COMMUNITY – ACTION M.01 – UPGRADING OF THE CITY CORE STREET NETWORK

	YEARS																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Investment costs	129	552	1,250	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Running costs			6	12	18	24	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Indirect economic benefits	0	0	215	431	646	862	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077
Residual value																				341
Net benefits	(129)	(552)	(1,041)	(581)	628	838	1,047	1,047	1,047	1,388										
Accrued net benefits	(129)	(682)	(1,722)	(2,304)	(1,676)	(838)	209	1,256	2,304	3,351	4,398	5,445	6,492	7,539	8,586	9,634	10,681	11,728	12,775	14,163

ECONOMIC IRR	28.9%
ECONOMIC PNV (,000 US\$)	2,666
BACK DISCOUNTING RATE	12.00%

	HP1	HP2	HP3
Benefits change	0	-15%	-10%
Investment costs change	10%	0	10%
Running costs change	10%	0	10%
EIRR	34.3%	24.6%	20.0%
VAN	3,109	1,904	1,270

ECONOMIC ANALYSIS FOR THE COMMUNITY – MADABA CRP

	YEARS																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Investment costs	302	1,219	2,220	1,991	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Running costs			11	30	59	78	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Indirect economic benefits	0	0	400	677	954	1,232	1,570	1,694	1,694	1,694	1,694	1,694	1,694	1,694	1,694	1,694	1,694	1,694	1,694	1,694
Residual value																				2,928
Net benefits	(302)	(1,219)	(1,832)	(1,344)	770	1,153	1,479	1,602	1,602	1,602	1,602	1,602	4,530							
Accrued net benefits	(302)	(1,520)	(3,352)	(4,696)	(3,926)	(2,772)	(1,294)	308	1,910	3,512	5,114	6,716	8,318	9,920	11,522	13,124	14,726	16,328	17,930	22,460

ECONOMIC IRR	22.3%
ECONOMIC PNV (,000 US\$)	3,250
BACK DISCOUNTING RATE	12,00%

	HP1	HP2	HP3
Benefits change	0	-15%	-10%
Investment costs change	10%	0	10%
Running costs change	10%	0	10%
EIRR	27.3%	18.4%	14.4%
VAN	3,960	1,820	724