Supporting Report XVIII Economic and Financial Evaluation

FEASIBILITY STUDY
ON
WATER RESOURCES DEVELOPMENT
IN
RURAL AREA
IN
THE KINGDOM OF MOROCCO

FINAL REPORT

VOLUME V
SUPPORTING REPORT (2.B)
FEASIBILITY STUDY

SUPPORTING REPORT XVIII
ECONOMIC AND FINANCIAL EVALUATION

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ECONOMIC AND FINANCIAL EVALUATION

XVIII1 General

The methodology and process applied for economic and financial evaluation of the Projects are described in Chapter 10 of Main Report. Therefore, only the supporting information will be provided in this Supporting Report XVIII.

XVIII2 Economic Analysis

XVIII2.1 Economic Prices of Agricultural Inputs and Outputs

Economic prices of agricultural inputs and outputs are estimated for both with and without project conditions on the assumption that the quality of the inputs and the outputs would be different between the two conditions.

Table XVIII2.1.1 shows the calculation of the economic prices of agricultural crops and inputs under "without project" condition and Table XVIII2.1.2 shows those under "with project" condition.

XVIII2.2 Economic Evaluation of Irrigation Alternative Study

XVIII2.2.1 Benefit of the Alternative Plans

Features of the Alternative Plans are presented in Table XVIII2.2.1.

The Study Team, as presented in Table XVIII2.2.2, has estimated farm income by the project sites under the present condition (without project). Breakdown of crop production cost by project site under the same condition is presented in Table XVIII2.2.3.

Table XVIII2.2.4 shows expected net income by crop with project and Table XVIII2.2.5 shows expected firm income with project.

The incremental net income by each alternative plan is estimated as shown in Table XVIII2.2.6.

XVIII2.2.2 Economic Project Cost

The financial and economic project costs are shown in Table XVIII2.2.7 and the annual economic costs are shown in Table XVIII2.2.8.

XVIII2.2.3 Results of Economic Evaluation

Cash flow of the projects is presented in Table XVIII2.2.9 and the results of economic evaluation of the irrigation alternative plans are shown in Table XVIII2.2.10.

XVIII2.3 Economic Analysis of Small-scale Water Supply

The estimation of benefits of the small-scale water supply is described in Subsection 10.1.4 of the Main Report. Financial and economic cost estimate of the facilities are presented in Tables XVIII2.3.1. Annual economic costs of the facilities are shown in Tables XVIII2.3.2. Cost-benefit analysis for water supply by using the costs of exclusive-use facilities (without dam construction cost) is shown in Table XVIII2.3.3.

XVIII2.4 Economic Evaluation of the Priority Projects

XVIII2.4.1 Benefit of the Projects

The agricultural benefits have already been discussed in the irrigation alternative study.

Flood and erosion control benefits are estimated from mitigation of flood damages between those with and without project. In this project, only the damages to agricultural crops and agricultural facilities are taken into account since they are the major damages in the project areas. The flood damages to agricultural production are estimated from decrease of expected net income and loss of the production cost spent until the flood occurrence. The flood and erosion damages are estimated based on the following assumption:

- The damageable areas by inundation and erosion are estimated by the same proportion as actual damaged areas obtained by the interview survey as shown in Table XVIII2.4.1.
- The magnitude of the floods reported by the interview survey were assumed 1/5-year flood.
- No flood damage is assumed for 1/2-year flood.
- The floods are assumed to occur at the middle of cultivation when half of production cost has already been spent.
- A damage rate of 100% is assumed for both inundation and erosion considering a strong current during floods.
- After a flood, it is assumed that the submerged farmland is not usable for three years due to sedimentation and the eroded farmland is not usable for five years.
- Flood damages to irrigation facilities are assumed the same amount as the

agricultural damage by inundation.

Based on the above assumption, the flood and erosion control benefits were estimated as shown in Tables XVIII2.4.2 and XVIII2.4.3.

Indirect benefit (economically induced benefit) of the Projects has been estimated by using “the Detailed Input-Output Table for Morocco, 1990”. According to the table, an investment for construction sector will induce various production increase in other sectors and it will create approximately 37 % of added value against the investment as calculated in Table XVIII2.4.4. On the other hand, an investment for agricultural production will create approximately 12% of added value in other various sectors against the investment as shown in Table XVIII2.4.5. These added values have been estimated as the indirect benefit of the projects.

XVIII2.4.2 Economic Project Cost

The financial and economic costs including whole components of the Projects are shown in Table XVIII2.4.6 and the annual economic costs are shown in Table XVIII2.4.7.

XVIII2.4.3 Results of the Evaluation

The economic analyses of the projects have been conducted both the cases of with and without the indirect benefit (economically induced benefit). Cash flow of the projects is presented in Table XVIII2.4.8.

XVIII3 Financial Analysis

XVIII3.1 Financial Cost

Based on the current market prices and costs as of April 2000, the financial construction costs of the projects are estimated as shown in Table XVIII2.4.6. Annual disbursement schedule of the project cost based on the implementation schedule is presented in Table XVIII3.1.1.

XVIII3.2 Repayment of Project Cost

Financial cash flow statement by project for the proposed development plan using the anticipated project revenue and fund requirement is prepared as shown in Table XVIII3.2.1.

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Table XVIII2.1.1: Calculation of Economic Price of Agricultural Crops and Inputs (1/3)
(Without Project)

Hard Wheat

	Unit	N'fifikh	Taskourt	Timkit	Azghar
FOB at point of export	US$/ton	107	-	107	107
Freight and insurance	US$/ton	23	-	23	23
CIF Casablanca	US$/ton	130	-	130	130
CIF Casablanca	DH/ton	1,388	-	1,388	1,388
(Exchange rate: US$1 = 10.68 DH)					
Landing and port charges	DH/ton	129	-	129	129
Transportation/distribution	DH/ton	46	-	361	156
Farm gate price (import parity)	DH/ton	1,564	-	1,879	1,673
Actual farm gate price	DH/ton	2,540	-	3,330	3,230
Conversion factor		0.62	-	0.56	0.52

Note: - FOB at point of export: World Bank Commodity Price Data, January 2001
- FOB at point of export is an average price of three years from Jan 1998 to December 2000
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.

Soft Wheat

	Unit	N'fifikh	Taskourt	Timkit	Azghar
FOB at point of export	US$/ton	93	93	-	-
Freight and insurance	US$/ton	23	23	-	-
CIF Casablanca	US$/ton	116	116	-	-
CIF Casablanca	DH/ton	1,239	1,239	-	-
(Exchange rate: US$1 = 10.68 DH)					
Landing and port charges	DH/ton	129	129	-	-
Transportation/distribution	DH/ton	46	135	-	-
Farm gate price (import parity)	DH/ton	1,414	1,503	-	-
Actual farm gate price	DH/ton	2,540	2,890	-	-
Conversion factor		0.56	0.52	-	-

Note: - FOB at point of export: World Bank Commodity Price Data, January 2001
- FOB at point of export is an average price of three years from Jan 1998 to December 2000
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.

Barley

	Unit	N'fifikh	Taskourt	Timkit	Azghar
CIF Casablanca	DH/ton	835	835	835	835
Landing and port charges	DH/ton	129	129	129	129
Transportation/distribution	DH/ton	46	135	361	156
Farm gate price (import parity)	DH/ton	1,010	1,099	1,325	1,120
Actual farm gate price	DH/ton	1,540	2,520	1,980	2,000
Conversion factor		0.66	0.44	0.67	0.56

Note: - CIF Casablanca is estimated based on statistical data of import volume and value kept by Office of Change, Morocco
- CIF Casablanca is an average price of five years from 1995 to 1999
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.

Table XVIII2.1.1: Calculation of Economic Price of Agricultural Crops and Inputs (2/3)
(Without Project)

Tomato

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	1,440	2,040	2,290	2,070
Standard conversion factor		0.86	0.86	0.86	0.86
Estimated farm gate price	DH/kg	1,238	1,754	1,969	1,780

Note: - The standard conversion factor has been applied on the assumption that most of the crop would be consumed domestically.

Potato

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	2,060	2,040	2,340	2,990
Standard conversion factor		0.86	0.86	0.86	0.86
Estimated farm gate price	DH/kg	1,772	1,754	2,012	2,571

Note: - The standard conversion factor has been applied on the assumption that most of the crop would be consumed domestically.

Watermelon

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	-	4,000	3,750	-
Standard conversion factor		-	0.86	0.86	-
Estimated farm gate price	DH/ton	-	3,440	3,225	-

Note: - The standard conversion factor has been applied on the assumption that most of the crop would be consumed domestically.

Grape

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	2,920	-	-	-
Standard conversion factor		0.86	-	-	-
Estimated farm gate price	DH/ton	2,511	-	-	-

Note: - The standard conversion factor has been applied on the assumption that most of the crop would be consumed domestically.

Olive

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	2,070	2,610	2,690	3,040
Standard conversion factor		0.86	0.86	0.86	0.86
Estimated farm gate price	DH/ton	1,780	2,245	2,313	2,614

Note: - The standard conversion factor has been applied on the assumption that most of the crop would be consumed domestically.

Broad Bean

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	3,930	3,870	-	3,730
Standard conversion factor		0.86	0.86	-	0.86
Estimated farm gate price	DH/ton	3,380	3,328	-	3,208

Note: - The standard conversion factor has been applied on the assumption that the crop would be used for domestic consumption only.

Table XVIII2.1.1: Calculation of Economic Price of Agricultural Crops and Inputs (3/3)
(Without Project)

Almond

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	-	48,240	-	-
Standard conversion factor		-	0.86	-	-
Estimated farm gate price	DH/ton	-	41,486	-	-

Note: - The standard conversion factor has been applied on the assumption that most of the crop would be consumed domestically.

Dates

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	-	-	8,000	-
Standard conversion factor		-	-	0.86	-
Estimated farm gate price	DH/ton	-	-	6,880	-

Note: - The standard conversion factor has been applied on the assumption that most of the crop would be consumed domestically.

Fodder

	Unit	Alfalfa	Barley	Straw of cereals
Actual farm gate price	DH/UF	5.20	3.00	3.00
Standard conversion factor		0.86	0.86	0.86
Estimated farm gate price	DH/UF	4.47	2.58	2.58

Note: - The standard conversion factor has been applied on the assumption that fodder would be a non-traded commodity.

Fertilizer

	Unit	Urea (46%N)	TSP (45%P2O5)	P. Chloride (60%K2O)	Other fertilizer	Agricultural chemical
FOB at point of export	US$/ton	91	144	113		
Freight and insurance	US$/ton	23	23	23		
CIF Casablanca	US$/ton	114	167	136		
CIF Casablanca	DH/ton	1,218	1,784	1,452		
(Exchange rate: US$1 = 10.68 DH)					Average of	Average of
Landing and port charges	DH/ton	129	129	129	fertilizer	fertilizer
Transportation/distribution	DH/ton	46	46	46		
Import parity value	DH/ton	1,393	1,959	1,628		
Actual market price	DH/ton	1,639	1,947	2,280		
Conversion factor		0.85	1.01	0.71	0.85	0.85

Note: - FOB at point of export: World Bank Commodity Price Data, January 2001
- FOB at point of export is an average price of three years from Jan 1998 to December 2000
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.
- The conversion factor for agricultural chemical is assumed as an average of fertilizers.

Table XVIII2.1.2: Calculation of Economic Price of Agricultural Crops and Inputs (1/5)
(With Project)

Hard Wheat

	Unit	N'fifikh	Taskourt	Timkit	Azghar
FOB at point of export	US$/ton	107	-	107	107
Freight and insurance	US$/ton	23	-	23	23
CIF Casablanca	US$/ton	130	-	130	130
CIF Casablanca	DH/ton	1,388	-	1,388	1,388
(Exchange rate: US$1 = 10.68 DH)					
Landing and port charges	DH/ton	129	-	129	129
Transportation/distribution	DH/ton	46	-	361	156
Farm gate price (import parity)	DH/ton	1,564	-	1,879	1,673
Actual farm gate price	DH/ton	2,540	-	3,330	3,230
Conversion factor		0.62	-	0.56	0.52

Note: - FOB at point of export: World Bank Commodity Price Data, January 2001
- FOB at point of export is an average price of three years from Jan 1998 to December 2000
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.

Soft Wheat

	Unit	N'fifikh	Taskourt	Timkit	Azghar
FOB at point of export	US$/ton	93	93	-	-
Freight and insurance	US$/ton	23	23	-	-
CIF Casablanca	US$/ton	116	116	-	-
CIF Casablanca	DH/ton	1,239	1,239	-	-
(Exchange rate: US$1 = 10.68 DH)					
Landing and port charges	DH/ton	129	129	-	-
Transportation/distribution	DH/ton	46	135	-	-
Farm gate price (import parity)	DH/ton	1,414	1,503	-	-
Actual farm gate price	DH/ton	2,540	2,890	-	-
Conversion factor		0.56	0.52	-	-

Note: - FOB at point of export: World Bank Commodity Price Data, January 2001
- FOB at point of export is an average price of three years from Jan 1998 to December 2000
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.

Barley

	Unit	N'fifikh	Taskourt	Timkit	Azghar
CIF Casablanca	DH/ton	835	835	835	835
Landing and port charges	DH/ton	129	129	129	129
Transportation/distribution	DH/ton	46	135	361	156
Farm gate price (import parity)	DH/ton	1,010	1,099	1,325	1,120
Actual farm gate price	DH/ton	1,540	2,520	1,980	2,000
Conversion factor		0.66	0.44	0.67	0.56

Note: - CIF Casablanca is estimated based on statistical data of import volume and value kept by Office of Change, Morocco
- CIF Casablanca is an average price of five years from 1995 to 1999
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.

Tomato

	Unit	N'fifikh	Taskourt	Timkit	Azghar
FOB Casablanca	DH/ton	4,114	4,114	4,114	4,114
Loading and port charges	DH/ton	129	129	129	129
Collection/transportation	DH/ton	46	135	361	156
Farm gate price (export parity)	DH/ton	3,939	3,850	3,624	3,829
Farm gate price without project	DH/ton	1,238	1,754	1,969	1,780
Applied farm gate price with project	DH/ton	2,048	2,383	2,466	2,395

Note: - FOB Casablanca is estimated based on statistical data of export volume and value kept by Office of Change, Morocco
- FOB Casablanca is an average price of five years from 1995 to 1999
- Loading, port charges, collection, and transportation costs have been converted into economic value by using the standard conversion factor of 0.86.
- The applied farm gate price with project is estimated on assumption that 30% of the crop is sufficient quality for external trade.

Table XVIII2.1.2: Calculation of Economic Price of Agricultural Crops and Inputs (2/5)
(With Project)

Potato

	Unit	N'fifikh	Taskourt	Timkit	Azghar
FOB Casablanca	DH/ton	3,464	3,464	3,464	3,464
Loading and port charges	DH/ton	129	129	129	129
Collection/transportation	DH/ton	46	135	361	156
Farm gate price (export parity)	DH/ton	3,289	3,200	2,974	3,179
Farm gate price without project	DH/ton	1,722	1,754	2,012	2,571
Applied farm gate price with project	DH/ton	1,923	1,899	2,109	2,632

Note: - FOB Casablanca is estimated based on statistical data of export volume and value kept by Office of Change, Morocco
- FOB Casablanca is an average price of five years from 1995 to 1999
- Loading, port charges, collection, and transportation costs have been converted into economic value by using the standard conversion factor of 0.86.
- The applied farm gate price with project is estimated on assumption that 10% of the crop is sufficient quality for external trade.

Watermelon

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	-	4,000	3,750	-
Standard conversion factor		-	0.86	0.86	-
Estimated farm gate price	DH/ton	-	3,440	3,225	-

Note: - The standard conversion factor has been applied on the assumption that most of the crop would be consumed domestically.

Grape

	Unit	N'fifikh	Taskourt	Timkit	Azghar
FOB Casablanca	DH/ton	11,664	-	-	-
Landing and port charges	DH/ton	129	-	-	-
Transportation/distribution	DH/ton	46	-	-	-
Farm gate price (import parity)	DH/ton	11,489	-	-	-
Farm gate price without project	DH/ton	2,511	-	-	-
Applied farm gate price with project	DH/ton	2,601	-	-	-

Note: - FOB Casablanca is estimated based on statistical data of export volume and value kept by Office of Change, Morocco
- FOB Casablanca is an average price of five years from 1995 to 1999
- Loading, port charges, collection, and transportation costs have been converted into economic value by using the standard conversion factor of 0.86.
- The applied farm gate price with project is estimated on assumption that 1% of the crop is sufficient quality for external trade.

Olive

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	2,070	2,610	2,690	3,040
Standard conversion factor		1.13	1.05	0.99	0.99
Estimated farm gate price	DH/ton	2,349	2,739	2,658	3,020

Note: - The average conversion factor of tomato and potato has been applied since most of olive is exported after processing and actual farm gate price of olive is not directly compared with its export parity value.

Broad Bean

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	3,930	3,870	-	3,730
Standard conversion factor		0.86	0.86	-	0.86
Estimated farm gate price	DH/ton	3,380	3,328	-	3,208

Note: - The standard conversion factor has been applied on the assumption that most of the crop would be consumed domestically.

Almond

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ton	-	48,240	-	-
Standard conversion factor		-	0.86	-	-
Estimated farm gate price	DH/ton	-	41,486	-	-

Note: - The standard conversion factor has been applied on the assumption that most of the crop would be consumed domestically.

Table XVIII2.1.2: Calculation of Economic Price of Agricultural Crops and Inputs (3/5)
(With Project)

Dates

	Unit	N'fifikh	Taskourt	Timkit	Azghar
CIF Casablanca	DH/ton	-	-	15,239	-
Landing and port charges	DH/ton	-	-	129	-
Transportation/distribution	DH/ton	-	-	361	-
Farm gate price (import parity)	DH/ton	-	-	15,729	-
Farm gate price without project	DH/ton	-	-	6,880	-
Applied farm gate price with project	DH/ton	-	-	11,305	-

Note: - CIF Casablanca is estimated based on statistical data of import volume and value kept by Office of Change, Morocco
- CIF Casablanca is an average price of five years from 1995 to 1999
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.
- The applied farm gate price with project is estimated from an average of export parity value and the farm gate price without project on assumption that 50 % of the crop is sufficient quality for external trade.

Fodder

	Unit	Alfalfa	Barley	Straw of cereals
Actual farm gate price	DH/UF	5.20	3.00	3.00
Standard conversion factor		0.86	0.86	0.86
Estimated farm gate price	DH/UF	4.47	2.58	2.58

Note: - The standard conversion factor has been applied on the assumption that fodder would be a non-traded commodity.

Seed of Hard Wheat

	Unit	N'fifikh	Taskourt	Timkit	Azghar
CIF Casablanca	DH/ton	3,346	-	3,346	3,346
Landing and port charges	DH/ton	129	-	129	129
Transportation/distribution	DH/ton	46	-	361	156
Estimated farm gate price	DH/ton	3,521	-	3,836	3,631
Actual farm gate price	DH/ton	4,000	-	4,000	4,000
Conversion factor		0.88	-	0.96	0.91

Note: - CIF Casablanca is estimated based on statistical data of import volume and value kept by Office of Change, Morocco
- CIF Casablanca is an average price of five years from 1995 to 1999
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.

Seed of Soft Wheat

	Unit	N'fifikh	Taskourt	Timkit	Azghar
CIF Casablanca	DH/ton	2,631	2,631	-	-
Landing and port charges	DH/ton	129	129	-	-
Transportation/distribution	DH/ton	46	135	-	-
Estimated farm gate price	DH/ton	2,806	2,895	-	-
Actual farm gate price	DH/ton	4,000	4,000	-	-
Conversion factor		0.70	0.72	-	-

Note: - CIF Casablanca is estimated based on statistical data of import volume and value kept by Office of Change, Morocco
- CIF Casablanca is an average price of five years from 1995 to 1999
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.

Seed of Barley

	Unit	N'fifikh	Taskourt	Timkit	Azghar
CIF Casablanca	DH/ton	3,222	3,222	3,222	3,222
Landing and port charges	DH/ton	129	129	129	129
Transportation/distribution	DH/ton	46	135	361	156
Estimated farm gate price	DH/ton	3,397	3,486	3,712	3,507
Actual farm gate price	DH/ton	4,000	4,000	4,000	4,000
Conversion factor		0.85	0.87	0.93	0.88

Note: - CIF Casablanca is estimated based on statistical data of import volume and value kept by Office of Change, Morocco
- CIF Casablanca is an average price of five years from 1995 to 1999
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.

Table XVIII2.1.2: Calculation of Economic Price of Agricultural Crops and Inputs (4/5)
(With Project)

Seed of Tomato

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/kg	820	820	820	820
Standard conversion factor		0.86	0.86	0.86	0.86
Estimated farm gate price	DH/kg	705	705	705	705

Note: - The standard conversion factor has been applied on the assumption that seed of tomato would be a non-traded commodity.

Seed of Potato

	Unit	N'fifikh	Taskourt	Timkit	Azghar
CIF Casablanca	DH/ton	3,853	3,853	3,853	3,853
Landing and port charges	DH/ton	129	129	129	129
Transportation/distribution	DH/ton	46	135	361	156
Estimated farm gate price	DH/ton	4,028	4,117	4,343	4,138
Actual farm gate price	DH/ton	3,500	3,500	3,500	3,500
Conversion factor		1.15	1.18	1.24	1.18

Note: - CIF Casablanca is estimated based on statistical data of import volume and value kept by Office of Change, Morocco
- CIF Casablanca is an average price of five years from 1995 to 1999
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.

Seed of Watermelon

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/kg	-	250	250	-
Standard conversion factor		-	0.86	0.86	-
Estimated farm gate price	DH/kg	-	215	215	-

Note: - The standard conversion factor has been applied on the assumption that seed of watermelon would be a non-traded commodity.

Seedling of Grape

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/unit	6.00	-	-	-
Standard conversion factor		0.86	-	-	-
Estimated farm gate price	DH/unit	5.16	-	-	-

Note: - The standard conversion factor has been applied on the assumption that seedling of grape would be a non-traded commodity.

Annual Replacement Cost of Olive

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/ha	140	140	140	140
Standard conversion factor		0.86	0.86	0.86	0.86
Estimated farm gate price	DH/kg	120	120	120	120

Note: - The standard conversion factor has been applied on the assumption that a nursery tree of olive would be a non-traded commodity.

Seed of Broad Bean

	Unit	N'fifikh	Taskourt	Timkit	Azghar
FOB Casablanca	DH/ton	10,020	10,020	-	10,020
Loading and port charges	DH/ton	129	129	-	129
Collection/transportation	DH/ton	46	135	-	156
Estimated farm gate price	DH/ton	9,845	9,756	-	9,735
Actual farm gate price	DH/ton	10,000	10,000	-	10,000
Conversion factor		0.98	0.98	-	0.97

Note: - FOB Casablanca is estimated based on statistical data of export volume and value kept by Office of Change, Morocco
- FOB Casablanca is an average price of five years from 1995 to 1999
- Loading, port charges, collection, and transportation costs have been converted into economic value by using the standard conversion factor of 0.86.

Table XVIII2.1.2: Calculation of Economic Price of Agricultural Crops and Inputs (5/5)
(With Project)

Seedling of Date

	Unit	N'fifikh	Taskourt	Timkit	Azghar
Actual farm gate price	DH/tree	-	-	170	-
Standard conversion factor		-	-	0.86	-
Estimated farm gate price	DH/tree	-	-	146	-

Note: - The standard conversion factor has been applied on the assumption that seedling of date would be a non-traded commodity.

Seed of Fodder

	Unit	Alfalfa	Barley	Straw of cereals
Actual farm gate price	DH/kg	360.00	4.00	-
Standard conversion factor		0.86	0.86	-
Estimated farm gate price	DH/kg	309.60	3.44	-

Note: - The standard conversion factor has been applied on the assumption that seed of fodder would be a non-traded commodity.

Fertilizer

	Unit	Urea (46%N)	TSP (45%P2O5)	P. Chloride (60%K2O)	Other fertilizer	Agricultural chemical
FOB at point of export	US$/ton	91	144	113		
Freight and insurance	US$/ton	23	23	23		
CIF Casablanca	US$/ton	114	167	136		
CIF Casablanca	DH/ton	1,218	1,784	1,452		
(Exchange rate: US$1 = 10.68 DH)					Average of	Average of
Landing and port charges	DH/ton	129	129	129	fertilizer	fertilizer
Transportation/distribution	DH/ton	46	46	46		
Import parity value	DH/ton	1,393	1,959	1,628		
Actual market price	DH/ton	1,639	1,947	2,280		
Conversion factor		0.85	1.01	0.71	0.85	0.85

Note: - FOB at point of export: World Bank Commodity Price Data, January 2001
- FOB at point of export is an average price of three years from Jan 1998 to December 2000
- Landing, port charges, transportation, and distribution costs have been converted into economic value by using the standard conversion factor of 0.86.
- The conversion factor for agricultural chemical is assumed as an average of fertilizers.

Table XVIII2.2.1: Alternative Plans Subject to Economic Evaluation

Project	Alternative	Dam (Annual water resources development)	Irrigation type	Net irrigable area with 80% probability (ha)	Net irrigable area with 20% probability (ha)	Annual average irrigable area (ha)	Net irrigation development area (ha)	Gross irrigation development area (ha)	Applied cropping pattern	Remarks
a	b	c	d	e	f	g	h	I	j	k
N'fifikh (upstream)	**NU1**	Proposed plan (6.4 Mm3)	Gravity: 100 %	780	1,000	853	1,000	1,250	Improved cropping pattern proposed by JICA team	
	NU2	- ditto -	- ditto -	810	1,030	886	1,030	1,290	Existing cropping pattern	
	NU3	- ditto -	- ditto -	590	740	645	1,000	1,250	To enhance vegetable cultivation	
	NU4	- ditto -	Gravity: 50 % Mechanical: 50 %	900	1,170	984	1,170	1,460	Improved cropping pattern proposed by JICA team	
	NU5	- ditto -	Gravity 100% with pump	780	1,000	853	1,000	1,250	Improved cropping pattern proposed by JICA team	To irrigate farmlands on the left bank just downstream of the dam
N'fifikh (downstream)	**ND1**	Intake weir and pumping station	Mechanical: 100 % with pump	210	260	228	260	330	Improved cropping pattern proposed by JICA team	Mechanical irrigation only.
	ND2	Small dam at proposed weir location	Mechanical: 100 % with pump	470	590	510	590	740	- ditto -	- ditto -
Taskourt	**TA1**	Proposed plan (36 Mm3)	Gravity: 100 %	3,530	4,500	3,831	4,500	6,000	Improved cropping pattern proposed by JICA team	Perennial: 900 ha Seasonal: remaining area
	TA2	- ditto -	Gravity: 50 % Mechanical: 50 %	4,060	5,100	4,406	5,100	6,000	- ditto -	- ditto -
	TA3	Small dam (24 Mm3)	Gravity: 100 %	2,500	3,150	2,713	4,500	6,000	- ditto -	- ditto -
	TA4	- ditto -	Gravity: 50 % Mechanical: 50 %	2,880	3,620	3,126	4,500	6,000	- ditto -	- ditto -
Timkit	**TI1**	Proposed plan	Gravity: 100% with pump wells	1,110 + 240 in Ifegh	-	1,450 +240 in Ifegh	3,060	3,825	Improved cropping pattern proposed by JICA team	To irrigate farmlands with sub-surface and surface water except Ifegh irrigated by surface water.
	TI2	- ditto -	- ditto -	1,460 +240 in Ifegh	-	1,330 +240 in Ifegh	3,060	3,825	- ditto -	To irrigate farmlands with sub-surface water except Ifegh irrigated by surface water.
Azghar	**AZ1**	Proposed plan (14.6 Mm3)	Gravity: 100 %	2,000	-	2,000	2,000	2,350	Improved cropping pattern proposed by JICA team	Negative benefit will be taken into account.

Table XVIII2.2.2: Estimated Farm Income under Present Condition (Without Project) (1/2)
(Economic Price, DH/ha)

N'fifikh (upstream area)

Crops		Benefit					Expenditure		Net
		Occupancy (%) a	Yield Qty. b	Yield Unit	Unit price (DH/kg) c	Benefit (DH) d=a*b*c	Unit cost (DH/ha) e	Net cost (DH) f=e*a	Benefit (DH) g=d-f
Cereals 1	Soft wheat	45.5	1.43	(ton/ha)	1.41	920	1,741	792	128
Cereals 2	Hard wheat	30.0	1.14	(ton/ha)	1.56	535	1,908	573	-38
Fodder	Barley	4.6	1,297	UF	2.58	152	1,269	58	94
Legume	Broad bean	4.6	0.66	(ton/ha)	3.38	102	2,068	94	8
Vegetable	Potato	1.8	27.3	(ton/ha)	1.77	880	11,436	208	672
Tree Crop	Grape	4.6	0.84	(ton/ha)	2.51	96	2,622	119	-23
Fodder from cereal 1	-	45.5	725	UF	2.58	851	-	-	851
Fodder from cereal 2	-	30.0	593	UF	2.58	459	-	-	459
Fallow	-	9.0	500	UF	2.58	116	-	-	116
Total		175.5				4,111		1,844	2,267

N'fifikh (downstream area)

Crops		Benefit					Expenditure		Net
		Occupancy (%) a	Yield Qty. b	Yield Unit	Unit price (DH/kg) c	Benefit (DH) d=a*b*c	Unit cost (DH/ha) e	Net cost (DH) f=e*a	Benefit (DH) g=d-f
Cereals 1	Soft wheat	50.7	1.3	(ton/ha)	1.41	932	2,623	1,330	-398
Cereals 2	Barley	11.7	1.2	(ton/ha)	1.01	142	1,685	197	-55
Fodder1	Barley	3.9	1,775	UF	2.58	179	1,704	66	113
Vegetable	Potato	3.9	15.1	(ton/ha)	1.77	1,044	16,066	627	417
Tree Crop	Grape	7.8	5	(ton/ha)	2.51	979	2,622	205	774
Fodder from cereal 1	-	50.7	659	UF	2.58	862	-	-	862
Fodder from cereal 2	-	11.7	608	UF	2.58	184	-	-	184
Fallow	-	22.0	500	UF	2.58	284	-	-	284
Total		162.4				4,606		2,425	2,181

Taskourt (Perennial Irrigation Area)

Crops		Benefit					Expenditure		Net
		Occupancy (%) a	Yield Qty. b	Yield Unit	Unit price (DH/kg) c	Benefit (DH) d=a*b*c	Unit cost (DH/ha) e	Net cost (DH) f=e*a	Benefit (DH) g=d-f
Cereals 1	Soft wheat	33	2.6	(ton/ha)	1.50	1,287	1,384	457	830
Cereals 2	Barley	33	1.8	(ton/ha)	1.10	653	1,259	415	238
Fodder	Alfalfa	5	8,615	UF	4.47	1,925	3,362	168	1,757
Legume	Broad bean	2	6.3	(ton/ha)	3.33	419	2,134	43	376
Vegetable 1	Watermelon	8	25	(ton/ha)	3.44	6,880	9,710	777	6,103
Vegetable 2	Potato	4	8.75	(ton/ha)	1.75	614	9,710	388	226
Tree Crop 1	Olive	15	4.8	(ton/ha)	2.25	1,616	2,360	354	1,262
Fodder from cereal 1	-	33	1,000	UF	2.58	851	-	-	851
Fodder from cereal 2	-	33	913	UF	2.58	777	-	-	777
Total		166				15,022		2,602	12,420

Taskourt (Seasonal and Flood Irrigation Area)

Crops		Benefit					Expenditure		Net
		Occupancy (%) a	Yield Qty. b	Yield Unit	Unit price (DH/kg) c	Benefit (DH) d=a*b*c	Unit cost (DH/ha) e	Net cost (DH) f=e*a	Benefit (DH) g=d-f
Cereals 1	Soft wheat	41	0.27	(ton/ha)	1.50	166	1,384	567	-401
Cereals 2	Barley	45	0.28	(ton/ha)	1.10	139	1,259	567	-428
Tree Crop 1	Olive	5	0.72	(ton/ha)	2.25	81	2,360	118	-37
Tree Crop 2	Almond	5	0.34	(ton/ha)	41.49	705	1,253	63	642
Fodder from cereal 1	-	41	137	UF	2.58	145	-	-	145
Fodder from cereal 2	-	45	142	UF	2.58	165	-	-	165
Fallow	-	4	500	UF	2.58	52	-	-	52
Total		186				1,453		1,315	138

Table XVIII2.2.2: Estimated Farm Income under Present Condition (Without Project) (2/2)
(Economic Price, DH/ha)

Timkit (Ifegh)

Crops		Benefit					Expenditure		Net
		Occupancy (%) a	Yield Qty. b	Yield Unit	Unit price (DH/kg) c	Benefit (DH) d=a*b*c	Unit cost (DH/ha) e	Net cost (DH) f=e*a	Benefit (DH) g=d-f
Cereals 1	Hard wheat	33.6	2.8	(ton/ha)	1.88	1,769	2,222	747	1,022
Cereals 2	Barley	38.4	1.7	(ton/ha)	1.33	868	1,259	483	385
Fodder	Alfalfa	11.5	5,892	UF	4.47	3,034	3,846	443	2,591
Vegetable	Potato	2.9	26	(ton/ha)	2.01	1,530	4,728	136	1,394
Tree Crop 1	Dates	7.7	1.4	(ton/ha)	6.88	734	1,977	152	582
Tree Crop 2	Olive	1.9	2.1	(ton/ha)	2.31	93	3,846	74	19
Fodder from cereal 1	-	33.6	1,000	UF	2.58	867	-	-	867
Fodder from cereal 2	-	38.4	858	UF	2.58	850	-	-	850
Total		168.0				9,745		2,035	7,710

Timkit (Tinejdad)

Crops		Benefit					Expenditure		Net
		Occupancy (%) a	Yield Qty. b	Yield Unit	Unit price (DH/kg) c	Benefit (DH) d=a*b*c	Unit cost (DH/ha) e	Net cost (DH) f=e*a	Benefit (DH) g=d-f
Cereals 1	Hard wheat	50.4	2.8	(ton/ha)	1.88	2,653	2,222	1,120	1,533
Fodder	Alfalfa	12.6	5,846	UF	4.47	3,293	3,846	485	2,808
Vegetable	Potato	4.2	27.6	(ton/ha)	2.01	2,332	4,728	199	2,133
Tree Crop 1	Dates	15.12	1.33	(ton/ha)	6.88	1,384	1,977	299	1,085
Tree Crop 2	Olive	1.68	2.1	(ton/ha)	2.31	82	3,846	65	17
Fodder from cereal 1	-	50.4	1,000	UF	2.58	1,300	-	-	1,300
Total		134.4				11,044		2,168	8,876

Timkit (Chtam)

Crops		Benefit					Expenditure		Net
		Occupancy (%) a	Yield Qty. b	Yield Unit	Unit price (DH/kg) c	Benefit (DH) d=a*b*c	Unit cost (DH/ha) e	Net cost (DH) f=e*a	Benefit (DH) g=d-f
Cereals 1	Hard wheat	7	2.8	(ton/ha)	1.88	368	2,222	156	212
Fodder	Alfalfa	4.2	5,846	UF	4.47	1,098	3,846	162	936
Vegetable	Potato	2.8	27.6	(ton/ha)	2.01	1,555	4,728	132	1,423
Fodder from cereal 1	-	7	1,000	UF	2.58	181	-	-	181
Total		21				3,202		450	2,752

Azghar

Crops		Benefit					Expenditure		Net
		Occupancy (%) a	Yield Qty. b	Yield Unit	Unit price (DH/kg) c	Benefit (DH) d=a*b*c	Unit cost (DH/ha) e	Net cost (DH) f=e*a	Benefit (DH) g=d-f
Cereals 1	Hard wheat	28.7	0.47	(ton/ha)	1.67	225	1,883	540	-315
Cereals 2	Barley	32.8	0.68	(ton/ha)	1.12	250	1,684	552	-302
Fodder	Barley	4.1	473	UF	2.58	50	1,742	71	-21
Legume	Broad bean	4.1	0.21	(ton/ha)	3.21	28	1,795	74	-46
Tree Crop	Olive	12.3	0.84	(ton/ha)	2.61	270	1,373	169	101
Fodder from cereal 1	-	28.7	238	UF	2.58	176	-	-	176
Fodder from cereal 2	-	32.8	402	UF	2.58	340	-	-	340
Fallow	-	18.0	500	UF	2.58	232	-	-	232
Total		161.5				1,571		1,406	165

Table XVIII2.2.3: Breakdown of Crop Production Cost under Present Condition (without Project) (1/6)
(Financial & Economic Price, DH/ha)

N'fifikh (Upstream Area)

Soft wheat	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	Unit				-	-
Leveling	Unit	1.0	250	0.86	215	215
Crop covering (machine)	Unit	1.0	150	0.86	129	129
Harvest	Unit	1.0	200	0.86	172	172
Baling	Bale	135.0	1.5	0.86	1.3	174
Packing of grain	Unit	13.0	2	0.86	1.7	22
Transportation	100kg	13.0	5	0.86	4.3	56
Agricultural input materials						
Seed	100kg	2.0	350	0.86	301	602
Manure	ton	-	-	-	-	-
Fertilizer (1)	100kg	0.5	250	0.85	213	106
Fertilizer (2)	100kg	0.5	150	0.85	128	64
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	1.0	75	0.85	64	64
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	1.0	40	0.86	34	34
Seeding/ seedling	day	1.0	40	0.86	34	34
Treatment/Maintenance	day	2.0	40	0.86	34	69
Harvest	day	-	-	-	-	-
Total						1,741

N'fifikh (Upstream Area)

Hard wheat	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	Unit	-	-	-	-	-
Leveling	Unit	1.0	250	0.86	215	215
Crop covering (machine)	Unit	1.0	150	0.86	129	129
Harvest	Unit	1.0	200	0.86	172	172
Baling	Bale	135.0	1.5	0.86	1.3	174
Packing of grain	Unit	18.0	2.5	0.86	2.2	39
Transportation	100kg	20.0	5.0	0.86	4.3	86
Agricultural input materials						
Seed	100kg	2.0	300	0.86	258	516
Manure	ton	-	-	-	-	-
Fertilizer (1)	100kg	1.0	250	0.85	213	213
Fertilizer (2)	100kg	1.0	150	0.85	128	128
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	1.0	75	0.85	64	64
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	1.0	40	0.86	34	34
Seeding/ seedling	day	2.0	40	0.86	34	69
Treatment/Maintenance	day	2.0	40	0.86	34	69
Harvest	day	-	-	-	-	-
Total						1,908

N'fifikh (Upstream Area)

Fodder barley	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	Unit					
Leveling	Unit	1.0	250	0.86	215	215
Crop covering (machine)	Unit	1.0	150	0.86	129	129
Harvest	Unit	1.0	150	0.86	129	129
Baling	Bale	170.0	1.5	0.86	1.3	219
Transportation	Bale	170.0	0.3	0.86	0.3	44
Agricultural input materials						
Seed	100kg	2.5	200	0.86	172	430
Manure	ton	-	-	-	-	-
Fertilizer (1)	100kg	-	-	-	-	-
Fertilizer (2)	100kg	-	-	-	-	-
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	-	-	-	-	-
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	-	-	-	-	-
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	3.0	40	0.86	34	103
Harvest	day	-	-	-	-	-
Total						1,269

N'fifikh (Upstream Area)

Broad Bean	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	Unit	1.0	250	0.86	215	215
Leveling	Unit	-	-	-	-	-
Crop covering (machine)	Unit	1.0	150	0.86	129	129
Harvest	Unit	-	-	-	-	-
Baling	Bale	-	-	-	-	-
Packing of grain	Unit	-	-	-	-	-
Transportation	ton	-	-	-	-	-
Agricultural input materials						
Seed	kg	100.0	10	0.86	9	860
Manure	ton	-	-	-	-	-
Fertilizer (1) 14-28-14	100kg	0.5	250	0.85	213	106
Fertilizer (2)	100kg	-	-	-	-	-
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	-	-	-	-	-
Labor Force						
Cultivation	day	4.0	40	0.86	34	138
Fertilization	day	2.0	40	0.86	34	69
Seeding/ seedling	day	2.0	40	0.86	34	69
Treatment/Maintenance	day	4.0	40	0.86	34	138
Harvest	day	5.0	40	0.86	34	172
Transportation	day	5.0	40	0.86	34	172
Total						2,068

N'fifikh (Upstream Area)

Potato	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	Unit	1.0	300	0.86	258	258
Leveling	Unit	1.0	150	0.86	129	129
Crop covering (machine)	Unit	1.0	150	0.86	129	129
Harvest	Unit	-	-	-	-	-
Baling	Bale	-	-	-	-	-
Packing of grain	Unit	-	-	-	-	-
Transportation	ton	25.0	12	0.86	10	258
Pump irrigation	m3	2,400	0.5	0.86	0.4	1,032
Agricultural input materials						
Seed	100kg	2.2	4,000	0.86	3,440	7,568
Manure	ton	-	-	-	-	-
Fertilizer (1)	100kg	1.0	250	0.85	213	213
Fertilizer (2)	100kg	2.0	100	0.85	85	170
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	3.0	200	0.85	170	510
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	7.0	40	0.86	34	241
Seeding/ seedling	day	3.0	40	0.86	34	103
Treatment/Maintenance	day	16.0	40	0.86	34	550
Harvest	day	8.0	40	0.86	34	275
Total						11,436

N'fifikh (Upstream Area)

Grape	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	Unit	2.0	150	0.86	129	258
Leveling	Unit	-	-	-	-	-
Crop covering (machine)	Unit	-	-	-	-	-
Transport	ton	10.0	10.0	0.86	8.6	86
Irrigation	m3	-	-	-	-	-
Supporter	Unit	10.0	50	0.86	43	430
Treatment	Unit	0.5	500	0.86	430	215
Agricultural input materials						
Seed	100kg	-	-	-	-	-
Manure	ton	-	-	-	-	-
Fertilizer (1)	100kg	3.0	240	0.85	204	612
Fertilizer (2)	100kg	-	-	-	-	-
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	Unit	0.5	500	0.85	425	213
Fuel	liter	-	-	-	-	-
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	3.0	40	0.86	34	103
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	8.0	40	0.86	34	275
Harvest	day	12.5	40	0.86	34	430
Total						2,622

Table XVIII2.2.3: Breakdown of Crop Production Cost under Present Condition (without Project) (2/6)
(Financial & Economic Price, DH/ha)

N'fifikh (Downstream Area)

Soft wheat	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	Unit	1.0	250	0.86	215	215
Leveling	Unit	-	-	-	-	-
Crop covering (machine)	Unit	2.0	150	0.86	129	258
Harvest	Unit	1.0	400	0.86	344	344
Baling	Unit	-	-	-	-	-
Agricultural input materials						
Seed	100kg	2.0	400	0.86	344	688
Manure	ton	-	-	-	-	-
Fertilizer (1)	100kg	2.0	255	0.85	217	434
Fertilizer (2)	100kg	1.0	240	0.85	204	204
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	-	-	-	-	-
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	1.0	40	0.86	34	34
Seeding/ seedling	day	1.0	40	0.86	34	34
Treatment/Maintenance	day	6.0	40	0.86	34	206
Harvest	day	6.0	40	0.86	34	206
Total						2,623

N'fifikh (Downstream Area)

Barley	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	Unit	1.0	250	0.86	215	215
Leveling	Unit	-	-	-	-	-
Crop covering (machine)	Unit	1.0	150	0.86	129	129
Harvest	Unit	1.0	400	0.86	344	344
Baling	Unit	-	-	-	-	-
Agricultural input materials						
Seed	100kg	1.5	300	0.86	258	387
Manure	ton	-	-	-	-	-
Fertilizer (1)	100kg	1.5	250	0.85	213	319
Fertilizer (2)	100kg	0.5	200	0.85	170	85
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	-	-	-	-	-
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	1.0	40	0.86	34	34
Seeding/ seedling	day	1.0	40	0.86	34	34
Treatment/Maintenance	day	-	-	-	-	-
Harvest	day	4.0	40	0.86	34	138
Total						1,685

N'fifikh (Downstream Area)

Fodder barley	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	Unit	1.0	250	0.86	215	215
Leveling	Unit	-	-	-	-	-
Crop covering (machine)	Unit	1.0	150	0.86	129	129
Ridging	Unit	-	-	-	-	-
Baling	Unit	1.0	150	0.86	129	129
Other	Unit	1.0	200	0.86	172	172
Agricultural input materials						
Seed	100kg	1.5	480	0.86	413	619
Manure	ton	-	-	-	-	-
Fertilizer (1)	100kg	1.0	255	0.85	217	217
Fertilizer (2)	100kg	-	-	-	-	-
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	-	-	-	-	-
Chemicals	kg	-	-	-	-	-
Fuel	liter	-	-	-	-	-
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	0.5	40	0.86	34	17
Seeding/ seedling	day	1.0	40	0.86	34	34
Treatment/Maintenance	day	-	-	-	-	-
Harvest	day	5.0	40	0.86	34	172
Total						1,704

N'fifikh (Downstream Area)

Potato	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	Unit	1.0	250	0.86	215	215
Leveling	Unit	-	-	-	-	-
Crop covering (machine)	Unit	-	-	-	-	-
Ridging	Unit	1.0	150	0.86	129	129
Harvest	Unit	-	-	-	-	-
Baling	Unit	-	-	-	-	-
Agricultural input materials						
Seed	100kg	2.0	4,000	0.86	3,440	6,880
Fertilizer (1)	100kg	11.5	283	0.85	241	2,766
Fertilizer (2)	100kg	3.5	185	0.85	157	550
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	3.0	300	0.85	255	765
Chemicals	kg	7.0	200	0.85	170	1,190
Fuel	liter	128.0	5.0	0.85	4.3	544
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	5.0	40	0.86	34	172
Seeding/ seedling	day	15.0	40	0.86	34	516
Treatment/Maintenance	day	45.0	40	0.86	34	1,548
Harvest	day	23.0	40	0.86	34	791
Total						16,066

N'fifikh (Upstream Area)

Grape	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	Unit	2.0	150	0.86	129	258
Leveling	Unit	-	-	-	-	-
Crop covering (machine)	Unit	-	-	-	-	-
Transport	ton	10.0	10.0	0.86	8.6	86
Irrigation	m3	-	-	-	-	-
Supporter	Unit	10.0	50	0.86	43	430
Treatment	Unit	0.5	500	0.86	430	215
Agricultural input materials						
Seed	100kg	-	-	-	-	-
Manure	ton	-	-	-	-	-
Fertilizer (1)	100kg	3.0	240	0.85	204	612
Fertilizer (2)	100kg	-	-	-	-	-
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	Unit	0.5	500	0.85	425	213
Fuel	liter	-	-	-	-	-
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	3.0	40	0.86	34	103
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	8.0	40	0.86	34	275
Harvest	day	12.5	40	0.86	34	430
Total						2,622

Table XVIII2.2.3: Breakdown of Crop Production Cost under Present Condition (without Project) (3/6)
(Financial & Economic Price, DH/ha)

Taskourt (Perennial, Seasonal, and Flood Irrigation Areas)

Soft wheat	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	day	0.7	110	0.86	95	63
Plowing (animal)	day	-	-	-	-	-
Leveling	day	-	-	-	-	-
Crop covering (machine)	day	1.0	90	0.86	77	77
Crop covering (animal)	day	-	-	-	-	-
Harvest	day	0.3	100	0.86	86	28
Baling	day	-	-	-	-	-
Agricultural input materials						
Seed	100kg	1.0	330	0.86	284	284
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	0.3	230	0.85	196	66
Fertilizer (Urea)	100kg	0.3	230	0.85	196	53
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (24D)	liter	-	-	-	-	-
Labor Force						-
Cultivation	day	1.7	40	0.86	34	57
Fertilization	day	1.0	40	0.86	34	34
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	5.0	40	0.86	34	172
Harvest	day	16.0	40	0.86	34	550
Total						1,384

Taskourt (Perennial, Seasonal, and Flood Irrigation Areas)

Barley	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	day	0.4	100	0.86	86	30
Plowing (animal)	day	0.3	70	0.86	60	15
Leveling	day	-	-	-	-	-
Crop covering (machine)	day	0.8	100	0.86	86	65
Crop covering (animal)	day	-	-	-	-	-
Threshing	day	0.2	50	0.86	43	7
Baling	day	-	-	-	-	-
Agricultural input materials						
Seed	Unit	1.0	220	0.86	189	189
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	0.3	230	0.85	196	59
Fertilizer (Urea)	100kg	0.1	230	0.85	196	10
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (24D)	liter	0.0	35	0.85	30	1
Labor Force						
Cultivation	day	2.2	40	0.86	34	76
Fertilization	day	1.8	40	0.86	34	62
Seeding/ seedling	day	0.5	40	0.86	34	17
Treatment/Maintenance	day	6.7	40	0.86	34	229
Harvest	day	14.5	40	0.86	34	499
Total						1,259

Taskourt (Perennial Irrigation Area)

Alfalfa	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	day	-	-	-		-
Plowing (animal)	day	0.2	70	0.86	60	12
Leveling	day	0.2	60	0.86	52	10
Crop covering (machine)	day	0.2	50	0.86	43	9
Crop covering (animal)	day	-	-	-	-	-
Ridging	day	-	-	-	-	-
Harvest (Transport)	day	1.0	300	0.86	258	258
Agricultural input materials						
Seed	100kg	0.1	3,000	0.86	2,580	129
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	-	-	-	-	-
Fertilizer (Urea)	100kg	4.5	230	0.85	196	880
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (24D)	liter	-	-	-	-	-
Labor Force						
Cultivation	day	3.0	40	0.86	34	103
Fertilization	day	15.0	40	0.86	34	516
Seeding/ seedling	day		-	-	-	-
Treatment/Maintenance	day	12.0	40	0.86	34	413
Harvest	day	30.0	40	0.86	34	1,032
Total						3,362

Taskourt (Perennial Irrigation Area)

Broad bean	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	day	0.4	110	0.86	95	38
Plowing (animal)	day	0.8	70	0.86	60	48
Leveling	day	-	-	-	-	-
Crop covering (machine)	day	0.1	90	0.86	77	8
Crop covering (animal)	day	0.9	70	0.86	60	54
Ridging	day	-	-	-	-	-
Baling	day	-	-	-	-	-
Agricultural input materials						
Seed	100kg	0.8	500	0.86	430	344
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	1.0	230	0.85	196	196
Fertilizer (Urea)	100kg	-	-	-	-	-
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (24D)	liter	-	-	-	-	-
Labor Force						
Cultivation	day	9.0	40	0.86	34	310
Fertilization	day	7.0	40	0.86	34	241
Seeding/ seedling	day	4.0	40	0.86	34	138
Treatment/Maintenance	day	4.0	40	0.86	34	138
Harvest	day	18.0	40	0.86	34	619
Total						2,134

Taskourt (Perennial Irrigation Area)

Watermelon	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	day	-	-	-	-	-
Plowing (animal)	day	1.0	70	0.86	60	60
Leveling	day	-	-	-	-	-
Crop covering (machine)	day	-	-	-	-	-
Crop covering (animal)	day	1.0	60	0.86	52	52
Ridging	day	0.5	50	0.86	43	22
Baling	day	-	-	-	-	-
Agricultural input materials						
Seed	kg	7.5	350	0.86	301	2,258
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	-	-	-	-	-
Fertilizer (Urea)	100kg	3.4	230	0.85	196	665
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (24D)	liter	-	-	-	-	-
Labor Force						
Cultivation	day	13.0	40	0.86	34	447
Fertilization	day	30.4	40	0.86	34	1,046
Seeding/ seedling	day	70.0	40	0.86	34	2,408
Treatment/Maintenance	day	40.0	40	0.86	34	1,376
Harvest	day	40.0	40	0.86	34	1,376
Total						9,710

Taskourt (Perennial Irrigation Area)

Potato	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	day	-	-	-	-	-
Plowing (animal)	day	1.0	70	0.86	60	60
Leveling	day	-	-	-	-	-
Crop covering (machine)	day	-	-	-	-	-
Crop covering (animal)	day	1.0	60	0.86	52	52
Ridging	day	0.5	50	0.86	43	22
Baling	day	-	-	-	-	-
Agricultural input materials						
Seed	100kg	7.5	350	0.86	301	2,258
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	-	-	-	-	-
Fertilizer (Urea)	100kg	3.4	230	0.85	196	665
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (24D)	liter	-	-	-	-	-
Labor Force						
Cultivation	day	13.0	40	0.86	34	447
Fertilization	day	30.4	40	0.86	34	1,046
Seeding/ seedling	day	70.0	40	0.86	34	2,408
Treatment/Maintenance	day	40.0	40	0.86	34	1,376
Harvest	day	40.0	40	0.86	34	1,376
Total						9,710

Table XVIII2.2.3: Breakdown of Crop Production Cost under Present Condition (without Project) (4/6)
(Financial & Economic Price, DH/ha)

Taskourt (Perennial, Seasonal, and Flood Irrigation Areas)

Olive	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	day	-	-	-	-	-
Plowing (animal)	day	-	-	-	-	-
Leveling	day	-	-	-	-	-
Crop covering (machine)	day	-	-	-	-	-
Crop covering (animal)	day	-	-	-	-	-
Ridging	day	-	-	-	-	-
Harvest (Transport)	day	-	-	-	-	-
Agricultural input materials						
Seed	100kg	-	-	-	-	-
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	-	-	-	-	-
Fertilizer (Urea)	100kg	0.3	230	0.85	196	59
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (24D)	Unit	0.1	120	0.85	102	10
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	23.4	40	0.86	34	805
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	19.2	40	0.86	34	660
Harvest	day	24.0	40	0.86	34	826
Total						2,360

Taskourt (Seasonal and Flood Irrigation Areas)

Almond	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	day	-	-	-	-	-
Plowing (animal)	day	-	-	-	-	-
Leveling	day	-	-	-	-	-
Crop covering (machine)	day	-	-	-	-	-
Crop covering (animal)	day	-	-	-	-	-
Ridging	day	-	-	-	-	-
Harvest (Transport)	day	-	-	-	-	-
Agricultural input materials						
Seed	100kg	-	-	-	-	-
Manure	ton	-	-	-	-	-
Fertilizer ((NH4)2SO4)	100kg	2.0	150	0.85	128	255
Fertilizer (Urea)	100kg	-	-	-	-	-
Fertilizer (3)	100kg	-	-	-	-	-
Maintenance	Unit	2.0	150	0.86	129	258
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	2.0	40	0.86	34	69
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	7.0	40	0.86	34	241
Harvest	day	12.5	40	0.86	34	430
Total						1,253

Timkit (Ifegh, Tinejdad, and Chtam)

Hard wheat	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing	hour	2.0	56	0.86	48	96
Leveling	hour	-	-	-	-	-
Crop covering	hour	1.0	56	0.86	48	48
Harvest	hour	4.0	96	0.86	83	330
Baling	hour	-	-	-	-	-
Agricultural input materials						
Seed	100kg	1.2	385	0.86	331	397
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	0.8	212	0.85	180	135
Fertilizer (Urea)	100kg	0.5	190	0.85	162	81
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	-	-	-	-	-
Labor Force						
Cultivation	day	3.0	40	0.86	34	103
Fertilization	day	1.0	40	0.86	34	34
Seeding/ seedling	day	2.0	40	0.86	34	69
Treatment/Maintenance	day	27.0	40	0.86	34	929
Harvest	day	-	-	-	-	-
Total						2,222

Timkit (Ifegh)

Barley	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing	hour	2.0	56	0.86	48	96
Leveling	hour	-	-	-	-	-
Crop covering	hour	-	-	-	-	-
Harvest	hour	3.5	96	0.86	83	289
Baling	hour	-	-	-	-	-
Agricultural input materials						
Seed	100kg	1.2	180	0.86	155	186
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	-	-	-	-	-
Fertilizer (Urea)	100kg	-	-	-	-	-
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	-	-	-	-	-
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	-	-	-	-	-
Seeding/ seedling	day	2.0	40	0.86	34	69
Treatment/Maintenance	day	-	-	-	-	-
Harvest	day	18.0	40	0.86	34	619
Total						1,259

Timkit (Ifegh, Tinejdad, and Chtam)

Alfalfa	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Cultivation by machineries & animal						
Plowing	hour	3.0	56	0.86	48	144
Leveling	hour	-	-	-	-	-
Crop covering	hour	-	-	-	-	-
Harvest	hour	-	-	-	-	-
Baling	hour	-	-	-	-	-
Agricultural input materials						
Seed	Unit	0.2	3,000	0.86	2,580	516
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	0.5	212	0.85	180	90
Fertilizer (2)	100kg	-	-	-	-	-
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	-	-	-	-	-
Labor Force						
Cultivation	day	10.0	40	0.86	34	344
Fertilization	day	10.0	40	0.86	34	344
Seeding/ seedling	day	5.0	40	0.86	34	172
Treatment/Maintenance	day	-	-	-	-	-
Harvest	day	65.0	40	0.86	34	2,236
Total						3,846

Timkit (Ifegh, Tinejdad, and Chtam)

Potato	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Cultivation by machineries & animal						
Plowing	hour	3.0	56	0.86	48	144
Leveling	hour	-	-	-	-	-
Crop covering	hour	-	-	-	-	-
Harvest	hour	-	-	-	-	-
Baling	hour	-	-	-	-	-
Agricultural input materials						
Seed	Unit	1.0	1,500	0.86	1,290	1,290
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	3.0	212	0.85	180	541
Fertilizer (2)	100kg	-	-	-	-	-
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals	liter	-	-	-	-	-
Labor Force						-
Cultivation	day	9.0	40	0.86	34	310
Fertilization	day	5.0	40	0.86	34	172
Seeding/ seedling	day	2.0	40	0.86	34	69
Treatment/Maintenance	day	19.0	40	0.86	34	654
Harvest	day	45.0	40	0.86	34	1,548
Total						4,728

Table XVIII2.2.3: Breakdown of Crop Production Cost under Present Condition (without Project) (5/6)
(Financial & Economic Price, DH/ha)

Timkit (Ifegh and Tinejdad)

Dates (1st year)	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Cultivation by machineries & animal						
Plowing	hour	8.0	56	0.86	48	385
Leveling	hour	-	-	-	-	-
Agricultural input materials						
Seed	Unit	100.0	100	0.86	86	8,600
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	7.0	212	0.85	180	1,261
Labor Force						
Cultivation	day	30.0	40	0.86	34	1,032
Fertilization	day	90.0	40	0.86	34	3,096
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	-	-	-	-	-
Harvest	day	-	-	-	-	-
Total						14,374

Dates (2nd to 7th years)	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Cultivation by machineries & animal						
Agricultural input materials						
Fertilizer (14-28-14)	100kg	1.0	212	0.85	180	180
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	4.0	40	0.86	34	138
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	12.0	40	0.86	34	413
Harvest	day	-	-	-	-	-
Total						731

Dates (from 3rd year)	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Cultivation by machineries & animal						
Agricultural input materials						
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	2.0	212	0.85	180	360
Labor Force						0
Cultivation	day	-	-	-	-	-
Fertilization	day	4.0	40	0.86	34	138
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	12.0	40	0.86	34	413
Harvest	day	31.0	40	0.86	34	1,066
Total						1,977

Timkit (Ifegh and Tinejdad)

Olive (1st year)	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Cultivation by machineries & animal						
Plowing	hour	6.0	56	0.86	48	289
Leveling	hour	-	-	0.86	-	-
Agricultural input materials						
Seed	Unit	200.0	19	0.86	16	3,268
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	2.0	212	0.85	180	360
Labor Force						
Cultivation	day	20.0	40	0.86	34	688
Fertilization	day	10.0	40	0.86	34	344
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	8.0	40	0.86	34	275
Harvest	day	-	-	-	-	-
Total						5,224

Olive (2nd year)	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Cultivation by machineries & animal						-
Agricultural input materials						
	Unit					-
Fertilizer (14-28-14)	100kg	2.0	212	0.85	180	360
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	10.0	40	0.86	34	344
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	2.0	40	0.86	34	69
Harvest	day	-	-	-	-	-
Total						773

Olive (from 3rd year)	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Cultivation by machineries & animal						
Plowing	hour	3.0	56	0.86	48	144
Leveling	hour	-	-	-	-	-
Agricultural input materials						
Seed	Unit	0.2	3,000	0.86	2,580	516
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	0.5	212	0.85	180	90
Labor Force						
Cultivation	day	10.0	40	0.86	34	344
Fertilization	day	10.0	40	0.86	34	344
Seeding/ seedling	day	5.0	40	0.86	34	172
Treatment/Maintenance	day	-	-	-	-	-
Harvest	day	65.0	40	0.86	34	2,236
Total						3,846

Azghar

Hard wheat	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	ha	0.9	300	0.86	258	232
Plowing (animal)	ha	0.1	70	0.86	60	6
Leveling	ha	-	-	-	-	-
Crop covering (machine)	ha	0.9	150	0.86	129	116
Crop covering (animal)	ha	0.1	70	0.86	60	6
Harvest (machine)	day	0.9	350	0.86	301	271
Harvest (animal)	day	0.1	70	0.86	60	6
Baling	Bale	120.0	3.0	0.86	2.6	310
Transportation	100kg	120.0	0.5	0.86	0.4	52
Agricultural input materials						
Seed	100kg	1.3	390	0.86	335	436
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	1.0	250	0.85	213	213
Fertilizer (Urea)	100kg	0.5	153	0.85	130	65
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (2-4-D)	liter	1.0	40	0.85	34	34
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	1.0	40	0.86	34	34
Seeding/ seedling	day	1.0	40	0.86	34	34
Treatment/Maintenance	day	1.0	40	0.86	34	34
Harvest	day	1.0	40	0.86	34	34
						0
Total						1,883

Azghar

Barley	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	ha	0.9	300	0.86	258	232
Plowing (animal)	ha	0.1	70	0.86	60	6
Leveling	ha	-	-	-	-	-
Crop covering (machine)	ha	0.9	150	0.86	129	116
Crop covering (animal)	ha	0.1	70	0.86	60	6
Harvest (machine)	day	0.9	350	0.86	301	271
Harvest (animal)	day	0.1	70	0.86	60	6
Baling	Bale	120.0	3	0.86	3	310
Transportation	100kg	120.0	0.5	0.86	0.4	52
Agricultural input materials						
Seed	100kg	1.0	275	0.86	237	237
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	1.0	250	0.85	213	213
Fertilizer (Urea)	100kg	0.5	153	0.85	130	65
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (2-4-D)	liter	1.0	40	0.85	34	34
Labor Force						-
Cultivation	day	-	-	-	-	-
Fertilization	day	1.0	40	0.86	34	34
Seeding/ seedling	day	1.0	40	0.86	34	34
Treatment/Maintenance	day	1.0	40	0.86	34	34
Harvest	day	1.0	40	0.86	34	34
Total						1,684

Table XVIII2.2.3: Breakdown of Crop Production Cost under Present Condition (without Project) (6/6)
(Financial & Economic Price, DH/ha)

Azghar

Fodder barley	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	day	1.0	300	0.86	258	258
Plowing (animal)	day	-	-	-	-	-
Leveling	day	-	-	-	-	-
Crop covering (machine)	day	1.0	150	0.86	129	129
Crop covering (animal)	day	-	-	-	-	-
Harvest	day	1.0	200	0.86	172	172
Baling	Bale	100.0	4	0.86	3	344
Transportation	100kg	10.0	5	0.86	4	43
Agricultural input materials						
Seed	100kg	1.5	275	0.86	237	355
Manure	ton	-	-	-	-	-
Fertilizer (TSP)	100kg	1.0	250	1.01	253	253
Fertilizer ((NH4)2SO4)	100kg	0.5	200	0.85	170	85
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (2-4-D)	liter	-	-	-	-	-
Labor Force						
Cultivation	day		-	-	-	-
Fertilization	day	1.0	40	0.86	34	34
Seeding/ seedling	day	2.0	40	0.86	34	69
Treatment/Maintenance	day	-	-	-	-	-
Harvest	day	-	-	-	-	-
Total						1,742

Azghar

Broad bean	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	day	1.0	250	0.86	215	215
Plowing (animal)	day	-	-	-	-	-
Leveling	day	-	-	-	-	-
Crop covering (machine)	day	-	-	-	-	-
Crop covering (animal)	day	-	-	-	-	-
Harvest	day	-	-	-	-	-
Baling	Bale	-	-	-	-	-
Transportation	100kg	-	-	-	-	-
Agricultural input materials						
Seed	100kg	1.3	1,000	0.86	860	1,118
Manure	ton	-	-	-	-	-
Fertilizer (TSP)	100kg	1.0	220	1.01	222	222
Fertilizer ((NH4)2SO4)	100kg	-	-	-	-	-
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (2-4-D)	liter	-	-	-	-	-
Labor Force						
Cultivation	day	2.0	40	0.86	34	69
Fertilization	day	1.0	40	0.86	34	34
Seeding/ seedling	day	1.0	40	0.86	34	34
Treatment/Maintenance	day	-	-	-	-	-
Harvest	day	3.0	40	0.86	34	103
Total						1,795

Azghar

Olive	Unit	Qty.	Unit price (financial)	Cone. factor	Unit price (economic)	Cost
Machineries						
Plowing (machine)	day	-	-	-	-	-
Plowing (animal)	day	-	-	-	-	-
Leveling	day	-	-	-	-	-
Crop covering (machine)	day	-	-	-	-	-
Crop covering (animal)	day	-	-	-	-	-
Harvest	day	-	-	-	-	-
Baling	Bale	-	-	-	-	-
Transportation	100kg	9.0	5	0.86	4	39
Agricultural input materials						
Seed	100kg	-	-	-	-	-
Manure	ton	-	-	-	-	-
Fertilizer (14-28-14)	100kg	3.0	250	0.85	213	638
Fertilizer ((NH4)2SO4)	100kg	1.0	170	0.85	145	145
Fertilizer (3)	100kg	-	-	-	-	-
Chemicals (2-4-D)	liter	-	-	-	-	-
Labor Force						
Cultivation	day	-	-	-	-	-
Fertilization	day	2.0	40	0.86	34	69
Seeding/ seedling	day	-	-	-	-	-
Treatment/Maintenance	day	2.0	40	0.86	34	69
Harvest	day	12.0	40	0.86	34	413
Total						1,373

Table XVIII2.2.4: Net Income after Installtion of Irrigation Facilities (1/6)
(Financial and Economic Prices, Per Hectare)

N'fifikh (Upsteam and Dowastream) (Per Hectare)

Soft wheat	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grain	kg	4,000	2.54	0.56	1.41	5,656
2) Strow	UF	1,000	3.00	0.86	2.58	2,580
Sub-total						8,236
2. Production Cost						
1) Seed	kg	120	4.00	0.70	2.81	337
2) Manure	ton					
3) Fertilizer						
- Urea	kg	261	2.72	0.85	2.31	603
- TSP	kg	187	2.20	1.01	2.22	416
- K2SO4	kg	180	2.28	0.71	1.62	291
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	unit	1	239.00	0.86	205.54	206
- Animal Traction	day	5.0	40.00	0.86	34.40	172
- Baler	unit	1.0	159.00	0.86	136.74	137
6) Labor Force	day	23	40.00	0.86	34.40	791
7) Other	%	10				300
Sub-total						3,296
3. Net Income (1.- 2.)						4,940

N'fifikh (Upsteam) (Per Hectare)

Hard wheat	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grain	kg	4,000	2.54	0.62	1.56	6,256
2) Strow	UF	1,000	3.00	0.86	2.58	2,580
Sub-total						8,836
2. Production Cost						
1) Seed	kg	120	4.00	0.88	3.52	423
2) Manure	ton					
3) Fertilizer						
- Urea	kg	261	2.72	0.85	2.31	603
- TSP	kg	187	2.20	1.01	2.22	416
- K2SO4	kg	180	2.28	0.71	1.62	291
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	hr	1	239.00	0.86	205.54	206
- Animal Traction	day	5.0	40.00	0.86	34.40	172
- Baler	hr	1.0	159.00	0.86	136.74	137
6) Labor Force	day	23	40.00	0.86	34.40	791
7) Other	%	10				308
Sub-total						3,390
3. Net Income (1.- 2.)						5,446

N'fifikh (Upsteam) (Per Hectare)

Barley	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grain	kg	4,000	1.54	0.66	1.01	4,040
2) Strow	UF	1,000	3.00	0.86	2.58	2,580
Sub-total						6,620
2. Production Cost						
1) Seed	kg	120	4.00	0.85	3.40	408
2) Manure	ton					
3) Fertilizer						
- Urea	kg	261	2.72	0.85	2.31	603
- TSP	kg	187	2.20	1.01	2.22	416
- K2SO4	kg	180	2.28	0.71	1.62	291
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	hr	1	239.00	0.86	205.54	206
- Animal Traction	day	5.0	40.00	0.86	34.40	172
- Baler	hr	1.0	159.00	0.86	136.74	137
6) Labor Force	day	23	40.00	0.86	34.40	791
7) Other	%	10				307
Sub-total						3,374
3. Net Income (1.- 2.)						3,246

N'fifikh (Upsteam and Dowastream) (Per Hectare)

Fodder (Barley)	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grain and strow	UF	2,300	3.00	0.86	2.58	5,934
Sub-total						5,934
2. Production Cost						
1) Seed	ha	120	4.00	0.86	3.44	413
2) Manure	ton					
3) Fertilizer						
- Urea	kg	261	2.72	0.85	2.31	603
- TSP	kg	187	2.20	1.01	2.22	416
- K2SO4	kg	180	2.28	0.71	1.62	291
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	hr	1	239.00	0.86	205.54	206
- Animal Traction	day	5.0	40.00	0.86	34.40	172
- Baler	hr	1.0	159.00	0.86	136.74	137
6) Labor Force	day	23	40.00	0.86	34.40	791
7) Other	%	10				307
Sub-total						3,379
3. Net Income (1.- 2.)						2,555

N'fifikh (Upsteam and Dowastream) (Per Hectare)

Fodder (Alfalfa)	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Alfalfa	UF	10,500	5.20	0.86	4.47	46,956
Sub-total						46,956
2. Production Cost						
1) Seed	ha	1	360.00	0.86	309.60	310
2) Manure	ton					
3) Fertilizer						
- Urea	kg	100	2.72	0.85	2.31	231
- TSP	kg	300	2.20	1.01	2.22	667
- K2SO4	kg	200	2.28	0.71	1.62	324
4) Agriculture Chemicals	ha					
5) Mechanization						
- Tractor	hr					
- Animal Traction	day	19.0	40.00	0.86	34.40	654
- Baler	hr					
6) Labor Force	day	114	40.00	0.86	34.40	3,922
7) Other	%	10				611
Sub-total						6,719
3. Net Income (1.- 2.)						40,237

N'fifikh (Upsteam and Dowastream) (Per Hectare)

Potato	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Potato	kg	31,000	1.77	1.09	1.92	59,613
Sub-total						59,613
2. Production Cost						
1) Seed	kg	2000	3.50	1.15	4.03	8,050
2) Manure	ton					
3) Fertilizer						
- Urea	kg	196	2.72	0.85	2.31	453
- TSP	kg	200	2.20	1.01	2.22	444
- K2SO4	kg	240	2.28	0.71	1.62	389
4) Agriculture Chemicals	ha	1	200.00	0.85	170.00	170
5) Mechanization						
- Tractor	ha	1	497.00	0.86	427.42	427
- Animal Traction	day	19	40.00	0.86	34.40	654
- Baler	unit					
6) Labor Force	day	120	40.00	0.86	34.40	4,128
7) Other	%	15				2,207
Sub-total						16,922
3. Net Income (1.- 2.)						42,691

Table XVIII2.2.4: Net Income after Installtion of Irrigation Facilities (2/6)
(Financial and Economic Prices, Per Hectare)

N'fifikh (Upsteam and Dowastream) (Per Hectare)

Grapes	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grapes	kg	10,000	2.51	1.04	2.60	26,010
Sub-total						26,010
2. Production Cost						
1) Seed						
2) Manure	ton					
3) Fertilizer	ha					
- 12-24-12	kg	400	2.52	0.85	2.14	857
- TSP	kg					
- K2SO4	kg					
4) Agriculture Chemicals	ha	1	500.00	0.85	425.00	425
5) Mechanization						
- Tractor	ha	1	142.00	0.86	122.12	122
- Animal Traction	day					
- Other	ha	1	800.00	0.86	688.00	688
6) Labor Force	day	31	40.00	0.86	34.40	1,066
7) Other	%	20				632
Sub-total *2						3,790
3. Net Income (1.- 2.)						22,220

N'fifikh (Upsteam) (Per Hectare)

Olive	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Olive	kg	10,000	2.07	1.13	2.35	23,490
Sub-total						23,490
2. Production Cost						
1) Seed (lifetime: 30 years, replacement cost only)	unit	1	140	0.86	120	120
2) Manure	ton					
3) Fertilizer						
- Urea	kg	130	2.72	0.85	2.31	301
- TSP	kg	111	2.20	1.01	2.22	247
- K2SO4	kg	60	2.28	0.71	1.62	97
4) Agriculture Chemicals	ha	1	150.00	0.85	127.50	128
5) Mechanization						
- Tractor	ha					
- Animal Traction	day	12	40.00	0.86	34.40	413
- Baler	hr					
6) Labor Force	day	68	40.00	0.86	34.40	2,339
7) Other	%	15				547
Sub-total						4,192
3. Net Income (1.- 2.)						19,298

N'fifikh (Upsteam) (Per Hectare)

Broad Bean	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Broad bean	kg	15,000	3.93	0.8601	3.38	50,700
Sub-total						50,700
2. Production Cost						
1) Seed	kg	60	10.00	0.98	9.85	591
2) Manure	ton					
3) Fertilizer						
- Urea	kg	72	2.72	0.85	2.31	166
- TSP	kg	244	2.20	1.01	2.22	542
- K2SO4	kg	300	2.28	0.71	1.62	486
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	ha	1	378.00	0.86	325.08	325
- Animal Traction	day	21.0	40.00	0.86	34.40	722
- Baler	hr					
6) Labor Force	day	194	40.00	0.86	34.40	6,674
7) Other	%	10				955
Sub-total						10,504
3. Net Income (1.- 2.)						40,196

N'fifikh (Upsteam and Dowastream) (Per Hectare)

Tomato	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Tomato	kg	50,000	1.44	1.42	2.05	102,400
Sub-total						102,400
2. Production Cost						
1) Seed	kg	0.5	820	0.86	705	353
2) Manure	ton					
3) Fertilizer						
- Urea	kg	200	2.72	0.85	2.31	462
- TSP	kg	200	2.20	1.01	2.22	444
- K2SO4	kg	340	2.28	0.71	1.62	550
4) Agriculture Chemicals	ha	1	600.00	0.85	510.00	510
5) Mechanization						
- Tractor	ha	1	378.00	0.86	325.08	325
- Animal Traction	day	38.0	40.00	0.86	34.40	1,307
- Baler	hr					
6) Labor Force	day	200	40.00	0.86	34.40	6,880
7) Other	%	20				2,166
Sub-total						12,997
3. Net Income (1.- 2.)						89,403

N'fifikh (Dowastream) (Per Hectare)

Grape for new cultivation (Production cost only)	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1st year						
1) Plowing	pers.	1	800.00	0.86	688.00	688
2) Leveling	pers.	1	150.00	0.86	129.00	129
3) Crop covering	pers.	3	150.00	0.86	129.00	387
4) Staking	ha	1	400.00	0.86	344.00	344
5) Manure	ton				0.00	0
6) Fertilizer	100kg	4	240.00	0.85	204.00	816
7) Seedling	unit	2,000	6.00	0.86	5.16	10,320
8) Manpower	day	15	40.00	0.86	34.40	516
Total						13,200
2nd & 3rd year						
1) Maintenance work	pers.	2	150.00	0.86	129.00	258
2) Supporter	unit	2,000	1.50	0.86	1.29	2,580
3) Treatment	unit	1	500.00	0.86	430.00	430
4) Irrigation	m3	0	0.50	0.86	0.43	0
5) Manpower	day	9	40.00	0.86	34.40	310
6) Fertilizer	100kg	3	240.00	0.85	204.00	612
7) Cutting	day	2	40.00	0.86	34.40	69
Total						4,001

Taskourt (Perennial, Seasonal, and Flood Irrigation Areas) (Per Hectare)

Soft wheat	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grain	kg	4,000	2.89	0.52	1.50	6,011
2) Strow	UF	1,000	3.00	0.86	2.58	2,580
Sub-total						8,591
2. Production Cost						
1) Seed	kg	120	4.00	0.72	2.88	346
2) Manure	ton					
3) Fertilizer						
- Urea	kg	261	2.72	0.85	2.31	603
- TSP	kg	187	2.20	1.01	2.22	416
- K2SO4	kg	180	2.28	0.71	1.62	291
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	hr	1	239.00	0.86	205.54	206
- Animal Traction	day	5.0	40.00	0.86	34.40	172
- Baler	hr	1.0	159.00	0.86	136.74	137
6) Labor Force	day	23	40.00	0.86	34.40	791
7) Other	%	10				301
Sub-total						3,306
3. Net Income (1.- 2.)						5,286

Table XVIII2.2.4: Net Income after Installtion of Irrigation Facilities (3/6)
(Financial and Economic Prices, Per Hectare)

Taskourt (Seasonal and Flood Irrigation Areas) (Per Hectare)

Barley	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grain	kg	4,000	2.52	0.44	1.10	4,396
2) Strow	UF	1,000	3.00	0.86	2.58	2,580
Sub-total						6,976
2. Production Cost						
1) Seed	kg	120	4.00	0.87	3.49	418
2) Manure	ton					
3) Fertilizer						
- Urea	kg	261	2.72	0.85	2.31	603
- TSP	kg	187	2.20	1.01	2.22	416
- K2SO4	kg	180	2.28	0.71	1.62	291
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	hr	1	239.00	0.86	205.54	206
- Animal Traction	day	5.0	40.00	0.86	34.40	172
- Baler	hr	1.0	159.00	0.86	136.74	137
6) Labor Force	day	23	40.00	0.86	34.40	791
7) Other	%	10				308
Sub-total						3,385
3. Net Income (1.- 2.)						3,591

Taskourt (Seasonal and Flood Irrigation Areas) (Per Hectare)

Almond	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Almond	kg	3,500	48.24	0.86	41.49	145,201
Sub-total						145,201
2. Production Cost						
1) Seed (No new planting considered)						
2) Manure	ton					
3) Fertilizer	ha	1	848.00	0.85	720.80	721
- Urea						
- TSP						
- K2SO4						
4) Agriculture Chemicals	ha					
5) Mechanization						
- Tractor	hr					
- Animal Traction	day					
- Baler	hr					
6) Labor Force	day	31	40.00	0.86	34.40	1,057
7) Other	%	10				178
Sub-total						1,956
3. Net Income (1.- 2.)						143,245

Taskourt (Perennial, Seasonal, and Flood Irrigation Areas) (Per Hectare)

Fodder (Alfalfa)	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Alfalfa	UF	10,500	5.20	0.86	4.47	46,956
Sub-total						46,956
2. Production Cost						
1) Seed	ha	1	360.00	0.86	309.60	310
2) Manure	ton					
3) Fertilizer						
- Urea	kg	100	2.72	0.85	2.31	231
- TSP	kg	300	2.20	1.01	2.22	667
- K2SO4	kg	200	2.28	0.71	1.62	324
4) Agriculture Chemicals	ha					
5) Mechanization						
- Tractor	hr					
- Animal Traction	day	19.0	40.00	0.86	34.40	654
- Baler	hr					
6) Labor Force	day	114	40.00	0.86	34.40	3,922
7) Other	%	10				611
Sub-total						6,719
3. Net Income (1.- 2.)						40,237

Taskourt (Perennial, Seasonal, and Flood Irrigation Areas) (Per Hectare)

Watermelon	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Watermelon	kg	31,000	4.00	0.86	3.44	106,640
Sub-total						106,640
2. Production Cost						
1) Seed	kg	3	250	0.86	215	645
2) Manure	ton					
3) Fertilizer						
- Urea	kg	457	2.72	0.85	2.31	1,057
- TSP	kg	467	2.20	1.01	2.22	1,038
- K2SO4	kg	300	2.28	0.71	1.62	486
4) Agriculture Chemicals	ha	1	600.00	0.85	510.00	510
5) Mechanization						
- Tractor	ha	1	378.00	0.86	325.08	325
- Animal Traction	day	21.0	41.00	0.86	35.26	740
- Baler	hr					
6) Labor Force	day	155	40.00	0.86	34.40	5,332
7) Other	%	15				1,520
Sub-total						11,653
3. Net Income (1.- 2.)						94,987

Taskourt (Perennial, Seasonal, and Flood Irrigation Areas) (Per Hectare)

Tomato	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Tomato	kg	50,000	2.04	1.17	2.38	119,150
Sub-total						119,150
2. Production Cost						
1) Seed	kg	0.5	820	0.86	705	353
2) Manure	ton					
3) Fertilizer						
- Urea	kg	200	2.72	0.85	2.31	462
- TSP	kg	200	2.20	1.01	2.22	444
- K2SO4	kg	340	2.28	0.71	1.62	550
4) Agriculture Chemicals	ha	1	600.00	0.85	510.00	510
5) Mechanization						
- Tractor	ha	1	378.00	0.86	325.08	325
- Animal Traction	day	38.0	40.00	0.86	34.40	1,307
- Baler	hr					
6) Labor Force	day	200	40.00	0.86	34.40	6,880
7) Other	%	20				2,166
Sub-total						12,997
3. Net Income (1.- 2.)						106,153

Taskourt (Perennial, Seasonal, and Flood Irrigation Areas) (Per Hectare)

Olive	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Olive	kg	10,000	2.61	1.05	2.74	27,390
Sub-total						27,390
2. Production Cost						
1) Seed (lifetime: 30 years,	unit	1	140	0.86	120	120
2) Manure	ton					
3) Fertilizer						
- Urea	kg	130	2.72	0.85	2.31	301
- TSP	kg	111	2.20	1.01	2.22	247
- K2SO4	kg	60	2.28	0.71	1.62	97
4) Agriculture Chemicals	ha	1	150.00	0.85	127.50	128
5) Mechanization						
- Tractor	ha					
- Animal Traction	day	12	40.00	0.86	34.40	413
- Baler	hr					
6) Labor Force	day	68	40.00	0.86	34.40	2,339
7) Other	%	15				547
Sub-total						4,192
3. Net Income (1.- 2.)						23,198

Table XVIII2.2.4: Net Income after Installtion of Irrigation Facilities (4/6)
(Financial and Economic Prices, Per Hectare)

Timkit (Ifegh, Tinejdad, and Chtam) (Per Hectare)

Hard wheat	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grain	kg	4,000	3.33	0.56	1.88	7,516
2) Strow	UF	1,000	3.00	0.86	2.58	2,580
Sub-total						10,096
2. Production Cost						
1) Seed	kg	120	4.00	0.96	3.84	460
2) Manure	ton					
3) Fertilizer						
- Urea	kg	261	2.72	0.85	2.31	603
- TSP	kg	187	2.20	1.01	2.22	416
- K2SO4	kg	180	2.28	0.71	1.62	291
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	unit	1	239.00	0.86	205.54	206
- Animal Traction	day	5.0	40.00	0.86	34.40	172
- Baler	unit	1.0	159.00	0.86	136.74	137
6) Labor Force	day	23	40.00	0.86	34.40	791
7) Other	%	10				312
Sub-total						3,431
3. Net Income (1.- 2.)						6,665

Timkit (Ifegh) (Per Hectare)

Barley	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grain	kg	4,000	1.98	0.67	1.33	5,300
2) Strow	UF	1,000	3.00	0.86	2.58	2,580
Sub-total						7,880
2. Production Cost						
1) Seed	kg	120	4.00	0.93	3.71	445
2) Manure	ton					
3) Fertilizer						
- Urea	kg	261	2.72	0.85	2.31	603
- TSP	kg	187	2.20	1.01	2.22	416
- K2SO4	kg	180	2.28	0.71	1.62	291
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	unit	1	239.00	0.86	205.54	206
- Animal Traction	day	5.0	40.00	0.86	34.40	172
- Baler	unit	1.0	159.00	0.86	136.74	137
6) Labor Force	day	23	40.00	0.86	34.40	791
7) Other	%	10				310
Sub-total						3,414
3. Net Income (1.- 2.)						4,466

Timkit (Ifegh, Tinejdad, and Chtam) (Per Hectare)

Alfalfa	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Alfalfa	UF	10,500	5.20	0.86	4.47	46,956
Sub-total						46,956
2. Production Cost						
1) Seed	ha	1	360.00	0.86	309.60	310
2) Manure	ton					
3) Fertilizer						
- Urea	kg	100	2.72	0.85	2.31	231
- TSP	kg	300	2.20	1.01	2.22	667
- K2SO4	kg	200	2.28	0.71	1.62	324
4) Agriculture Chemicals	ha					
5) Mechanization						
- Tractor	hr					
- Animal Traction	day	19.0	40.00	0.86	34.40	654
- Baler	hr					
6) Labor Force	day	114	40.00	0.86	34.40	3,922
7) Other	%	10				611
Sub-total						6,719
3. Net Income (1.- 2.)						40,237

Timkit (Ifegh and Tinejdad) (Per Hectare)

Potato	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Potato	kg	31,000	2.34	0.90	2.11	65,379
Sub-total						65,379
2. Production Cost						
1) Seed	kg	2000	3.50	1.24	4.34	8,686
2) Manure	ton					
3) Fertilizer						
- Urea	kg	196	2.72	0.85	2.31	453
- TSP	kg	200	2.20	1.01	2.22	444
- K2SO4	kg	240	2.28	0.71	1.62	389
4) Agriculture Chemicals	ha	1	200.00	0.85	170.00	170
5) Mechanization						
- Tractor	ha	1	497.00	0.86	427.42	427
- Animal Traction	day	19	40.00	0.86	34.40	654
- Baler	unit					
6) Labor Force	day	120	40.00	0.86	34.40	4,128
7) Other	%	15				2,303
Sub-total						17,654
3. Net Income (1.- 2.)						47,725

Timkit (Ifegh) (Per Hectare)

Tomato	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Tomato	kg	50,000	2.29	1.08	2.47	123,300
Sub-total						123,300
2. Production Cost						
1) Seed	kg	0.5	820	0.86	705	353
2) Manure	ton					
3) Fertilizer						
- Urea	kg	200	2.72	0.85	2.31	462
- TSP	kg	200	2.20	1.01	2.22	444
- K2SO4	kg	340	2.28	0.71	1.62	550
4) Agriculture Chemicals	ha	1	600.00	0.85	510.00	510
5) Mechanization						
- Tractor	ha	1	378.00	0.86	325.08	325
- Animal Traction	day	38.0	40.00	0.86	34.40	1,307
- Baler	hr					
6) Labor Force	day	200	40.00	0.86	34.40	6,880
7) Other	%	20				2,166
Sub-total						12,997
3. Net Income (1.- 2.)						110,303

Timkit (Ifegh, Tinejdad, and Chtam) (Per Hectare)

Dates	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Dates	kg	3,500	8.00	1.41	11.31	39,568
Sub-total						39,568
2. Production Cost						
1) Seed (lifetime: 50 years, replacement cost only)						
2) Manure	ton					
3) Fertilizer	kg	400	2.52	0.85	2.14	857
- Urea						
- TSP						
- K2SO4						
4) Agriculture Chemicals	ha					
5) Mechanization						
- Tractor	hr					
- Animal Traction	day					
- Baler	hr					
6) Labor Force	day	50	40.00	0.86	34.40	1,720
7) Other	%					
Sub-total						2,577
3. Net Income (1.- 2.)						36,991

Table XVIII2.2.4: Net Income after Installtion of Irrigation Facilities (5/6)
(Financial and Economic Prices, Per Hectare)

Timkit (Tinejdad and Chtam) (Per Hectare)

Watermelon	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Watermelon	kg	31,000	3.75	0.86	3.23	99,975
Sub-total						99,975
2. Production Cost						
1) Seed	kg	3	250	0.86	215	645
2) Manure	ton					
3) Fertilizer						
- Urea	kg	457	2.72	0.85	2.31	1,057
- TSP	kg	467	2.20	1.01	2.22	1,038
- K2SO4	kg	300	2.28	0.71	1.62	486
4) Agriculture Chemicals	ha	1	600.00	0.85	510.00	510
5) Mechanization						
- Tractor	ha	1	378.00	0.86	325.08	325
- Animal Traction	day	21.0	41.00	0.86	35.26	740
- Baler	hr					
6) Labor Force	day	155	40.00	0.86	34.40	5,332
7) Other	%	15				1,520
Sub-total						11,653
3. Net Income (1.- 2.)						88,322

Timkit (Tinejdad and Chtam) (Per Hectare)

Olive	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Olive	kg	10,000	2.69	0.99	2.66	26,580
Sub-total						26,580
2. Production Cost						
1) Seed (lifetime: 30 years, replacement cost only)	unit	1	140	0.86	120	120
2) Manure	ton					
3) Fertilizer						
- Urea	kg	130	2.72	0.85	2.31	301
- TSP	kg	111	2.20	1.01	2.22	247
- K2SO4	kg	60	2.28	0.71	1.62	97
4) Agriculture Chemicals	ha	1	150.00	0.85	127.50	128
5) Mechanization						
- Tractor	ha					
- Animal Traction	day	12	40.00	0.86	34.40	413
- Baler	hr					
6) Labor Force	day	68	40.00	0.86	34.40	2,339
7) Other	%	15				547
Sub-total						4,192
3. Net Income (1.- 2.)						22,388

Timkit (Chtam) for the first three years
(Production cost only) (Per Hectare)

Dates	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
Plantation, 1st year						
1) Seeding	tree	100	170.00	0.86	146.20	14,620
2) Cultivation						
Digging	hour	8	56.00	0.86	48.16	385
Crop covering	day	30	40.00	0.86	34.40	1,032
3) Fertilization						
Fertilizer for dressing	100kg	10	252.00	0.85	214.20	2,142
Manpower for dressing	day	100	40.00	0.86	34.40	3,440
Total						21,619
Cultivation, annual cost of 2nd & 3rd year						
1) Fertilization						
Fertilizer for dressing	100kg	3	252.00	0.85	214.20	643
Manpower for dressing	day	2	40.00	0.86	34.40	69
2) Maintenance	day	28	40.00	0.86	34.40	963
Total						1,675

Timkit (Chtam) for the first three years
(Production cost only) (Per Hectare)

Olive	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
Plantation, 1st year						
1) Seeding	tree	200	19.00	0.86	16.34	3,268
2) Cultivation						
Digging	hour	6	56.00	0.86	48.16	289
Crop covering	day	20	40.00	0.86	34.40	688
3) Fertilization						
Fertilizer for dressing	100kg	3	252.00	0.85	214.20	643
Manpower for dressing	day	14	40.00	0.86	34.40	482
4) Maintenance	day	8	40.00	0.86	34.40	275
Total						5,645
Cultivation, annual cost of 2nd & 3rd year						
1) Fertilization						
Fertilizer for dressing	100kg	3	212.00	0.85	180.20	541
Manpower for dressing	day	14	40.00	0.86	34.40	482
2) Maintenance	day	2	40.00	0.86	34.40	69
Total						1,092

Azghar (Per Hectare)

Hard wheat	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grain	kg	4,000	3.23	0.52	1.67	6,692
2) Strow	UF	1,000	3.00	0.86	2.58	2,580
Sub-total						9,272
2. Production Cost						
1) Seed	kg	120	4.00	0.91	3.64	437
2) Manure	ton					
3) Fertilizer						
- Urea	kg	261	2.72	0.85	2.31	603
- TSP	kg	187	2.20	1.01	2.22	416
- K2SO4	kg	180	2.28	0.71	1.62	291
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	hr	1	239.00	0.86	205.54	206
- Animal Traction	day	5.0	40.00	0.86	34.40	172
- Baler	hr	1.0	159.00	0.86	136.74	137
6) Labor Force	day	23	40.00	0.86	34.40	791
7) Other	%	10				310
Sub-total						3,406
3. Net Income (1.- 2.)						5,866

Azghar (Per Hectare)

Barley	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grain	kg	4,000	2.00	0.56	1.12	4,480
2) Strow	UF	1,000	3.00	0.86	2.58	2,580
Sub-total						7,060
2. Production Cost						
1) Seed	kg	120	4.00	0.88	3.51	421
2) Manure	ton					
3) Fertilizer						
- Urea	kg	261	2.72	0.85	2.31	603
- TSP	kg	187	2.20	1.01	2.22	416
- K2SO4	kg	180	2.28	0.71	1.62	291
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	hr	1	239.00	0.86	205.54	206
- Animal Traction	day	5.0	40.00	0.86	34.40	172
- Baler	hr	1.0	159.00	0.86	136.74	137
6) Labor Force	day	23	40.00	0.86	34.40	791
7) Other	%	10				308
Sub-total						3,388
3. Net Income (1.- 2.)						3,672

Table XVIII2.2.4: Net Income after Installtion of Irrigation Facilities (6/6)
(Financial and Economic Prices, Per Hectare)

Azghar (Per Hectare)

Fodder (Barley)	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Grain and strow	UF	2,300	3.00	0.86	2.58	5,934
Sub-total						5,934
2. Production Cost						
1) Seed	kg	120	4.00	0.86	3.44	413
2) Manure	ton					
3) Fertilizer						
- Urea	kg	261	2.72	0.85	2.31	603
- TSP	kg	187	2.20	1.01	2.22	416
- K2SO4	kg	180	2.28	0.71	1.62	291
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	hr	1	239.00	0.86	205.54	206
- Animal Traction	day	5.0	40.00	0.86	34.40	172
- Baler	hr	1.0	159.00	0.86	136.74	137
6) Labor Force	day	23	40.00	0.86	34.40	791
7) Other	%	10				307
Sub-total						3,379
3. Net Income (1.- 2.)						2,555

Azghar (Per Hectare)

Fodder (Alfalfa)	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Alfalfa	UF	10,500	5.20	0.86	4.47	46,956
Sub-total						46,956
2. Production Cost						
1) Seed	ha	1	360.00	0.86	309.60	310
2) Manure	ton					
3) Fertilizer						
- Urea	kg	100	2.72	0.85	2.31	231
- TSP	kg	300	2.20	1.01	2.22	667
- K2SO4	kg	200	2.28	0.71	1.62	324
4) Agriculture Chemicals	ha					
5) Mechanization						
- Tractor	hr					
- Animal Traction	day	19.0	40.00	0.86	34.40	654
- Baler	hr					
6) Labor Force	day	114	40.00	0.86	34.40	3,922
7) Other	%	10				611
Sub-total						6,719
3. Net Income (1.- 2.)						40,237

Azghar (Per Hectare)

Summer Vegetable (Broad Bean)	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Broad bean	kg	15,000	3.73	0.8601	3.21	48,120
Sub-total						48,120
2. Production Cost						
1) Seed	kg	60	10.00	0.97	9.74	584
2) Manure	ton					
3) Fertilizer						
- Urea	kg	72	2.72	0.85	2.31	166
- TSP	kg	244	2.20	1.01	2.22	542
- K2SO4	kg	300	2.28	0.71	1.62	486
4) Agriculture Chemicals	ha	1	50.00	0.85	42.50	43
5) Mechanization						
- Tractor	ha	1	378.00	0.86	325.08	325
- Animal Traction	day	21.0	40.00	0.86	34.40	722
- Baler	hr					
6) Labor Force	day	194	40.00	0.86	34.40	6,674
7) Other	%	10				954
Sub-total						10,496
3. Net Income (1.- 2.)						37,624

Azghar (Per Hectare)

Vegetable (Potato)	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Potato	kg	31,000	2.99	0.88	2.63	81,592
Sub-total						81,592
2. Production Cost						
1) Seed	kg	2000	3.50	1.18	4.14	8,276
2) Manure	ton					
3) Fertilizer						
- Urea	kg	196	2.72	0.85	2.31	453
- TSP	kg	200	2.20	1.01	2.22	444
- K2SO4	kg	240	2.28	0.71	1.62	389
4) Agriculture Chemicals	ha	1	200.00	0.85	170.00	170
5) Mechanization						
- Tractor	ha	1	497.00	0.86	427.42	427
- Animal Traction	day	19	40.00	0.86	34.40	654
- Baler	unit					
6) Labor Force	day	120	40.00	0.86	34.40	4,128
7) Other	%	15				2,241
Sub-total						17,182
3. Net Income (1.- 2.)						64,410

Azghar (Per Hectare)

Summer Vegetable (Tomato)	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Tomato	kg	50,000	2.07	1.16	2.40	119,750
Sub-total						119,750
2. Production Cost						
1) Seed	kg	0.5	820	0.86	705	353
2) Manure	ton					
3) Fertilizer						
- Urea	kg	200	2.72	0.85	2.31	462
- TSP	kg	200	2.20	1.01	2.22	444
- K2SO4	kg	340	2.28	0.71	1.62	550
4) Agriculture Chemicals	ha	1	600.00	0.85	510.00	510
5) Mechanization						
- Tractor	ha	1	378.00	0.86	325.08	325
- Animal Traction	day	38.0	40.00	0.86	34.40	1,307
- Baler	hr					
6) Labor Force	day	200	40.00	0.86	34.40	6,880
7) Other	%	20				2,166
Sub-total						12,997
3. Net Income (1.- 2.)						106,753

Azghar (Per Hectare)

Fruits (Olive)	Unit	Q'ty	Unit Price (financial)	Conv. factor	Unit Price (economic)	Amount (DH)
1. Gross Income						
1) Olive	kg	10,000	3.04	0.99	3.02	30,200
Sub-total						30,200
2. Production Cost						
1) Seed (lifetime: 30 years,	unit	1	140	0.86	120	120
2) Manure	ton					
3) Fertilizer						
- Urea	kg	130	2.72	0.85	2.31	301
- TSP	kg	111	2.20	1.01	2.22	247
- K2SO4	kg	60	2.28	0.71	1.62	97
4) Agriculture Chemicals	ha	1	150.00	0.85	127.50	128
5) Mechanization						
- Tractor	ha					
- Animal Traction	day	12	40.00	0.86	34.40	413
- Baler	hr					
6) Labor Force	day	68	40.00	0.86	34.40	2,339
7) Other	%	15				547
Sub-total						4,192
3. Net Income (1.- 2.)						26,008

Table XVIII2.2.5: Expected Farm Income with Project (1/3)
(Economic Price, DH/ha)

N'fifikh (upsteam area) - applied for NU1, NU4, and NU5

Crops		Benefit						Expenditure		Net
		Occupancy	Yield		Unit price		Benefit	Unit cost	Net cost	Benefit
		(%)	Qty.	Unit	(DH)	Unit	(DH)	(DH/ha)	(DH)	(DH)
		a	b		c		d=a*b*c	e	f=e*a	g=d-f
Cerelas	Soft wheat	60	4.0	(ton/ha)	1.41	(DH/kg)	3,394	3,296	1,978	1,416
Fodder 1	Barley	5	2,300	UF	2.58	UF	297	3,379	169	128
Fodder 2	Alfalfa	5	10,500	UF	4.47	UF	2,347	6,719	336	2,011
Vegetable 1	Potato	15	31	(ton/ha)	1.92	(DH/kg)	8,942	16,922	2,538	6,404
Vegetable 2	Totato	5	50	(ton/ha)	2.05	(DH/kg)	5,120	12,997	650	4,470
Tree crop 1	Grape	5	10	(ton/ha)	2.60	(DH/kg)	1,301	3,790	190	1,111
Tree crop 2	Olive	5	10	(ton/ha)	2.35	(DH/kg)	1,175	4,192	210	965
Fodder from cereals	-	60	1,000	UF	2.58	UF	1,548	-	-	1,548
Total		160					24,124		6,071	18,053

N'fifikh (upsteam area) - applied for NU2

Crops		Benefit						Expenditure		Net
		Occupancy	Yield		Unit price		Benefit	Unit cost	Net cost	Benefit
		(%)	Qty.	Unit	(DH)	Unit	(DH)	(DH/ha)	(DH)	(DH)
		a	b		c		d=a*b*c	e	f=e*a	g=d-f
Cerelas 1	Soft wheat	50	4.0	(ton/ha)	1.41	(DH/kg)	2,828	3,296	1,648	1,180
Cerelas 2	Hard wheat	33	4.0	(ton/ha)	1.56	(DH/kg)	2,064	3,390	1,119	945
Fodder	Barley	5	2,300	UF	2.58	UF	297	3,379	169	128
Regume	Broad bean	5	15	(ton/ha)	3.38	(DH/kg)	2,535	10,504	525	2,010
Vegetable	Potato	2	31	(ton/ha)	1.92	(DH/kg)	1,192	16,922	338	854
Tree crop	Grape	5	10	(ton/ha)	2.60	(DH/kg)	1,301	3,790	190	1,111
Fodder from cereals 1	-	50	1,000	UF	2.58	UF	1,290	-	-	1,290
Fodder from cereals 2	-	33	1,000	UF	2.58	UF	851	-	-	851
Total		183					12,358		3,989	8,369

N'fifikh (upsteam area) - applied for NU3

Crops		Benefit						Expenditure		Net
		Occupancy	Yield		Unit price		Benefit	Unit cost	Net cost	Benefit
		(%)	Qty.	Unit	(DH)	Unit	(DH)	(DH/ha)	(DH)	(DH)
		a	b		c		d=a*b*c	e	f=e*a	g=d-f
Cerelas	Soft wheat	30	4.0	(ton/ha)	1.41	(DH/kg)	1,697	3,296	989	708
Fodder 1	Barley	12.5	2,300	UF	2.58	UF	742	3,379	422	320
Fodder 2	Alfalfa	12.5	10,500	UF	4.47	UF	5,867	6,719	840	5,027
Vegetable 1	Potato	15	31	(ton/ha)	1.92	(DH/kg)	8,942	16,922	2,538	6,404
Vegetable 2	Totato	15	50	(ton/ha)	2.05	(DH/kg)	15,360	12,997	1,950	13,410
Tree crop 1	Grape	7.5	10	(ton/ha)	2.60	(DH/kg)	1,951	3,790	284	1,667
Tree crop 2	Olive	7.5	10	(ton/ha)	2.35	(DH/kg)	1,762	4,192	314	1,448
Fodder from cereals	-	30	1,000	UF	2.58	UF	774	-	-	774
Total		130					37,095		7,337	29,758

N'fifikh (downstream area) - applied for ND1 and ND2

Crops		Benefit						Expenditure		Net
		Occupancy	Yield		Unit price		Benefit	Unit cost	Net cost	Benefit
		(%)	Qty.	Unit	(DH)	Unit	(DH)	(DH/ha)	(DH)	(DH)
		a	b		c		d=a*b*c	e	f=e*a	g=d-f
Cerelas	Soft wheat	55	4.0	(ton/ha)	1.41	(DH/kg)	3,111	3,296	1,813	1,298
Fodder 1	Barley	12.5	2,300	UF	2.58	UF	742	3,379	422	320
Fodder 2	Alfalfa	2.5	10,500	UF	4.47	UF	1,173	6,719	168	1,005
Vegetable 1	Potato	10	31	(ton/ha)	1.92	(DH/kg)	5,961	16,922	1,692	4,269
Vegetable 2	Tomato	5	50	(ton/ha)	2.05	(DH/kg)	5,120	12,997	650	4,470
Tree crop	Grape	15	10	(ton/ha)	2.60	(DH/kg)	3,902	3,790	569	3,333
Fodder from cereals	-	55	1,000	UF	2.58	UF	1,419	-	-	1,419
Total		155					21,428		5,314	16,114

Table XVIII2.2.5: Expected Farm Income with Project (2/3)
(Economic Price, DH/ha)

Taskourt (Perennial, Seasonal, and Flood Irrigation Area) - applied for TA1, TA2, TA3, and TA4

Crops		Benefit						Expenditure		Net
		Occupancy	Yield		Unit price		Benefit	Unit cost	Net cost	Benefit
		(%)	Qty.	Unit	(DH)	Unit	(DH)	(DH/ha)	(DH)	(DH)
		a	b		c		d=a*b*c	e	f=e*a	g=d-f
Cerelas 1	Soft wheat	60	4.0	(ton/ha)	1.50	(DH/kg)	3,607	3,306	1,984	1,623
Cerelas 2	Barley	10	4.0	(ton/ha)	1.10	(DH/kg)	440	3,385	339	101
Fodder	Alfalfa	10	10,500	UF	4.47	UF	4,694	6,719	672	4,022
Vegetable 1	Watermelon	5	31	(ton/ha)	3.44	(DH/kg)	5,332	11,653	583	4,749
Vegetable 2	Tomato	5	50	(ton/ha)	2.38	(DH/kg)	5,958	12,997	650	5,308
Tree crop 1	Olive	8	10	(ton/ha)	2.74	(DH/kg)	2,191	4,192	335	1,856
Tree crop 2	Almond	2	3.5	(ton/ha)	41.49	(DH/kg)	2,904	1,956	39	2,865
Fodder from cereals 1	-	60	1,000	UF	2.58	UF	1,548	-	-	1,548
Fodder from cereals 2	-	10	1,000	UF	2.58	UF	258	-	-	258
Total		170					26,932		4,602	22,330

Timkit (Ifegh) - applied for TI1 and TI2

Crops		Benefit						Expenditure		Net
		Occupancy	Yield		Unit price		Benefit	Unit cost	Net cost	Benefit
		(%)	Qty.	Unit	(DH)	Unit	(DH)	(DH/ha)	(DH)	(DH)
		a	b		c		d=a*b*c	e	f=e*a	g=d-f
Cerelas 1	Hard wheat	55	4.0	(ton/ha)	1.88	(DH/kg)	4,134	3,431	1,887	2,247
Cerelas 2	Barley	10	4.0	(ton/ha)	1.33	(DH/kg)	530	3,414	341	189
Fodder	Alfalfa	15	10,500	UF	4.47	UF	7,040	6,719	1,008	6,032
Vegetable 1	Potato	5	31	(ton/ha)	2.11	(DH/kg)	3,269	17,654	883	2,386
Vegetable 2	Tomato	10	50	(ton/ha)	2.47	(DH/kg)	12,330	12,997	1,300	11,030
Tree crop	Dates	10	3.5	(ton/ha)	11.31	(DH/kg)	3,957	2,577	258	3,699
Fodder from cereals 1	-	55	1,000	UF	2.58	UF	1,419	-	-	1,419
Fodder from cereals 2	-	10	1,000	UF	2.58	UF	258	-	-	258
Total		170					32,937		5,677	27,260

Timkit (Tinejdad) - applied for TI1 and TI2

Crops		Benefit						Expenditure		Net
		Occupancy	Yield		Unit price		Benefit	Unit cost	Net cost	Benefit
		(%)	Qty.	Unit	(DH)	Unit	(DH)	(DH/ha)	(DH)	(DH)
		a	b		c		d=a*b*c	e	f=e*a	g=d-f
Cerelas	Hard wheat	55	4.0	(ton/ha)	1.88	(DH/kg)	4,134	3,431	1,887	2,247
Fodder	Alfalfa	15	10,500	UF	4.47	UF	7,040	6,719	1,008	6,032
Vegetable 1	Potato	10	31	(ton/ha)	2.11	(DH/kg)	6,538	17,654	1,765	4,773
Vegetable 2	Watermelon	5	31	(ton/ha)	3.23	(DH/kg)	4,999	11,653	583	4,416
Tree crop 1	Datas	15	3.5	(ton/ha)	11.31	(DH/kg)	5,935	2,577	387	5,548
Tree crop 2	Olive	5	10	(ton/ha)	2.66	(DH/kg)	1,329	4,192	210	1,119
Fodder from cereals	-	55	1,000	UF	2.58	UF	1,419	-	-	1,419
Total		160					31,394		5,840	25,554

Timkit (Chtam) - applied for TI1 and TI2

Crops		Benefit						Expenditure		Net
		Occupancy	Yield		Unit price		Benefit	Unit cost	Net cost	Benefit
		(%)	Qty.	Unit	(DH)	Unit	(DH)	(DH/ha)	(DH)	(DH)
		a	b		c		d=a*b*c	e	f=e*a	g=d-f
Cerelas	Hard wheat	75	4.0	(ton/ha)	1.88	(DH/kg)	5,637	3,431	2,573	3,064
Fodder	Alfalfa	10	10,500	UF	4.47	UF	4,694	6,719	672	4,022
Vegetable	Watermelon	5	31	(ton/ha)	3.23	(DH/kg)	4,999	11,653	583	4,416
Tree crop 1	Dates	8	3.5	(ton/ha)	11.31	(DH/kg)	3,165	2,577	206	2,959
Tree crop 2	Olive	2	10	(ton/ha)	2.66	(DH/kg)	532	4,192	84	448
Fodder from cereals	-	75	1,000	UF	2.58	UF	1,935	-	-	1,935
Total		175					20,962		4,118	16,844

Table XVIII2.2.5: Expected Farm Income with Project (3/3)
(Economic Price, DH/ha)

Azghar - applied for AZ1

Crops		Benefit						Expenditure		Net
		Occupancy (%) a	Yield		Unit price		Benefit (DH) d=a*b*c	Unit cost (DH/ha) e	Net cost (DH) f=e*a	Benefit (DH) g=d-f
			Qty. b	Unit	(DH) c	Unit				
Cerelas 1	Hard wheat	50	4.0	(ton/ha)	1.67	(DH/kg)	3,346	3,406	1,703	1,643
Cerelas 2	Barley	10	4.0	(ton/ha)	1.12	(DH/kg)	448	3,388	339	109
Fodder 1	Barley	2.5	2,300	UF	2.58	UF	148	3,379	84	64
Fodder 2	Alfalfa	7.5	10,500	UF	4.47	UF	3,520	6,719	504	3,016
Legetable	Broad bean	5	15	(ton/ha)	3.21	(DH/kg)	2,406	10,496	525	1,881
Vegetable 1	Potato	10	31	(ton/ha)	2.63	(DH/kg)	8,159	17,182	1,718	6,441
Vegetable 2	Tomato	10	50	(ton/ha)	2.40	(DH/kg)	11,975	12,997	1,300	10,675
Tree crop	Olive	15	10	(ton/ha)	3.02	(DH/kg)	4,530	4,192	629	3,901
Fodder from cereals 1	-	50	1,000	UF	2.58	UF	1,290	-	-	1,290
Fodder from cereals 2	-	10	1,000	UF	2.58	UF	258	-	-	258
Total		170					36,080		6,802	29,278

Table XVIII2.2.6 Annual Agricultural Benefit of Alternative Plans

Project	Alternative plans	Location within the Project	Annual average irrigable area (ha)	Benefit without Project		Benefit with Project		Incremental net benefit with Project (million DH)
				Unit benefit (DH/ha)	Total benefit (million DH)	Unit benefit (DH/ha)	Total benefit (million DH)	
a	b	c	d	e	f = d x e	g	h = d x g	i = h - f
N'fifikh (upstream)	NU1	Upstream	853	2,267	1.9	18,053	15.4	13.5
	NU2	Upstream	886	2,267	2.0	8,369	7.4	5.4
	NU3	Upstream	645	2,267	1.5	29,758	19.2	17.7
	NU4	Upstream	984	2,267	2.2	18,053	17.8	15.6
	NU5	Upstream	853	2,267	1.9	18,053	15.4	13.5
N'fifikh (downstream)	ND1	Downstream	228	2,181	0.5	16,114	3.7	3.2
	ND2	Downstream	510	2,181	1.1	16,114	8.2	7.1
Taskourt	TA1	Perennial irrigation area	900	12,420	11.2	22,330	20.1	8.9
		Seasonal & flood irri. area	2,931	138	0.4	22,330	65.4	65.0
		Total	3,831	-	11.6	-	85.5	73.9
	TA2	Perennial irrigation area	900	12,420	11.2	22,330	20.1	8.9
		Seasonal & flood irri. area	3,506	138	0.5	22,330	78.3	77.8
		Total	4,406	-	11.7	-	98.4	86.7
	TA3	Perennial irrigation area	900	12,420	11.2	22,330	20.1	8.9
		Seasonal & flood irri. area	1,813	138	0.3	22,330	40.5	40.2
		Total	2,713	-	11.5	-	60.6	49.1
	TA4	Perennial irrigation area	900	12,420	11.2	22,330	20.1	8.9
		Seasonal & flood irri. area	2,226	138	0.3	22,330	49.7	49.4
		Total	3,126	-	11.5	-	69.8	58.3
Timkit	TI1	Ifeg	240	7,710	1.9	27,260	6.5	4.6
		Tinejdad	1,173	8,876	10.4	25,554	30.0	19.6
		Chtam	277	2,752	0.8	16,844	4.7	3.9
		Total	1,690	-	13.1	-	41.2	28.1
	TI2	Ifeg	240	7,710	1.9	27,260	6.5	4.6
		Tinejdad	1,075	8,876	9.5	25,554	27.5	18.0
		Chtam	255	2,752	0.7	16,844	4.3	3.6
		Total	1,570	-	12.1	-	38.3	26.2
Azghar	AZ1	Whole area	2,000	165	0.3	29,278	58.6	58.3

Table XVIII2.2.7 Financial and Economic Project Cost (1/3)
(Unit: Million DH)

Cost Item	Foreign Currency Portion		Local Currency Portion		Total financial cost	Total economic cost
	Financial cost	Economic cost	Financial cost	Economic cost		
NU1 N'fifikh (Upstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	141.4	102.4	76.1	47.4	217.5	149.8
1.2 Irrigation facilities	27.7	20.1	27.6	17.2	55.3	37.3
2. Resettlement cost	0.0	0.0	4.1	3.1	4.1	3.1
3. Engineering services cost	13.1	9.0	7.0	4.8	20.1	13.8
4. Administration cost	0.0	0.0	13.8	9.5	13.8	9.5
Total of (1.- 4.)	182.2	131.5	128.6	82.0	310.8	213.5
NU2 N'fifikh (Upstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	141.4	102.4	76.1	47.4	217.5	149.8
1.2 Irrigation facilities	28.5	20.7	28.5	17.8	57.0	38.5
2. Resettlement cost	0.0	0.0	4.1	3.1	4.1	3.1
3. Engineering services cost	13.1	9.0	7.1	4.9	20.2	13.9
4. Administration cost	0.0	0.0	13.9	9.6	13.9	9.6
Total of (1.- 4.)	183.0	132.1	129.7	82.8	312.7	214.9
NU3 N'fifikh (Upstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	141.4	102.4	76.1	47.4	217.5	149.8
1.2 Irrigation facilities	27.7	20.1	27.6	17.2	55.3	37.3
2. Resettlement cost	0.0	0.0	4.1	3.1	4.1	3.1
3. Engineering services cost	13.1	9.0	7.0	4.8	20.1	13.8
4. Administration cost	0.0	0.0	13.8	9.5	13.8	9.5
Total of (1.- 4.)	182.2	131.5	128.6	82.0	310.8	213.5
NU4 N'fifikh (Upstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	141.4	102.4	76.1	47.4	217.5	149.8
1.2 Irrigation facilities	65.6	47.6	65.6	40.9	131.2	88.5
2. Resettlement cost	0.0	0.0	4.1	3.1	4.1	3.1
3. Engineering services cost	16.7	11.5	9.0	6.2	25.7	17.7
4. Administration cost	0.0	0.0	17.6	12.1	17.6	12.1
Total of (1.- 4.)	223.7	161.5	172.4	109.7	396.1	271.2
NU5 N'fifikh (Upstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	141.4	102.4	76.1	47.4	217.5	149.8
1.2 Irrigation facilities	28.0	20.3	28.0	17.5	56.0	37.8
2. Resettlement cost	0.0	0.0	4.1	3.1	4.1	3.1
3. Engineering services cost	13.1	9.0	7.1	4.9	20.2	13.9
4. Administration cost	0.0	0.0	13.9	9.5	13.9	9.5
Total of (1.- 4.)	182.5	131.7	129.2	82.4	311.7	214.1

Table XVIII2.2.7 Financial and Economic Project Cost (2/3)
(Unit: Million DH)

Cost Item	Foreign Currency Portion		Local Currency Portion		Total financial cost	Total economic cost
	Financial cost	Economic cost	Financial cost	Economic cost		
ND1 N'fifikh (Downstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	5.9	4.3	3.1	1.9	9.0	6.2
1.2 Irrigation facilities	22.0	15.9	21.9	13.7	43.9	29.6
2. Resettlement cost	0.0	0.0	0.0	0.0	0.0	0.0
3. Engineering services cost	2.5	1.7	1.4	1.0	3.9	2.7
4. Administration cost	0.0	0.0	2.6	1.8	2.6	1.8
Total of (1.- 4.)	30.4	21.9	29.0	18.4	59.4	40.3
ND2 N'fifikh (Downstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	35.9	26.0	19.4	12.1	55.3	38.1
1.2 Irrigation facilities	49.9	36.2	49.8	31.0	99.7	67.2
2. Resettlement cost	0.0	0.0	0.0	0.0	0.0	0.0
3. Engineering services cost	7.4	5.1	4.0	2.8	11.4	7.9
4. Administration cost	0.0	0.0	7.8	5.3	7.8	5.3
Total of (1.- 4.)	93.2	67.3	81.0	51.2	174.2	118.5
TA1 Taskourt						
1. Construction cost						
1.1 Dam and appurtenant facilities	453.0	342.8	243.9	158.7	696.9	501.5
1.2 Irrigation facilities	95.8	72.4	95.7	62.2	191.5	134.6
2. Resettlement cost	0.0	0.0	71.6	54.0	71.6	54.0
3. Engineering services cost	42.5	30.5	23.0	16.5	65.5	47.0
4. Administration cost	0.0	0.0	48.0	34.5	48.0	34.5
Total of (1.- 4.)	591.3	445.7	482.2	325.9	1,073.5	771.6
TA2 Taskourt						
1. Construction cost						
1.1 Dam and appurtenant facilities	453.0	342.8	243.9	158.7	696.9	501.5
1.2 Irrigation facilities	247.6	187.2	247.6	161.0	495.2	348.2
2. Resettlement cost	0.0	0.0	71.6	54.0	71.6	54.0
3. Engineering services cost	57.1	41.0	30.7	22.1	87.8	63.1
4. Administration cost	0.0	0.0	63.2	45.2	63.2	45.2
Total of (1.- 4.)	757.7	571.0	657.0	441.0	1,414.7	1,012.0
TA3 Taskourt						
1. Construction cost						
1.1 Dam and appurtenant facilities	260.2	196.9	140.1	91.2	400.3	288.1
1.2 Irrigation facilities	95.8	72.4	95.7	62.2	191.5	134.6
2. Resettlement cost	0.0	0.0	35.7	26.9	35.7	26.9
3. Engineering services cost	28.3	20.3	15.3	11.0	43.6	31.3
4. Administration cost	0.0	0.0	31.4	22.5	31.4	22.5
Total of (1.- 4.)	384.3	289.6	318.2	213.8	702.5	503.4
TA4 Taskourt						
1. Construction cost						
1.1 Dam and appurtenant facilities	260.2	196.9	140.1	91.2	400.3	288.1
1.2 Irrigation facilities	218.5	165.2	218.5	142.1	437.0	307.3
2. Resettlement cost	0.0	0.0	35.7	26.9	35.7	26.9
3. Engineering services cost	40.1	28.8	21.6	15.5	61.7	44.3
4. Administration cost	0.0	0.0	43.7	31.1	43.7	31.1
Total of (1.- 4.)	518.8	390.9	459.6	306.8	978.4	697.7

Table XVIII2.2.7 Financial and Economic Project Cost (3/3)
(Unit: Million DH)

Cost Item	Foreign Currency Portion		Local Currency Portion		Total financial cost	Total economic cost
	Financial cost	Economic cost	Financial cost	Economic cost		
TI1 Timkit						
1. Construction cost						
1.1 Dam and appurtenant facilities	153.4	116.1	82.6	53.7	236.0	169.8
1.2 Irrigation facilities	81.7	61.8	81.6	53.1	163.3	114.9
2. Resettlement cost	0.0	0.0	8.0	6.0	8.0	6.0
3. Engineering services cost	19.1	13.7	10.3	7.4	29.4	21.1
4. Administration cost	0.0	0.0	20.4	14.5	20.4	14.5
Total of (1.- 4.)	254.2	191.6	202.9	134.7	457.1	326.3
TI2 Timkit						
1. Construction cost						
1.1 Dam and appurtenant facilities	153.4	116.1	82.6	53.7	236.0	169.8
1.2 Irrigation facilities	81.7	61.8	81.6	53.1	163.3	114.9
2. Resettlement cost	0.0	0.0	8.0	6.0	8.0	6.0
3. Engineering services cost	19.1	13.7	10.3	7.4	29.4	21.1
4. Administration cost	0.0	0.0	20.4	14.5	20.4	14.5
Total of (1.- 4.)	254.2	191.6	202.9	134.7	457.1	326.3
AZ1 Azghar						
1. Construction cost						
1.1 Dam and appurtenant facilities	111.1	80.4	59.8	37.2	170.9	117.6
1.2 Irrigation facilities	55.6	40.3	55.6	34.7	111.2	75.0
2. Resettlement cost	0.0	0.0	6.4	4.8	6.4	4.8
3. Engineering services cost	13.5	9.3	7.3	5.0	20.8	14.3
4. Administration cost	0.0	0.0	14.4	9.9	14.4	9.9
Total of (1.- 4.)	180.2	130.0	143.5	91.6	323.7	221.6

Note: 1. Price level: as of April 2000, US$1.0 = 10.68 DH, J. Yen100 = 9.90 DH

2. Engineering service fee is estimated as 7 % of total construction cost

3. Administration cost is estimated as 5 % of construction cost and resettlement cost.

4. Financial cost includes physical contingency, price contingency, and the Value Added Tax.

5. Economic cost does not include price contingency and the Value Added Tax.

Table XVIII2.2.8 Breakdown of Annual Cost (1/3)
(Economic Price, million DH)

Cost Item	Year in Order					Total cost
	1st	2nd	3rd	4th	5th	
NU1 N'fifikh (Upstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	35.9	76.2	37.7	-	149.8
1.2 Irrigation facilities	-	7.5	18.7	11.1	-	37.3
2. Resettlement cost	1.6	1.5	-	-	-	3.1
3. Engineering services cost	-	4.7	4.6	4.5	-	13.8
4. Administration cost	0.1	2.2	4.7	2.5	-	9.5
Total of (1.- 4.)	1.7	51.8	104.2	55.8	-	213.5
NU2 N'fifikh (Upstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	35.9	76.2	37.7	-	149.8
1.2 Irrigation facilities	-	7.7	19.3	11.5	-	38.5
2. Resettlement cost	1.6	1.5	-	-	-	3.1
3. Engineering services cost	-	2.8	2.8	8.3	-	13.9
4. Administration cost	0.1	2.3	4.8	2.4	-	9.6
Total of (1.- 4.)	1.7	50.2	103.1	59.9	-	214.9
NU3 N'fifikh (Upstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	35.9	76.2	37.7	-	149.8
1.2 Irrigation facilities	-	7.5	18.7	11.1	-	37.3
2. Resettlement cost	1.6	1.5	-	-	-	3.1
3. Engineering services cost	-	4.7	4.6	4.5	-	13.8
4. Administration cost	0.1	2.2	4.7	2.5	-	9.5
Total of (1.- 4.)	1.7	51.8	104.2	55.8	-	213.5
NU4 N'fifikh (Upstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	35.9	76.2	37.7	-	149.8
1.2 Irrigation facilities	-	17.7	44.3	26.5	-	88.5
2. Resettlement cost	1.6	1.5	-	-	-	3.1
3. Engineering services cost	-	6.0	5.8	5.9	-	17.7
4. Administration cost	0.1	2.8	6.0	3.2	-	12.1
Total of (1.- 4.)	1.7	63.9	132.3	73.3	-	271.2
NU5 N'fifikh (Upstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	35.9	76.2	37.7	-	149.8
1.2 Irrigation facilities	-	7.6	18.9	11.3	-	37.8
2. Resettlement cost	1.6	1.5	-	-	-	3.1
3. Engineering services cost	-	4.7	4.6	4.6	-	13.9
4. Administration cost	0.1	2.3	4.8	2.3	-	9.5
Total of (1.- 4.)	1.7	52.0	104.5	55.9	-	214.1

Table XVIII2.2.8 Breakdown of Annual Cost (2/3)
(Economic Price, million DH)

Cost Item	Year in Order					Total
	1st	2nd	3rd	4th	5th	cost
ND1 N'fifikh (Downstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	1.5	3.1	1.6	-	6.2
1.2 Irrigation facilities	-	5.9	14.8	8.9	-	29.6
2. Resettlement cost	-	-	-	-	-	-
3. Engineering services cost	-	0.9	0.9	0.9	-	2.7
4. Administration cost	-	0.4	0.9	0.5	-	1.8
Total of (1.- 4.)	-	8.7	19.7	11.9	-	40.3
ND2 N'fifikh (Downstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	9.1	19.4	9.6	-	38.1
1.2 Irrigation facilities	-	13.4	33.6	20.2	-	67.2
2. Resettlement cost	-	-	-	-	-	-
3. Engineering services cost	-	2.7	2.6	2.6	-	7.9
4. Administration cost	-	1.1	2.7	1.5	-	5.3
Total of (1.- 4.)	-	26.3	58.3	33.9	-	118.5
TA1 Taskourt						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	54.7	118.5	164.1	164.2	501.5
1.2 Irrigation facilities	-	-	26.9	67.3	40.4	134.6
2. Resettlement cost	27.0	27.0	-	-	-	54.0
3. Engineering services cost	-	11.8	11.8	11.8	11.6	47.0
4. Administration cost	1.4	4.1	7.3	11.6	10.1	34.5
Total of (1.- 4.)	28.4	97.6	164.5	254.8	226.3	771.6
TA2 Taskourt						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	54.7	118.5	164.1	164.2	501.5
1.2 Irrigation facilities	-	-	69.6	174.1	104.5	348.2
2. Resettlement cost	27.0	27.0	-	-	-	54.0
3. Engineering services cost	-	15.8	15.8	15.8	15.7	63.1
4. Administration cost	1.4	4.1	9.4	16.9	13.4	45.2
Total of (1.- 4.)	28.4	101.6	213.3	370.9	297.8	1,012.0
TA3 Taskourt						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	31.4	68.1	94.3	94.3	288.1
1.2 Irrigation facilities	-	-	26.9	67.3	40.4	134.6
2. Resettlement cost	13.5	13.4	-	-	-	26.9
3. Engineering services cost	-	7.8	7.8	7.8	7.9	31.3
4. Administration cost	0.7	2.2	4.8	8.1	6.7	22.5
Total of (1.- 4.)	14.2	54.8	107.6	177.5	149.3	503.4
TA4 Taskourt						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	31.4	68.1	94.3	94.3	288.1
1.2 Irrigation facilities	-	-	61.5	153.7	92.1	307.3
2. Resettlement cost	13.5	13.4	-	-	-	26.9
3. Engineering services cost	-	11.1	11.1	11.1	11.0	44.3
4. Administration cost	0.7	2.2	6.5	12.4	9.3	31.1
Total of (1.- 4.)	14.2	58.1	147.2	271.5	206.7	697.7

Table XVIII2.2.8 Breakdown of Annual Cost (3/3)
(Economic Price, million DH)

Cost Item	Year in Order					Total cost
	1st	2nd	3rd	4th	5th	
TI1 Timkit						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	28.3	37.7	56.6	47.2	169.8
1.2 Irrigation facilities	-	-	23.0	57.5	34.4	114.9
2. Resettlement cost	3.0	3.0	-	-	-	6.0
3. Engineering services cost	-	5.3	5.3	5.3	5.2	21.1
4. Administration cost	0.2	1.6	3.0	5.7	4.0	14.5
Total of (1.- 4.)	3.2	38.2	69.0	125.1	90.8	326.3
TI2 Timkit						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	28.3	37.7	56.6	47.2	169.8
1.2 Irrigation facilities	-	-	23.0	57.5	34.4	114.9
2. Resettlement cost	3.0	3.0	-	-	-	6.0
3. Engineering services cost	-	5.3	5.3	5.2	5.3	21.1
4. Administration cost	0.2	1.6	3.0	5.7	4.0	14.5
Total of (1.- 4.)	3.2	38.2	69.0	125.0	90.9	326.3
AZ1 Azghar						
1. Construction cost						
1.1 Dam and appurtenant facilities	-	28.6	44.5	44.5	-	117.6
1.2 Irrigation facilities	-	15.0	37.5	22.5	-	75.0
2. Resettlement cost	2.4	2.4	-	-	-	4.8
3. Engineering services cost	-	4.9	4.7	4.7	-	14.3
4. Administration cost	0.1	2.3	4.1	3.4	-	9.9
Total of (1.- 4.)	2.5	53.2	90.8	75.1	-	221.6

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (1/14)

NU1 N'fifikh (Upstream) Unit: million DH

Year in order	Year	Benefit					Cost									Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0	1.6		0.1	1.7	0.0		1.7	-1.7
2	2002	0.0				0.0	35.9	7.5	1.5	4.7	2.2	51.8	0.0		51.8	-51.8
3	2003	0.0				0.0	76.2	18.7		4.6	4.7	104.2	0.0		104.2	-104.2
4	2004	0.0				0.0	37.7	11.1		4.5	2.5	55.8	0.0		55.8	-55.8
5	2005	7.6				7.6						0.0	1.5		1.5	6.1
6	2006	9.9				9.9						0.0	1.5		1.5	8.4
7	2007	12.8				12.8						0.0	1.5		1.5	11.3
8	2008	13.4				13.4						0.0	1.5		1.5	11.9
9	2009	13.5				13.5						0.0	1.5		1.5	12.0
10	2010	13.5				13.5						0.0	1.5		1.5	12.0
11	2011	13.5				13.5						0.0	1.5		1.5	12.0
12	2012	13.5				13.5						0.0	1.5		1.5	12.0
13	2013	13.5				13.5						0.0	1.5		1.5	12.0
14	2014	13.5				13.5						0.0	1.5		1.5	12.0
15	2015	13.5				13.5						0.0	1.5		1.5	12.0
16	2016	13.5				13.5						0.0	1.5		1.5	12.0
17	2017	13.5				13.5						0.0	1.5		1.5	12.0
18	2018	13.5				13.5						0.0	1.5		1.5	12.0
19	2019	13.5				13.5						0.0	1.5		1.5	12.0
20	2020	13.5				13.5						0.0	1.5		1.5	12.0
21	2021	13.5				13.5						0.0	1.5		1.5	12.0
22	2022	13.5				13.5						0.0	1.5		1.5	12.0
23	2023	13.5				13.5						0.0	1.5		1.5	12.0
24	2024	13.5				13.5						0.0	1.5		1.5	12.0
25	2025	13.5				13.5						0.0	1.5		1.5	12.0
26	2026	13.5				13.5						0.0	1.5		1.5	12.0
27	2027	13.5				13.5						0.0	1.5		1.5	12.0
28	2028	13.5				13.5						0.0	1.5		1.5	12.0
29	2029	13.5				13.5						0.0	1.5	11.2	12.7	0.8
30	2030	13.5				13.5						0.0	1.5		1.5	12.0
31	2031	13.5				13.5						0.0	1.5		1.5	12.0
32	2032	13.5				13.5						0.0	1.5		1.5	12.0
33	2033	13.5				13.5						0.0	1.5		1.5	12.0
34	2034	13.5				13.5						0.0	1.5		1.5	12.0
35	2035	13.5				13.5						0.0	1.5		1.5	12.0
36	2036	13.5				13.5						0.0	1.5		1.5	12.0
37	2037	13.5				13.5						0.0	1.5		1.5	12.0
38	2038	13.5				13.5						0.0	1.5		1.5	12.0
39	2039	13.5				13.5						0.0	1.5		1.5	12.0
40	2040	13.5				13.5						0.0	1.5		1.5	12.0
41	2041	13.5				13.5						0.0	1.5		1.5	12.0
42	2042	13.5				13.5						0.0	1.5		1.5	12.0
43	2043	13.5				13.5						0.0	1.5		1.5	12.0
44	2044	13.5				13.5						0.0	1.5		1.5	12.0
45	2045	13.5				13.5						0.0	1.5		1.5	12.0
46	2046	13.5				13.5						0.0	1.5		1.5	12.0
47	2047	13.5				13.5						0.0	1.5		1.5	12.0
48	2048	13.5				13.5						0.0	1.5		1.5	12.0
49	2049	13.5				13.5						0.0	1.5		1.5	12.0
50	2050	13.5				13.5						0.0	1.5		1.5	12.0
51	2051	13.5				13.5						0.0	1.5		1.5	12.0
52	2052	13.5				13.5						0.0	1.5		1.5	12.0
53	2053	13.5				13.5						0.0	1.5		1.5	12.0
54	2054	13.5				13.5						0.0	1.5		1.5	12.0

EIRR=	4.5%		
B/C =	0.62	(at discount rate:	8%)
NPV=	-69.8	(at discount rate:	8%)
NPV=	-39.1	(at discount rate:	6%)
NPV=	-86.3	(at discount rate:	10%)
NPV=	-95.1	(at discount rate:	12%)

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (2/14)

NU2 N'fifikh (Upstream) Unit: million DH

Year in order	Year	Benefit					Cost									Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0	1.6		0.1	1.7	0.0		1.7	-1.7
2	2002	0.0				0.0	35.9	7.7	1.5	2.8	2.2	50.1	0.0		50.1	-50.1
3	2003	0.0				0.0	76.2	19.3		2.8	4.8	103.1	0.0		103.1	-103.1
4	2004	0.0				0.0	37.7	11.5		8.3	2.5	60.0	0.0		60.0	-60.0
5	2005	2.9				2.9						0.0	1.5		1.5	1.4
6	2006	3.7				3.7						0.0	1.5		1.5	2.2
7	2007	4.7				4.7						0.0	1.5		1.5	3.2
8	2008	5.2				5.2						0.0	1.5		1.5	3.7
9	2009	5.4				5.4						0.0	1.5		1.5	3.9
10	2010	5.4				5.4						0.0	1.5		1.5	3.9
11	2011	5.4				5.4						0.0	1.5		1.5	3.9
12	2012	5.4				5.4						0.0	1.5		1.5	3.9
13	2013	5.4				5.4						0.0	1.5		1.5	3.9
14	2014	5.4				5.4						0.0	1.5		1.5	3.9
15	2015	5.4				5.4						0.0	1.5		1.5	3.9
16	2016	5.4				5.4						0.0	1.5		1.5	3.9
17	2017	5.4				5.4						0.0	1.5		1.5	3.9
18	2018	5.4				5.4						0.0	1.5		1.5	3.9
19	2019	5.4				5.4						0.0	1.5		1.5	3.9
20	2020	5.4				5.4						0.0	1.5		1.5	3.9
21	2021	5.4				5.4						0.0	1.5		1.5	3.9
22	2022	5.4				5.4						0.0	1.5		1.5	3.9
23	2023	5.4				5.4						0.0	1.5		1.5	3.9
24	2024	5.4				5.4						0.0	1.5		1.5	3.9
25	2025	5.4				5.4						0.0	1.5		1.5	3.9
26	2026	5.4				5.4						0.0	1.5		1.5	3.9
27	2027	5.4				5.4						0.0	1.5		1.5	3.9
28	2028	5.4				5.4						0.0	1.5		1.5	3.9
29	2029	5.4				5.4						0.0	1.5	11.3	12.9	-7.5
30	2030	5.4				5.4						0.0	1.5		1.5	3.9
31	2031	5.4				5.4						0.0	1.5		1.5	3.9
32	2032	5.4				5.4						0.0	1.5		1.5	3.9
33	2033	5.4				5.4						0.0	1.5		1.5	3.9
34	2034	5.4				5.4						0.0	1.5		1.5	3.9
35	2035	5.4				5.4						0.0	1.5		1.5	3.9
36	2036	5.4				5.4						0.0	1.5		1.5	3.9
37	2037	5.4				5.4						0.0	1.5		1.5	3.9
38	2038	5.4				5.4						0.0	1.5		1.5	3.9
39	2039	5.4				5.4						0.0	1.5		1.5	3.9
40	2040	5.4				5.4						0.0	1.5		1.5	3.9
41	2041	5.4				5.4						0.0	1.5		1.5	3.9
42	2042	5.4				5.4						0.0	1.5		1.5	3.9
43	2043	5.4				5.4						0.0	1.5		1.5	3.9
44	2044	5.4				5.4						0.0	1.5		1.5	3.9
45	2045	5.4				5.4						0.0	1.5		1.5	3.9
46	2046	5.4				5.4						0.0	1.5		1.5	3.9
47	2047	5.4				5.4						0.0	1.5		1.5	3.9
48	2048	5.4				5.4						0.0	1.5		1.5	3.9
49	2049	5.4				5.4						0.0	1.5		1.5	3.9
50	2050	5.4				5.4						0.0	1.5		1.5	3.9
51	2051	5.4				5.4						0.0	1.5		1.5	3.9
52	2052	5.4				5.4						0.0	1.5		1.5	3.9
53	2053	5.4				5.4						0.0	1.5		1.5	3.9
54	2054	5.4				5.4						0.0	1.5		1.5	3.9

EIRR=	-0.7%		
B/C =	0.24	(at discount rate:	8%)
NPV=	-140.1	(at discount rate:	8%)
NPV=	-137.6	(at discount rate:	6%)
NPV=	-138.8	(at discount rate:	10%)
NPV=	-135.6	(at discount rate:	12%)

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (3/14)

NU3 N'fifikh (Upstream)

Unit: million DH

Year in order	Year	Benefit					Cost									Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0	1.6		0.1	1.7	0.0		1.7	-1.7
2	2002	0.0				0.0	35.9	7.5	1.5	4.7	2.2	51.8	0.0		51.8	-51.8
3	2003	0.0				0.0	76.2	18.7		4.6	4.7	104.2	0.0		104.2	-104.2
4	2004	0.0				0.0	37.7	11.1		4.5	2.5	55.8	0.0		55.8	-55.8
5	2005	8.5				8.5						0.0	1.5		1.5	7.0
6	2006	11.5				11.5						0.0	1.5		1.5	10.0
7	2007	14.3				14.3						0.0	1.5		1.5	12.8
8	2008	14.3				14.3						0.0	1.5		1.5	12.8
9	2009	15.4				15.4						0.0	1.5		1.5	13.9
10	2010	15.6				15.6						0.0	1.5		1.5	14.1
11	2011	16.6				16.6						0.0	1.5		1.5	15.1
12	2012	17.7				17.7						0.0	1.5		1.5	16.2
13	2013	17.7				17.7						0.0	1.5		1.5	16.2
14	2014	17.7				17.7						0.0	1.5		1.5	16.2
15	2015	17.7				17.7						0.0	1.5		1.5	16.2
16	2016	17.7				17.7						0.0	1.5		1.5	16.2
17	2017	17.7				17.7						0.0	1.5		1.5	16.2
18	2018	17.7				17.7						0.0	1.5		1.5	16.2
19	2019	17.7				17.7						0.0	1.5		1.5	16.2
20	2020	17.7				17.7						0.0	1.5		1.5	16.2
21	2021	17.7				17.7						0.0	1.5		1.5	16.2
22	2022	17.7				17.7						0.0	1.5		1.5	16.2
23	2023	17.7				17.7						0.0	1.5		1.5	16.2
24	2024	17.7				17.7						0.0	1.5		1.5	16.2
25	2025	17.7				17.7						0.0	1.5		1.5	16.2
26	2026	17.7				17.7						0.0	1.5		1.5	16.2
27	2027	17.7				17.7						0.0	1.5		1.5	16.2
28	2028	17.7				17.7						0.0	1.5		1.5	16.2
29	2029	17.7				17.7						0.0	1.5	11.2	12.7	5.0
30	2030	17.7				17.7						0.0	1.5		1.5	16.2
31	2031	17.7				17.7						0.0	1.5		1.5	16.2
32	2032	17.7				17.7						0.0	1.5		1.5	16.2
33	2033	17.7				17.7						0.0	1.5		1.5	16.2
34	2034	17.7				17.7						0.0	1.5		1.5	16.2
35	2035	17.7				17.7						0.0	1.5		1.5	16.2
36	2036	17.7				17.7						0.0	1.5		1.5	16.2
37	2037	17.7				17.7						0.0	1.5		1.5	16.2
38	2038	17.7				17.7						0.0	1.5		1.5	16.2
39	2039	17.7				17.7						0.0	1.5		1.5	16.2
40	2040	17.7				17.7						0.0	1.5		1.5	16.2
41	2041	17.7				17.7						0.0	1.5		1.5	16.2
42	2042	17.7				17.7						0.0	1.5		1.5	16.2
43	2043	17.7				17.7						0.0	1.5		1.5	16.2
44	2044	17.7				17.7						0.0	1.5		1.5	16.2
45	2045	17.7				17.7						0.0	1.5		1.5	16.2
46	2046	17.7				17.7						0.0	1.5		1.5	16.2
47	2047	17.7				17.7						0.0	1.5		1.5	16.2
48	2048	17.7				17.7						0.0	1.5		1.5	16.2
49	2049	17.7				17.7						0.0	1.5		1.5	16.2
50	2050	17.7				17.7						0.0	1.5		1.5	16.2
51	2051	17.7				17.7						0.0	1.5		1.5	16.2
52	2052	17.7				17.7						0.0	1.5		1.5	16.2
53	2053	17.7				17.7						0.0	1.5		1.5	16.2
54	2054	17.7				17.7						0.0	1.5		1.5	16.2

EIRR= 6.1%
B/C = 0.77 (at discount rate: 8%)
NPV= -41.7 (at discount rate: 8%)

NPV= 2.2 (at discount rate: 6%)
NPV= -66.4 (at discount rate: 10%)
NPV= -80.4 (at discount rate: 12%)

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (4/14)

NU4 N'fifikh (Upstream)

Unit: million DH

Year in order	Year	Benefit					Cost									Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0	1.6		0.1	1.7	0.0		1.7	-1.7
2	2002	0.0				0.0	35.9	17.7	1.5	6.0	2.7	63.8	0.0		63.8	-63.8
3	2003	0.0				0.0	76.2	44.3		5.8	6.0	132.3	0.0		132.3	-132.3
4	2004	0.0				0.0	37.7	26.5		5.9	3.3	73.4	0.0		73.4	-73.4
5	2005	7.8				7.8						0.0	2.5		2.5	5.3
6	2006	9.7				9.7						0.0	2.5		2.5	7.2
7	2007	14.7				14.7						0.0	2.5		2.5	12.1
8	2008	15.6				15.6						0.0	2.5		2.5	13.1
9	2009	15.6				15.6						0.0	2.5		2.5	13.1
10	2010	15.6				15.6						0.0	2.5		2.5	13.1
11	2011	15.6				15.6						0.0	2.5		2.5	13.1
12	2012	15.6				15.6						0.0	2.5		2.5	13.1
13	2013	15.6				15.6						0.0	2.5		2.5	13.1
14	2014	15.6				15.6						0.0	2.5		2.5	13.1
15	2015	15.6				15.6						0.0	2.5		2.5	13.1
16	2016	15.6				15.6						0.0	2.5		2.5	13.1
17	2017	15.6				15.6						0.0	2.5		2.5	13.1
18	2018	15.6				15.6						0.0	2.5		2.5	13.1
19	2019	15.6				15.6						0.0	2.5		2.5	13.1
20	2020	15.6				15.6						0.0	2.5		2.5	13.1
21	2021	15.6				15.6						0.0	2.5		2.5	13.1
22	2022	15.6				15.6						0.0	2.5		2.5	13.1
23	2023	15.6				15.6						0.0	2.5		2.5	13.1
24	2024	15.6				15.6						0.0	2.5		2.5	13.1
25	2025	15.6				15.6						0.0	2.5		2.5	13.1
26	2026	15.6				15.6						0.0	2.5		2.5	13.1
27	2027	15.6				15.6						0.0	2.5		2.5	13.1
28	2028	15.6				15.6						0.0	2.5		2.5	13.1
29	2029	15.6				15.6						0.0	2.5	16.3	18.9	-3.3
30	2030	15.6				15.6						0.0	2.5		2.5	13.1
31	2031	15.6				15.6						0.0	2.5		2.5	13.1
32	2032	15.6				15.6						0.0	2.5		2.5	13.1
33	2033	15.6				15.6						0.0	2.5		2.5	13.1
34	2034	15.6				15.6						0.0	2.5		2.5	13.1
35	2035	15.6				15.6						0.0	2.5		2.5	13.1
36	2036	15.6				15.6						0.0	2.5		2.5	13.1
37	2037	15.6				15.6						0.0	2.5		2.5	13.1
38	2038	15.6				15.6						0.0	2.5		2.5	13.1
39	2039	15.6				15.6						0.0	2.5		2.5	13.1
40	2040	15.6				15.6						0.0	2.5		2.5	13.1
41	2041	15.6				15.6						0.0	2.5		2.5	13.1
42	2042	15.6				15.6						0.0	2.5		2.5	13.1
43	2043	15.6				15.6						0.0	2.5		2.5	13.1
44	2044	15.6				15.6						0.0	2.5		2.5	13.1
45	2045	15.6				15.6						0.0	2.5		2.5	13.1
46	2046	15.6				15.6						0.0	2.5		2.5	13.1
47	2047	15.6				15.6						0.0	2.5		2.5	13.1
48	2048	15.6				15.6						0.0	2.5		2.5	13.1
49	2049	15.6				15.6						0.0	2.5		2.5	13.1
50	2050	15.6				15.6						0.0	2.5		2.5	13.1
51	2051	15.6				15.6						0.0	2.5		2.5	13.1
52	2052	15.6				15.6						0.0	2.5		2.5	13.1
53	2053	15.6				15.6						0.0	2.5		2.5	13.1
54	2054	15.6				15.6						0.0	2.5		2.5	13.1

EIRR= 3.6%
B/C = 0.55 (at discount rate: 8%)
NPV= -109.0 (at discount rate: 8%)

NPV= -77.9 (at discount rate: 6%)
NPV= -124.9 (at discount rate: 10%)
NPV= -132.6 (at discount rate: 12%)

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (5/14)

NU5 N'fifikh (Upstream)

Unit: million DH

Year in order	Year	Benefit					Cost									Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0	1.6		0.1	1.7	0.0		1.7	-1.7
2	2002	0.0				0.0	35.9	7.6	1.5	4.7	2.2	51.9	0.0		51.9	-51.9
3	2003	0.0				0.0	76.2	18.9		4.6	4.8	104.5	0.0		104.5	-104.5
4	2004	0.0				0.0	37.7	11.3		4.6	2.4	56.0	0.0		56.0	-56.0
5	2005	6.8				6.8						0.0	2.6		2.6	4.2
6	2006	8.4				8.4						0.0	2.6		2.6	5.8
7	2007	12.7				12.7						0.0	2.6		2.6	10.1
8	2008	13.5				13.5						0.0	2.6		2.6	10.9
9	2009	13.5				13.5						0.0	2.6		2.6	10.9
10	2010	13.5				13.5						0.0	2.6		2.6	10.9
11	2011	13.5				13.5						0.0	2.6		2.6	10.9
12	2012	13.5				13.5						0.0	2.6		2.6	10.9
13	2013	13.5				13.5						0.0	2.6		2.6	10.9
14	2014	13.5				13.5						0.0	2.6		2.6	10.9
15	2015	13.5				13.5						0.0	2.6		2.6	10.9
16	2016	13.5				13.5						0.0	2.6		2.6	10.9
17	2017	13.5				13.5						0.0	2.6		2.6	10.9
18	2018	13.5				13.5						0.0	2.6		2.6	10.9
19	2019	13.5				13.5						0.0	2.6		2.6	10.9
20	2020	13.5				13.5						0.0	2.6		2.6	10.9
21	2021	13.5				13.5						0.0	2.6		2.6	10.9
22	2022	13.5				13.5						0.0	2.6		2.6	10.9
23	2023	13.5				13.5						0.0	2.6		2.6	10.9
24	2024	13.5				13.5						0.0	2.6		2.6	10.9
25	2025	13.5				13.5						0.0	2.6		2.6	10.9
26	2026	13.5				13.5						0.0	2.6		2.6	10.9
27	2027	13.5				13.5						0.0	2.6		2.6	10.9
28	2028	13.5				13.5						0.0	2.6		2.6	10.9
29	2029	13.5				13.5						0.0	2.6	11.3	13.8	-0.3
30	2030	13.5				13.5						0.0	2.6		2.6	10.9
31	2031	13.5				13.5						0.0	2.6		2.6	10.9
32	2032	13.5				13.5						0.0	2.6		2.6	10.9
33	2033	13.5				13.5						0.0	2.6		2.6	10.9
34	2034	13.5				13.5						0.0	2.6		2.6	10.9
35	2035	13.5				13.5						0.0	2.6		2.6	10.9
36	2036	13.5				13.5						0.0	2.6		2.6	10.9
37	2037	13.5				13.5						0.0	2.6		2.6	10.9
38	2038	13.5				13.5						0.0	2.6		2.6	10.9
39	2039	13.5				13.5						0.0	2.6		2.6	10.9
40	2040	13.5				13.5						0.0	2.6		2.6	10.9
41	2041	13.5				13.5						0.0	2.6		2.6	10.9
42	2042	13.5				13.5						0.0	2.6		2.6	10.9
43	2043	13.5				13.5						0.0	2.6		2.6	10.9
44	2044	13.5				13.5						0.0	2.6		2.6	10.9
45	2045	13.5				13.5						0.0	2.6		2.6	10.9
46	2046	13.5				13.5						0.0	2.6		2.6	10.9
47	2047	13.5				13.5						0.0	2.6		2.6	10.9
48	2048	13.5				13.5						0.0	2.6		2.6	10.9
49	2049	13.5				13.5						0.0	2.6		2.6	10.9
50	2050	13.5				13.5						0.0	2.6		2.6	10.9
51	2051	13.5				13.5						0.0	2.6		2.6	10.9
52	2052	13.5				13.5						0.0	2.6		2.6	10.9
53	2053	13.5				13.5						0.0	2.6		2.6	10.9
54	2054	13.5				13.5						0.0	2.6		2.6	10.9

EIRR= 3.9%
B/C = 0.58 (at discount rate: 8%)
NPV= -81.3 (at discount rate: 8%)
NPV= -54.5 (at discount rate: 6%)
NPV= -95.3 (at discount rate: 10%)
NPV= -102.3 (at discount rate: 12%)

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (6/14)

ND1 N'fifikh (Downstream)

Unit: million DH

Year in order	Year	Benefit					Cost									Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0				0.0	0.0		0.0	0.0
2	2002	0.0				0.0	1.5	5.9		0.9	0.4	8.7	0.0		8.7	-8.7
3	2003	0.0				0.0	3.1	14.8		0.9	0.9	19.7	0.0		19.7	-19.7
4	2004	0.0				0.0	1.6	8.9		0.9	0.5	11.9	0.0		11.9	-11.9
5	2005	0.6				0.6						0.0	0.8		0.8	-0.2
6	2006	1.7				1.7						0.0	0.8		0.8	0.9
7	2007	2.4				2.4						0.0	0.8		0.8	1.6
8	2008	3.0				3.0						0.0	0.8		0.8	2.2
9	2009	3.2				3.2						0.0	0.8		0.8	2.4
10	2010	3.2				3.2						0.0	0.8		0.8	2.4
11	2011	3.2				3.2						0.0	0.8		0.8	2.4
12	2012	3.2				3.2						0.0	0.8		0.8	2.4
13	2013	3.2				3.2						0.0	0.8		0.8	2.4
14	2014	3.2				3.2						0.0	0.8		0.8	2.4
15	2015	3.2				3.2						0.0	0.8		0.8	2.4
16	2016	3.2				3.2						0.0	0.8		0.8	2.4
17	2017	3.2				3.2						0.0	0.8		0.8	2.4
18	2018	3.2				3.2						0.0	0.8		0.8	2.4
19	2019	3.2				3.2						0.0	0.8		0.8	2.4
20	2020	3.2				3.2						0.0	0.8		0.8	2.4
21	2021	3.2				3.2						0.0	0.8		0.8	2.4
22	2022	3.2				3.2						0.0	0.8		0.8	2.4
23	2023	3.2				3.2						0.0	0.8		0.8	2.4
24	2024	3.2				3.2						0.0	0.8		0.8	2.4
25	2025	3.2				3.2						0.0	0.8		0.8	2.4
26	2026	3.2				3.2						0.0	0.8		0.8	2.4
27	2027	3.2				3.2						0.0	0.8		0.8	2.4
28	2028	3.2				3.2						0.0	0.8		0.8	2.4
29	2029	3.2				3.2						0.0	0.8	3.3	4.1	-0.9
30	2030	3.2				3.2						0.0	0.8		0.8	2.4
31	2031	3.2				3.2						0.0	0.8		0.8	2.4
32	2032	3.2				3.2						0.0	0.8		0.8	2.4
33	2033	3.2				3.2						0.0	0.8		0.8	2.4
34	2034	3.2				3.2						0.0	0.8		0.8	2.4
35	2035	3.2				3.2						0.0	0.8		0.8	2.4
36	2036	3.2				3.2						0.0	0.8		0.8	2.4
37	2037	3.2				3.2						0.0	0.8		0.8	2.4
38	2038	3.2				3.2						0.0	0.8		0.8	2.4
39	2039	3.2				3.2						0.0	0.8		0.8	2.4
40	2040	3.2				3.2						0.0	0.8		0.8	2.4
41	2041	3.2				3.2						0.0	0.8		0.8	2.4
42	2042	3.2				3.2						0.0	0.8		0.8	2.4
43	2043	3.2				3.2						0.0	0.8		0.8	2.4
44	2044	3.2				3.2						0.0	0.8		0.8	2.4
45	2045	3.2				3.2						0.0	0.8		0.8	2.4
46	2046	3.2				3.2						0.0	0.8		0.8	2.4
47	2047	3.2				3.2						0.0	0.8		0.8	2.4
48	2048	3.2				3.2						0.0	0.8		0.8	2.4
49	2049	3.2				3.2						0.0	0.8		0.8	2.4
50	2050	3.2				3.2						0.0	0.8		0.8	2.4
51	2051	3.2				3.2						0.0	0.8		0.8	2.4
52	2052	3.2				3.2						0.0	0.8		0.8	2.4
53	2053	3.2				3.2						0.0	0.8		0.8	2.4
54	2054	3.2				3.2						0.0	0.8		0.8	2.4

EIRR= 4.5%
B/C = 0.65 (at discount rate: 8%)
NPV= -13.9 (at discount rate: 8%)
NPV= -8.0 (at discount rate: 6%)
NPV= -17.0 (at discount rate: 10%)
NPV= -18.6 (at discount rate: 12%)

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (7/14)

ND2 N'fifikh (Downstream)

Unit: million DH

Year in order	Year	Benefit					Cost									Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0				0.0	0.0		0.0	0.0
2	2002	0.0				0.0	9.1	13.4		2.7	1.1	26.3	0.0		26.3	-26.3
3	2003	0.0				0.0	19.4	33.6		2.6	2.7	58.3	0.0		58.3	-58.3
4	2004	0.0				0.0	9.6	20.2		2.6	1.5	33.9	0.0		33.9	-33.9
5	2005	1.3				1.3						0.0	1.9		1.9	-0.6
6	2006	3.7				3.7						0.0	1.9		1.9	1.8
7	2007	5.3				5.3						0.0	1.9		1.9	3.3
8	2008	6.7				6.7						0.0	1.9		1.9	4.7
9	2009	7.1				7.1						0.0	1.9		1.9	5.2
10	2010	7.1				7.1						0.0	1.9		1.9	5.2
11	2011	7.1				7.1						0.0	1.9		1.9	5.2
12	2012	7.1				7.1						0.0	1.9		1.9	5.2
13	2013	7.1				7.1						0.0	1.9		1.9	5.2
14	2014	7.1				7.1						0.0	1.9		1.9	5.2
15	2015	7.1				7.1						0.0	1.9		1.9	5.2
16	2016	7.1				7.1						0.0	1.9		1.9	5.2
17	2017	7.1				7.1						0.0	1.9		1.9	5.2
18	2018	7.1				7.1						0.0	1.9		1.9	5.2
19	2019	7.1				7.1						0.0	1.9		1.9	5.2
20	2020	7.1				7.1						0.0	1.9		1.9	5.2
21	2021	7.1				7.1						0.0	1.9		1.9	5.2
22	2022	7.1				7.1						0.0	1.9		1.9	5.2
23	2023	7.1				7.1						0.0	1.9		1.9	5.2
24	2024	7.1				7.1						0.0	1.9		1.9	5.2
25	2025	7.1				7.1						0.0	1.9		1.9	5.2
26	2026	7.1				7.1						0.0	1.9		1.9	5.2
27	2027	7.1				7.1						0.0	1.9		1.9	5.2
28	2028	7.1				7.1						0.0	1.9		1.9	5.2
29	2029	7.1				7.1						0.0	1.9	8.6	10.5	-3.4
30	2030	7.1				7.1						0.0	1.9		1.9	5.2
31	2031	7.1				7.1						0.0	1.9		1.9	5.2
32	2032	7.1				7.1						0.0	1.9		1.9	5.2
33	2033	7.1				7.1						0.0	1.9		1.9	5.2
34	2034	7.1				7.1						0.0	1.9		1.9	5.2
35	2035	7.1				7.1						0.0	1.9		1.9	5.2
36	2036	7.1				7.1						0.0	1.9		1.9	5.2
37	2037	7.1				7.1						0.0	1.9		1.9	5.2
38	2038	7.1				7.1						0.0	1.9		1.9	5.2
39	2039	7.1				7.1						0.0	1.9		1.9	5.2
40	2040	7.1				7.1						0.0	1.9		1.9	5.2
41	2041	7.1				7.1						0.0	1.9		1.9	5.2
42	2042	7.1				7.1						0.0	1.9		1.9	5.2
43	2043	7.1				7.1						0.0	1.9		1.9	5.2
44	2044	7.1				7.1						0.0	1.9		1.9	5.2
45	2045	7.1				7.1						0.0	1.9		1.9	5.2
46	2046	7.1				7.1						0.0	1.9		1.9	5.2
47	2047	7.1				7.1						0.0	1.9		1.9	5.2
48	2048	7.1				7.1						0.0	1.9		1.9	5.2
49	2049	7.1				7.1						0.0	1.9		1.9	5.2
50	2050	7.1				7.1						0.0	1.9		1.9	5.2
51	2051	7.1				7.1						0.0	1.9		1.9	5.2
52	2052	7.1				7.1						0.0	1.9		1.9	5.2
53	2053	7.1				7.1						0.0	1.9		1.9	5.2
54	2054	7.1				7.1						0.0	1.9		1.9	5.2

EIRR= 2.9%
B/C = 0.50 (at discount rate: 8%)
NPV= -55.5 (at discount rate: 8%)
NPV= -44.4 (at discount rate: 6%)
NPV= -60.8 (at discount rate: 10%)
NPV= -63.0 (at discount rate: 12%)

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (8/14)

TA1 Taskourt

Unit: million DH

Year in order	Year	Benefit					Cost									Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0	27.0		1.3	28.3	0.0		28.3	-28.3
2	2002	0.0				0.0	54.7	0.0	27.0	11.8	4.1	97.6	0.0		97.6	-97.6
3	2003	0.0				0.0	118.5	26.9		11.8	7.3	164.5	0.0		164.5	-164.5
4	2004	0.0				0.0	164.1	67.3		11.8	11.6	254.8	0.0		254.8	-254.8
5	2005	0.0				0.0	164.2	40.4		11.6	10.1	226.3	0.0		226.3	-226.3
6	2006	38.0				38.0						0.0	5.2		5.2	32.8
7	2007	51.5				51.5						0.0	5.2		5.2	46.3
8	2008	60.7				60.7						0.0	5.2		5.2	55.5
9	2009	68.5				68.5						0.0	5.2		5.2	63.3
10	2010	73.9				73.9						0.0	5.2		5.2	68.7
11	2011	73.9				73.9						0.0	5.2		5.2	68.7
12	2012	73.9				73.9						0.0	5.2		5.2	68.7
13	2013	73.9				73.9						0.0	5.2		5.2	68.7
14	2014	73.9				73.9						0.0	5.2		5.2	68.7
15	2015	73.9				73.9						0.0	5.2		5.2	68.7
16	2016	73.9				73.9						0.0	5.2		5.2	68.7
17	2017	73.9				73.9						0.0	5.2		5.2	68.7
18	2018	73.9				73.9						0.0	5.2		5.2	68.7
19	2019	73.9				73.9						0.0	5.2		5.2	68.7
20	2020	73.9				73.9						0.0	5.2		5.2	68.7
21	2021	73.9				73.9						0.0	5.2		5.2	68.7
22	2022	73.9				73.9						0.0	5.2		5.2	68.7
23	2023	73.9				73.9						0.0	5.2		5.2	68.7
24	2024	73.9				73.9						0.0	5.2		5.2	68.7
25	2025	73.9				73.9						0.0	5.2		5.2	68.7
26	2026	73.9				73.9						0.0	5.2		5.2	68.7
27	2027	73.9				73.9						0.0	5.2		5.2	68.7
28	2028	73.9				73.9						0.0	5.2		5.2	68.7
29	2029	73.9				73.9						0.0	5.2		5.2	68.7
30	2030	73.9				73.9						0.0	5.2	38.5	43.7	30.2
31	2031	73.9				73.9						0.0	5.2		5.2	68.7
32	2032	73.9				73.9						0.0	5.2		5.2	68.7
33	2033	73.9				73.9						0.0	5.2		5.2	68.7
34	2034	73.9				73.9						0.0	5.2		5.2	68.7
35	2035	73.9				73.9						0.0	5.2		5.2	68.7
36	2036	73.9				73.9						0.0	5.2		5.2	68.7
37	2037	73.9				73.9						0.0	5.2		5.2	68.7
38	2038	73.9				73.9						0.0	5.2		5.2	68.7
39	2039	73.9				73.9						0.0	5.2		5.2	68.7
40	2040	73.9				73.9						0.0	5.2		5.2	68.7
41	2041	73.9				73.9						0.0	5.2		5.2	68.7
42	2042	73.9				73.9						0.0	5.2		5.2	68.7
43	2043	73.9				73.9						0.0	5.2		5.2	68.7
44	2044	73.9				73.9						0.0	5.2		5.2	68.7
45	2045	73.9				73.9						0.0	5.2		5.2	68.7
46	2046	73.9				73.9						0.0	5.2		5.2	68.7
47	2047	73.9				73.9						0.0	5.2		5.2	68.7
48	2048	73.9				73.9						0.0	5.2		5.2	68.7
49	2049	73.9				73.9						0.0	5.2		5.2	68.7
50	2050	73.9				73.9						0.0	5.2		5.2	68.7
51	2051	73.9				73.9						0.0	5.2		5.2	68.7
52	2052	73.9				73.9						0.0	5.2		5.2	68.7
53	2053	73.9				73.9						0.0	5.2		5.2	68.7
54	2054	73.9				73.9						0.0	5.2		5.2	68.7
55	2055	73.9				73.9						0.0	5.2		5.2	68.7

EIRR= 7.2%
B/C = 0.91 (at discount rate: 8%)
NPV= -59.1 (at discount rate: 8%)
NPV= 128.2 (at discount rate: 6%)
NPV= -164.0 (at discount rate: 10%)
NPV= -223.6 (at discount rate: 12%)

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (9/14)

TA2 Taskourt

Unit: million DH

Year in order	Year	Benefit					Cost								Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0	27.0		1.3	28.3	0.0		28.3	-28.3
2	2002	0.0				0.0	54.7	0.0	27.0	15.8	4.1	101.6	0.0		101.6	-101.6
3	2003	0.0				0.0	118.5	69.6		15.8	9.4	213.3	0.0		213.3	-213.3
4	2004	0.0				0.0	164.1	174.1		15.8	16.9	370.9	0.0		370.9	-370.9
5	2005	0.0				0.0	164.2	104.5		15.7	13.4	297.8	0.0		297.8	-297.8
6	2006	44.3				44.3						0.0	9.5		9.5	34.8
7	2007	60.2				60.2						0.0	9.5		9.5	50.7
8	2008	71.1				71.1						0.0	9.5		9.5	61.6
9	2009	80.3				80.3						0.0	9.5		9.5	70.8
10	2010	86.7				86.7						0.0	9.5		9.5	77.2
11	2011	86.7				86.7						0.0	9.5		9.5	77.2
12	2012	86.7				86.7						0.0	9.5		9.5	77.2
13	2013	86.7				86.7						0.0	9.5		9.5	77.2
14	2014	86.7				86.7						0.0	9.5		9.5	77.2
15	2015	86.7				86.7						0.0	9.5		9.5	77.2
16	2016	86.7				86.7						0.0	9.5		9.5	77.2
17	2017	86.7				86.7						0.0	9.5		9.5	77.2
18	2018	86.7				86.7						0.0	9.5		9.5	77.2
19	2019	86.7				86.7						0.0	9.5		9.5	77.2
20	2020	86.7				86.7						0.0	9.5		9.5	77.2
21	2021	86.7				86.7						0.0	9.5		9.5	77.2
22	2022	86.7				86.7						0.0	9.5		9.5	77.2
23	2023	86.7				86.7						0.0	9.5		9.5	77.2
24	2024	86.7				86.7						0.0	9.5		9.5	77.2
25	2025	86.7				86.7						0.0	9.5		9.5	77.2
26	2026	86.7				86.7						0.0	9.5		9.5	77.2
27	2027	86.7				86.7						0.0	9.5		9.5	77.2
28	2028	86.7				86.7						0.0	9.5		9.5	77.2
29	2029	86.7				86.7						0.0	9.5		9.5	77.2
30	2030	86.7				86.7						0.0	9.5	59.9	69.4	17.3
31	2031	86.7				86.7						0.0	9.5		9.5	77.2
32	2032	86.7				86.7						0.0	9.5		9.5	77.2
33	2033	86.7				86.7						0.0	9.5		9.5	77.2
34	2034	86.7				86.7						0.0	9.5		9.5	77.2
35	2035	86.7				86.7						0.0	9.5		9.5	77.2
36	2036	86.7				86.7						0.0	9.5		9.5	77.2
37	2037	86.7				86.7						0.0	9.5		9.5	77.2
38	2038	86.7				86.7						0.0	9.5		9.5	77.2
39	2039	86.7				86.7						0.0	9.5		9.5	77.2
40	2040	86.7				86.7						0.0	9.5		9.5	77.2
41	2041	86.7				86.7						0.0	9.5		9.5	77.2
42	2042	86.7				86.7						0.0	9.5		9.5	77.2
43	2043	86.7				86.7						0.0	9.5		9.5	77.2
44	2044	86.7				86.7						0.0	9.5		9.5	77.2
45	2045	86.7				86.7						0.0	9.5		9.5	77.2
46	2046	86.7				86.7						0.0	9.5		9.5	77.2
47	2047	86.7				86.7						0.0	9.5		9.5	77.2
48	2048	86.7				86.7						0.0	9.5		9.5	77.2
49	2049	86.7				86.7						0.0	9.5		9.5	77.2
50	2050	86.7				86.7						0.0	9.5		9.5	77.2
51	2051	86.7				86.7						0.0	9.5		9.5	77.2
52	2052	86.7				86.7						0.0	9.5		9.5	77.2
53	2053	86.7				86.7						0.0	9.5		9.5	77.2
54	2054	86.7				86.7						0.0	9.5		9.5	77.2
55	2055	86.7				86.7						0.0	9.5		9.5	77.2

EIRR= 6.2%
B/C = 0.79 (at discount rate: 8%)
NPV= -174.7 (at discount rate: 8%)
NPV= 25.5 (at discount rate: 6%)
NPV= -283.7 (at discount rate: 10%)
NPV= -343.0 (at discount rate: 12%)

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (10/14)

TA3 Taskourt

Unit: million DH

Year in order	Year	Benefit					Cost								Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0	13.5		1.2	14.7	0.0		14.7	-14.7
2	2002	0.0				0.0	31.4	0.0	13.4	7.8	2.7	55.3	0.0		55.3	-55.3
3	2003	0.0				0.0	68.1	26.9		7.8	4.8	107.6	0.0		107.6	-107.6
4	2004	0.0				0.0	94.3	67.3		7.8	8.1	177.5	0.0		177.5	-177.5
5	2005	0.0				0.0	94.3	40.4		7.9	6.7	149.3	0.0		149.3	-149.3
6	2006	25.8				25.8						0.0	4.1		4.1	21.7
7	2007	34.6				34.6						0.0	4.1		4.1	30.5
8	2008	40.7				40.7						0.0	4.1		4.1	36.5
9	2009	45.7				45.7						0.0	4.1		4.1	41.6
10	2010	49.1				49.1						0.0	4.1		4.1	45.0
11	2011	49.1				49.1						0.0	4.1		4.1	45.0
12	2012	49.1				49.1						0.0	4.1		4.1	45.0
13	2013	49.1				49.1						0.0	4.1		4.1	45.0
14	2014	49.1				49.1						0.0	4.1		4.1	45.0
15	2015	49.1				49.1						0.0	4.1		4.1	45.0
16	2016	49.1				49.1						0.0	4.1		4.1	45.0
17	2017	49.1				49.1						0.0	4.1		4.1	45.0
18	2018	49.1				49.1						0.0	4.1		4.1	45.0
19	2019	49.1				49.1						0.0	4.1		4.1	45.0
20	2020	49.1				49.1						0.0	4.1		4.1	45.0
21	2021	49.1				49.1						0.0	4.1		4.1	45.0
22	2022	49.1				49.1						0.0	4.1		4.1	45.0
23	2023	49.1				49.1						0.0	4.1		4.1	45.0
24	2024	49.1				49.1						0.0	4.1		4.1	45.0
25	2025	49.1				49.1						0.0	4.1		4.1	45.0
26	2026	49.1				49.1						0.0	4.1		4.1	45.0
27	2027	49.1				49.1						0.0	4.1		4.1	45.0
28	2028	49.1				49.1						0.0	4.1		4.1	45.0
29	2029	49.1				49.1						0.0	4.1		4.1	45.0
30	2030	49.1				49.1						0.0	4.1	27.9	32.0	17.1
31	2031	49.1				49.1						0.0	4.1		4.1	45.0
32	2032	49.1				49.1						0.0	4.1		4.1	45.0
33	2033	49.1				49.1						0.0	4.1		4.1	45.0
34	2034	49.1				49.1						0.0	4.1		4.1	45.0
35	2035	49.1				49.1						0.0	4.1		4.1	45.0
36	2036	49.1				49.1						0.0	4.1		4.1	45.0
37	2037	49.1				49.1						0.0	4.1		4.1	45.0
38	2038	49.1				49.1						0.0	4.1		4.1	45.0
39	2039	49.1				49.1						0.0	4.1		4.1	45.0
40	2040	49.1				49.1						0.0	4.1		4.1	45.0
41	2041	49.1				49.1						0.0	4.1		4.1	45.0
42	2042	49.1				49.1						0.0	4.1		4.1	45.0
43	2043	49.1				49.1						0.0	4.1		4.1	45.0
44	2044	49.1				49.1						0.0	4.1		4.1	45.0
45	2045	49.1				49.1						0.0	4.1		4.1	45.0
46	2046	49.1				49.1						0.0	4.1		4.1	45.0
47	2047	49.1				49.1						0.0	4.1		4.1	45.0
48	2048	49.1				49.1						0.0	4.1		4.1	45.0
49	2049	49.1				49.1						0.0	4.1		4.1	45.0
50	2050	49.1				49.1						0.0	4.1		4.1	45.0
51	2051	49.1				49.1						0.0	4.1		4.1	45.0
52	2052	49.1				49.1						0.0	4.1		4.1	45.0
53	2053	49.1				49.1						0.0	4.1		4.1	45.0
54	2054	49.1				49.1						0.0	4.1		4.1	45.0
55	2055	49.1				49.1						0.0	4.1		4.1	45.0

EIRR= 7.3%
B/C = 0.91 (at discount rate: 8%)
NPV= -36.2 (at discount rate: 8%)
NPV= 85.9 (at discount rate: 6%)
NPV= -104.5 (at discount rate: 10%)
NPV= -143.3 (at discount rate: 12%)

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (11/14)

TA4 Taskourt

Unit: million DH

Year in order	Year	Benefit					Cost									Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0	13.5		1.2	14.7	0.0		14.7	-14.7
2	2002	0.0				0.0	31.4	0.0	13.4	11.1	2.7	58.6	0.0		58.6	-58.6
3	2003	0.0				0.0	68.1	61.5		11.1	6.5	147.2	0.0		147.2	-147.2
4	2004	0.0				0.0	94.3	153.7		11.1	12.4	271.5	0.0		271.5	-271.5
5	2005	0.0				0.0	94.3	92.1		11.0	9.3	206.7	0.0		206.7	-206.7
6	2006	30.3				30.3						0.0	7.6		7.6	22.8
7	2007	40.9				40.9						0.0	7.6		7.6	33.3
8	2008	48.1				48.1						0.0	7.6		7.6	40.5
9	2009	54.2				54.2						0.0	7.6		7.6	46.6
10	2010	58.3				58.3						0.0	7.6		7.6	50.7
11	2011	58.3				58.3						0.0	7.6		7.6	50.7
12	2012	58.3				58.3						0.0	7.6		7.6	50.7
13	2013	58.3				58.3						0.0	7.6		7.6	50.7
14	2014	58.3				58.3						0.0	7.6		7.6	50.7
15	2015	58.3				58.3						0.0	7.6		7.6	50.7
16	2016	58.3				58.3						0.0	7.6		7.6	50.7
17	2017	58.3				58.3						0.0	7.6		7.6	50.7
18	2018	58.3				58.3						0.0	7.6		7.6	50.7
19	2019	58.3				58.3						0.0	7.6		7.6	50.7
20	2020	58.3				58.3						0.0	7.6		7.6	50.7
21	2021	58.3				58.3						0.0	7.6		7.6	50.7
22	2022	58.3				58.3						0.0	7.6		7.6	50.7
23	2023	58.3				58.3						0.0	7.6		7.6	50.7
24	2024	58.3				58.3						0.0	7.6		7.6	50.7
25	2025	58.3				58.3						0.0	7.6		7.6	50.7
26	2026	58.3				58.3						0.0	7.6		7.6	50.7
27	2027	58.3				58.3						0.0	7.6		7.6	50.7
28	2028	58.3				58.3						0.0	7.6		7.6	50.7
29	2029	58.3				58.3						0.0	7.6		7.6	50.7
30	2030	58.3				58.3						0.0	7.6	45.1	52.7	5.6
31	2031	58.3				58.3						0.0	7.6		7.6	50.7
32	2032	58.3				58.3						0.0	7.6		7.6	50.7
33	2033	58.3				58.3						0.0	7.6		7.6	50.7
34	2034	58.3				58.3						0.0	7.6		7.6	50.7
35	2035	58.3				58.3						0.0	7.6		7.6	50.7
36	2036	58.3				58.3						0.0	7.6		7.6	50.7
37	2037	58.3				58.3						0.0	7.6		7.6	50.7
38	2038	58.3				58.3						0.0	7.6		7.6	50.7
39	2039	58.3				58.3						0.0	7.6		7.6	50.7
40	2040	58.3				58.3						0.0	7.6		7.6	50.7
41	2041	58.3				58.3						0.0	7.6		7.6	50.7
42	2042	58.3				58.3						0.0	7.6		7.6	50.7
43	2043	58.3				58.3						0.0	7.6		7.6	50.7
44	2044	58.3				58.3						0.0	7.6		7.6	50.7
45	2045	58.3				58.3						0.0	7.6		7.6	50.7
46	2046	58.3				58.3						0.0	7.6		7.6	50.7
47	2047	58.3				58.3						0.0	7.6		7.6	50.7
48	2048	58.3				58.3						0.0	7.6		7.6	50.7
49	2049	58.3				58.3						0.0	7.6		7.6	50.7
50	2050	58.3				58.3						0.0	7.6		7.6	50.7
51	2051	58.3				58.3						0.0	7.6		7.6	50.7
52	2052	58.3				58.3						0.0	7.6		7.6	50.7
53	2053	58.3				58.3						0.0	7.6		7.6	50.7
54	2054	58.3				58.3						0.0	7.6		7.6	50.7
55	2055	58.3				58.3						0.0	7.6		7.6	50.7

EIRR=	5.9%			
B/C =	0.76	(at discount rate:	8%)	
NPV=	-138.5	(at discount rate:	8%)	
NPV=	-9.8	(at discount rate:	6%)	
NPV=	-207.8	(at discount rate:	10%)	
NPV=	-244.6	(at discount rate:	12%)	

Table XVIII2.2.9: Cost-Benefit Analysis of the Irrigation Alternative Plans (12/14)

TI1 Timkit

Unit: million DH

Year in order	Year	Benefit					Cost									Net Cash Flow
							Investment						O/M	Replace-ment	Total Cost	
		Agriculture	Water supply	Flood & erosion control	Other	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Administra-tion	Sub-total				
1	2001	0.0				0.0	0.0	0.0	3.0		0.1	3.1	0.0		3.1	-3.1
2	2002	0.0				0.0	28.3	0.0	3.0	5.3	1.6	38.2	0.0		38.2	-38.2
3	2003	0.0				0.0	37.7	23.0		5.3	3.0	69.0	0.0		69.0	-69.0
4	2004	0.0				0.0	56.6	57.5		5.3	5.7	125.1	0.0		125.1	-125.1
5	2005	0.0				0.0	47.2	34.4		5.2	4.1	90.9	0.0		90.9	-90.9
6	2006	15.6				15.6						0.0	3.5		3.5	12.1
7	2007	21.7				21.7						0.0	3.5		3.5	18.2
8	2008	25.2				25.2						0.0	3.5		3.5	21.7
9	2009	27.1				27.1						0.0	3.5		3.5	23.6
10	2010	28.1				28.1						0.0	3.5		3.5	24.6
11	2011	28.1				28.1						0.0	3.5		3.5	24.6
12	2012	28.1				28.1						0.0	3.5		3.5	24.6
13	2013	28.1				28.1						0.0	3.5		3.5	24.6
14	2014	28.1				28.1						0.0	3.5		3.5	24.6
15	2015	28.1				28.1						0.0	3.5		3.5	24.6
16	2016	28.1				28.1						0.0	3.5		3.5	24.6
17	2017	28.1				28.1						0.0	3.5		3.5	24.6
18	2018	28.1				28.1						0.0	3.5		3.5	24.6
19	2019	28.1				28.1						0.0	3.5		3.5	24.6
20	2020	28.1				28.1						0.0	3.5		3.5	24.6
21	2021	28.1				28.1						0.0	3.5		3.5	24.6
22	2022	28.1				28.1						0.0	3.5		3.5	24.6
23	2023	28.1				28.1						0.0	3.5		3.5	24.6
24	2024	28.1				28.1						0.0	3.5		3.5	24.6
25	2025	28.1				28.1						0.0	3.5		3.5	24.6
26	2026	28.1				28.1						0.0	3.5		3.5	24.6
27	2027	28.1				28.1						0.0	3.5		3.5	24.6
28	2028	28.1				28.1						0.0	3.5		3.5	24.6
29	2029	28.1				28.1						0.0	3.5		3.5	24.6
30	2030	28.1				28.1						0.0	3.5	20.0	23.5	4.6
31	2031	28.1				28.1						0.0	3.5		3.5	24.6
32	2032	28.1				28.1						0.0	3.5		3.5	24.6
33	2033	28.1				28.1						0.0	3.5		3.5	24.6
34	2034	28.1				28.1						0.0	3.5		3.5	24.6
35	2035	28.1				28.1						0.0	3.5		3.5	24.6
36	2036	28.1				28.1						0.0	3.5		3.5	24.6
37	2037	28.1				28.1						0.0	3.5		3.5	24.6
38	2038	28.1				28.1						0.0	3.5		3.5	24.6
39	2039	28.1				28.1						0.0	3.5		3.5	24.6
40	2040	28.1				28.1						0.0	3.5		3.5	24.6
41	2041	28.1				28.1						0.0	3.5		3.5	24.6
42	2042	28.1				28.1						0.0	3.5		3.5	24.6
43	2043	28.1				28.1						0.0	3.5		3.5	24.6
44	2044	28.1				28.1						0.0	3.5		3.5	24.6
45	2045	28.1				28.1						0.0	3.5		3.5	24.6
46	2046	28.1				28.1						0.0	3.5		3.5	24.6
47	2047	28.1				28.1						0.0	3.5		3.5	24.6
48	2048	28.1				28.1						0.0	3.5		3.5	24.6
49	2049	28.1				28.1						0.0	3.5		3.5	24.6
50	2050	28.1				28.1						0.0	3.5		3.5	24.6
51	2051	28.1				28.1						0.0	3.5		3.5	24.6
52	2052	28.1				28.1						0.0	3.5		3.5	24.6
53	2053	28.1				28.1						0.0	3.5		3.5	24.6
54	2054	28.1				28.1						0.0	3.5		3.5	24.6
55	2055	28.1				28.1						0.0	3.5		3.5	24.6

EIRR=	6.2%			
B/C =	0.80	(at discount rate:	8%)	
NPV=	-55.1	(at discount rate:	8%)	
NPV=	8.9	(at discount rate:	6%)	
NPV=	-89.9	(at discount rate:	10%)	
NPV=	-108.9	(at discount rate:	12%)	

Table XVIII2.2.10: Results of Economic Evaluation of Irrigation Alternative Plans (Agricultural Benefit Only)

Project	Alter-native	EIRR	B/C	NPV (Unit: Million DH)				Remarks
			DR=8%	DR=6%	DR=8%	DR=10%	DR=12%	
N'fifikh (upstream)	**NU1**	4.5%	0.62	-39.1	-69.8	-86.3	-95.1	
	NU2	-0.7%	0.24	-137.6	-140.1	-138.8	-135.6	
	NU3	6.1%	0.77	2.2	-41.7	-66.4	-80.4	
	NU4	3.6%	0.55	-77.9	-109.0	-124.9	-132.6	
	NU5	3.9%	0.58	-54.5	-81.3	-95.3	-102.3	
N'fifikh (downstream)	**ND1**	4.5%	0.65	-8.0	-13.9	-17.0	-18.6	
	ND2	2.9%	0.50	-44.4	-55.5	-60.8	-63.0	
Taskourt	**TA1**	7.2%	0.91	128.2	-59.1	-164.0	-223.6	
	TA2	6.2%	0.79	25.5	-174.7	-283.7	-343.0	
	TA3	7.3%	0.91	85.9	-36.2	-104.5	-143.3	
	TA4	5.9%	0.76	-9.8	-138.5	-207.8	-244.6	
Timkit	**TI1**	6.2%	0.80	8.9	-55.1	-89.9	-108.9	
	TI2	5.7%	0.74	-13.6	-70.8	-101.4	-117.6	
Azghar	**AZ1**	10.6%	1.38	175.1	73.7	13.8	-23.1	After adjustment of the negative benefit to downstream reservoirs.

Table XVIII2.3.1: Financial and Economic Project Cost of Small-scale Water Supply System

Unit: Million DH

Cost Item	F.C.		L.C.		Total financial cost	Total economic cost
	Financial cost	Economic cost	Financial cost	Economic cost		
N'fifikh (Upstream)						
1. Construction cost						
1.1 Small-scale water supply facilities	-	-	1.80	1.11	1.80	1.11
2. Resettlement cost	-	-	-	-	-	-
3. Engineering services cost	-	-	0.13	0.11	0.13	0.11
4. Administration cost	-	-	0.09	0.06	0.09	0.06
Total of (1.- 4.)	-	-	2.02	1.28	2.02	1.28
Taskourt						
1. Construction cost						
1.1 Small-scale water supply facilities	-	-	3.00	1.89	3.00	1.89
2. Resettlement cost	-	-	-	-	-	-
3. Engineering services cost	-	-	0.21	0.18	0.21	0.18
4. Administration cost	-	-	0.15	0.09	0.15	0.09
Total of (1.- 4.)	-	-	3.36	2.16	3.36	2.16

Table XVIII2.3.2 Annual Cost of Small-scale Water Supply System (Economic Price, million DH)

Cost Item	Year in Order					Total cost (million DH)
	1st	2nd	3rd	4th	5th	
N'fifikh (Upstream)						
1. Construction cost						
1.1 Small-scale water supply facilities	-	-	-	1.11	-	1.11
2. Resettlement cost	-	-	-	-	-	-
3. Engineering services cost	-	-	-	0.11	-	0.11
4. Administration cost	-	-	-	0.06	-	0.06
Total of (1.- 4.)	-	-	-	1.28	-	1.28
Taskourt						
1. Construction cost						
1.1 Small-scale water supply facilities	-	-	-	-	1.89	1.89
2. Resettlement cost	-	-	-	-	-	-
3. Engineering services cost	-	-	-	-	0.18	0.18
4. Administration cost	-	-	-	-	0.09	0.09
Total of (1.- 4.)	-	-	-	-	2.16	2.16

Table XVIII2.3.3: Cost-Benefit Analysis for Small-scale Water Supply (1/2)

N'Fifikh

Year in order	Year	Benefit			Cost							Net Cash Flow
		Water supply	Other	Total	Water S. facility	E/S	Adminis-tration	Sub-total	O/M	Replace-ment	Total	
1	2001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000
2	2002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000
3	2003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000
4	2004	0.000	0.000	0.000	1.110	0.110	0.060	1.280	0.000		1.280	-1.280
5	2005	0.144	0.000	0.144				0.000	0.056		0.056	0.089
6	2006	0.145	0.000	0.145				0.000	0.056		0.056	0.090
7	2007	0.146	0.000	0.146				0.000	0.056		0.056	0.091
8	2008	0.147	0.000	0.147				0.000	0.056		0.056	0.092
9	2009	0.148	0.000	0.148				0.000	0.056		0.056	0.093
10	2010	0.149	0.000	0.149				0.000	0.056		0.056	0.094
11	2011	0.150	0.000	0.150				0.000	0.056		0.056	0.095
12	2012	0.151	0.000	0.151				0.000	0.056		0.056	0.096
13	2013	0.152	0.000	0.152				0.000	0.056		0.056	0.097
14	2014	0.153	0.000	0.153				0.000	0.056		0.056	0.098
15	2015	0.155	0.000	0.155				0.000	0.056		0.056	0.099
16	2016	0.156	0.000	0.156				0.000	0.056		0.056	0.100
17	2017	0.157	0.000	0.157				0.000	0.056		0.056	0.101
18	2018	0.158	0.000	0.158				0.000	0.056		0.056	0.102
19	2019	0.159	0.000	0.159				0.000	0.056		0.056	0.103
20	2020	0.160	0.000	0.160				0.000	0.056		0.056	0.105
21	2021	0.160	0.000	0.160				0.000	0.056		0.056	0.105
22	2022	0.160	0.000	0.160				0.000	0.056		0.056	0.105
23	2023	0.160	0.000	0.160				0.000	0.056		0.056	0.105
24	2024	0.160	0.000	0.160				0.000	0.056		0.056	0.105
25	2025	0.160	0.000	0.160				0.000	0.056		0.056	0.105
26	2026	0.160	0.000	0.160				0.000	0.056		0.056	0.105
27	2027	0.160	0.000	0.160				0.000	0.056		0.056	0.105
28	2028	0.160	0.000	0.160				0.000	0.056		0.056	0.105
29	2029	0.160	0.000	0.160				0.000	0.056	1.110	1.166	-1.006
30	2030	0.160	0.000	0.160				0.000	0.056		0.056	0.105
31	2031	0.160	0.000	0.160				0.000	0.056		0.056	0.105
32	2032	0.160	0.000	0.160				0.000	0.056		0.056	0.105
33	2033	0.160	0.000	0.160				0.000	0.056		0.056	0.105
34	2034	0.160	0.000	0.160				0.000	0.056		0.056	0.105
35	2035	0.160	0.000	0.160				0.000	0.056		0.056	0.105
36	2036	0.160	0.000	0.160				0.000	0.056		0.056	0.105
37	2037	0.160	0.000	0.160				0.000	0.056		0.056	0.105
38	2038	0.160	0.000	0.160				0.000	0.056		0.056	0.105
39	2039	0.160	0.000	0.160				0.000	0.056		0.056	0.105
40	2040	0.160	0.000	0.160				0.000	0.056		0.056	0.105
41	2041	0.160	0.000	0.160				0.000	0.056		0.056	0.105
42	2042	0.160	0.000	0.160				0.000	0.056		0.056	0.105
43	2043	0.160	0.000	0.160				0.000	0.056		0.056	0.105
44	2044	0.160	0.000	0.160				0.000	0.056		0.056	0.105
45	2045	0.160	0.000	0.160				0.000	0.056		0.056	0.105
46	2046	0.160	0.000	0.160				0.000	0.056		0.056	0.105
47	2047	0.160	0.000	0.160				0.000	0.056		0.056	0.105
48	2048	0.160	0.000	0.160				0.000	0.056		0.056	0.105
49	2049	0.160	0.000	0.160				0.000	0.056		0.056	0.105
50	2050	0.160	0.000	0.160				0.000	0.056		0.056	0.105
51	2051	0.160	0.000	0.160				0.000	0.056		0.056	0.105
52	2052	0.160	0.000	0.160				0.000	0.056		0.056	0.105
53	2053	0.160	0.000	0.160				0.000	0.056		0.056	0.105
54	2054	0.160	0.000	0.160				0.000	0.056		0.056	0.105

EIRR 6.1%

Table XVIII2.3.3: Cost-Benefit Analysis for Small-scale Water Supply (2/2)

Taskourt

Year in order	Year	Benefit			Cost							Net Cash Flow
		Water supply	Other	Total	Water S. facility	E/S	Adminis-tration	Sub-total	O/M	Replace-ment	Total	
1	2001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000
2	2002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000
3	2003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000
4	2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000
5	2005	0.000	0.000	0.000	1.890	0.180	0.090	2.160	0.000		2.160	-2.160
6	2006	0.254	0.000	0.254				0.000	0.095		0.095	0.159
7	2007	0.256	0.000	0.256				0.000	0.095		0.095	0.161
8	2008	0.258	0.000	0.258				0.000	0.095		0.095	0.163
9	2009	0.259	0.000	0.259				0.000	0.095		0.095	0.165
10	2010	0.261	0.000	0.261				0.000	0.095		0.095	0.167
11	2011	0.263	0.000	0.263				0.000	0.095		0.095	0.168
12	2012	0.265	0.000	0.265				0.000	0.095		0.095	0.170
13	2013	0.267	0.000	0.267				0.000	0.095		0.095	0.172
14	2014	0.269	0.000	0.269				0.000	0.095		0.095	0.174
15	2015	0.270	0.000	0.270				0.000	0.095		0.095	0.176
16	2016	0.272	0.000	0.272				0.000	0.095		0.095	0.178
17	2017	0.274	0.000	0.274				0.000	0.095		0.095	0.180
18	2018	0.276	0.000	0.276				0.000	0.095		0.095	0.182
19	2019	0.278	0.000	0.278				0.000	0.095		0.095	0.184
20	2020	0.280	0.000	0.280				0.000	0.095		0.095	0.186
21	2021	0.280	0.000	0.280				0.000	0.095		0.095	0.186
22	2022	0.280	0.000	0.280				0.000	0.095		0.095	0.186
23	2023	0.280	0.000	0.280				0.000	0.095		0.095	0.186
24	2024	0.280	0.000	0.280				0.000	0.095		0.095	0.186
25	2025	0.280	0.000	0.280				0.000	0.095		0.095	0.186
26	2026	0.280	0.000	0.280				0.000	0.095		0.095	0.186
27	2027	0.280	0.000	0.280				0.000	0.095		0.095	0.186
28	2028	0.280	0.000	0.280				0.000	0.095		0.095	0.186
29	2029	0.280	0.000	0.280				0.000	0.095	1.890	1.985	-1.705
30	2030	0.280	0.000	0.280				0.000	0.095		0.095	0.186
31	2031	0.280	0.000	0.280				0.000	0.095		0.095	0.186
32	2032	0.280	0.000	0.280				0.000	0.095		0.095	0.186
33	2033	0.280	0.000	0.280				0.000	0.095		0.095	0.186
34	2034	0.280	0.000	0.280				0.000	0.095		0.095	0.186
35	2035	0.280	0.000	0.280				0.000	0.095		0.095	0.186
36	2036	0.280	0.000	0.280				0.000	0.095		0.095	0.186
37	2037	0.280	0.000	0.280				0.000	0.095		0.095	0.186
38	2038	0.280	0.000	0.280				0.000	0.095		0.095	0.186
39	2039	0.280	0.000	0.280				0.000	0.095		0.095	0.186
40	2040	0.280	0.000	0.280				0.000	0.095		0.095	0.186
41	2041	0.280	0.000	0.280				0.000	0.095		0.095	0.186
42	2042	0.280	0.000	0.280				0.000	0.095		0.095	0.186
43	2043	0.280	0.000	0.280				0.000	0.095		0.095	0.186
44	2044	0.280	0.000	0.280				0.000	0.095		0.095	0.186
45	2045	0.280	0.000	0.280				0.000	0.095		0.095	0.186
46	2046	0.280	0.000	0.280				0.000	0.095		0.095	0.186
47	2047	0.280	0.000	0.280				0.000	0.095		0.095	0.186
48	2048	0.280	0.000	0.280				0.000	0.095		0.095	0.186
49	2049	0.280	0.000	0.280				0.000	0.095		0.095	0.186
50	2050	0.280	0.000	0.280				0.000	0.095		0.095	0.186
51	2051	0.280	0.000	0.280				0.000	0.095		0.095	0.186
52	2052	0.280	0.000	0.280				0.000	0.095		0.095	0.186
53	2053	0.280	0.000	0.280				0.000	0.095		0.095	0.186
54	2054	0.280	0.000	0.280				0.000	0.095		0.095	0.186
55	2055	0.280	0.000	0.280				0.000	0.095		0.095	0.186

EIRR 6.5%

Table XVIII2.4.1: Estimation of Damageable Area

	Household Interview Survey					Damageable Area		
	Total Area (ha)	Inundation area		Eroded area		Project Area (ha)	Inundation Area (ha)	Eroded Area (ha)
		Area (ha)	% of total	Area (ha)	% of total			
	a	b	c=b/a	d	e=d/a	f	g=c x f	h=e x f
N'fifikh (Upstream)	365	17.1	4.7%	2.4	0.7%	1,000	47	7
Taskourt	600	14.7	2.4%	7.4	1.2%	4,500	110	55
Timkit	200	9.9	5.0%	1.3	0.6%	1,350	67	9
Azghar	220	6.5	3.0%	4.1	1.9%	2,000	59	37

Table XVIII2.4.2: Estimation of Flood Mitigation Benefit

Project	Damageable area (ha)	Damageable property		Damageable amount	Damage to irrigation facilities	Total inundation damage	Annual mean flood damage
		Net income	Production cost				
	a	b	c	d=a*((b*3)+(c/2))	e = d x 100 %	f=d+e	g
N'fifikh (Upstream)	47	2,267	1,844	361,817	361,817	723,635	108,545
Taskourt	110	2,594	1,572	943,337	943,337	1,886,674	283,001
Timkit	67	7,679	1,848	1,605,387	1,605,387	3,210,774	481,616
Azghar	59	165	1,406	70,791	70,791	141,582	21,237

Table XVIII2.4.3: Estimation of Erosion Mitigation Benefit

	Damageable area (ha)	Damageable property		Damageable amount	Annual mean flood damage
		Net income	Production cost		
	a	b	c	d=a*((b*5)+(c/2))	e
N'fifikh (Upstream)	7	2,267	1,844	80,594	12,089
Taskourt	55	2,594	1,572	761,395	114,209
Timkit	9	7,679	1,848	353,871	53,081
Azghar	37	165	1,406	56,953	8,543

Table XVIII2.4.4: Calculation of Ratio of Economically Induced Benefit (1/2)
(from Construction Sector to Other Industries)

No. Item	No. of IO table	Production increase against investment for construction sector (% for investment for construction sector)	Production in 1990 (million DH)	Value Added in 1990 (million DH)	Ratio of Value Added	Ratio of Induce Benefit (%)
a	b	c	d	e	f=e/d	g=c x f
24 Phosphates	24	0.4	6,808.80	4,494.90	0.66	0.3
25 NonMetMin	25	5.2	929.30	203.60	0.22	1.1
26 Met Min	26	-	927.90	657.00	0.71	0.0
27 Crude petrol	27	3.7	263.40	115.05	0.44	1.6
28 Refine petrol	28	7.1	15,290.10	6,867.55	0.45	3.2
29 Electricity	29	1.4	6,833.30	6,086.30	0.89	1.2
30 Ind Allm		0.2	15,574.40	1,595.30	0.10	0.0
	30		8,157.57	342.74		
	31		885.40	159.46		
	32		6,162.06	1,039.85		
	33		369.37	53.25		
31 Other Ind Allm		0.1	14,271.11	3,234.90	0.23	0.0
	34		3,185.17	1,054.91		
	35		59.92	5.20		
	36		2,187.44	476.80		
	37		3,953.61	516.24		
	38		1,978.83	628.90		
	39		1,866.94	438.91		
	40		1,039.20	113.94		
32 Bev. Tobac		0.8	7,739.49	5,324.90	0.69	0.6
	41		1,204.35	790.42		
	42		919.71	328.20		
	43		2.22	0.75		
	44		1,051.04	508.42		
	45		4,562.17	3,697.11		
33 Textile		0.7	14,206.31	2,904.99	0.20	0.1
	46		1,139.30	259.68		
	47		6,131.01	1,243.50		
	48		1,510.67	258.87		
	49		1,156.74	264.02		
	50		926.88	190.16		
	51		690.02	152.67		
	52		2,651.69	536.09		
34 Cloths		-	8,903.60	3,770.70	0.42	0.0
	53		853.63	361.52		
	54		7,474.26	3,165.37		
	55		575.71	243.81		
35 Leather shoes		0.7	13,615.79	7,401.40	0.54	0.4
	56		4,431.53	2,013.43		
	57		3,060.86	1,644.66		
	58		6,123.40	3,743.31		
36 Wood		5.4	4,205.79	1,687.70	0.40	2.2
	59		613.14	104.68		
	60		851.85	488.82		
	61		665.25	187.10		
	62		664.38	267.19		
	63		957.47	474.41		
	64		453.70	165.50		
37 Paper		1.2	6,283.60	1,312.30	0.21	0.3
	65		2,329.99	557.62		
	66		2,498.59	377.76		
	67		1,455.02	376.92		
38 Quarr Min		32.8	12,156.80	3,272.71	0.27	8.8
	68		1,451.39	306.01		
	69		791.48	137.90		
	70		685.95	166.39		
	71		5,527.46	1,758.21		
	72		1,636.57	500.96		
	73		900.44	154.87		
	74		1,163.51	248.37		
39 Met Ind		10.1	3,869.80	761.90	0.20	2.0
	75		2,910.51	670.59		
	76		959.29	91.31		

Table XVIII2.4.4: Calculation of Ratio of Economically Induced Benefit (2/2)
(from Construction Sector to Other Industries)

No. Item	No. of IO table	Production increase against investment for construction sector (% for investment for construction sector)	Production in 1990 (million DH)	Value Added in 1990 (million DH)	Ratio of Value Added	Ratio of Induce Benefit (%)
a	b	c	d	e	f=e/d	g=c x f
40 Met Obj		8.8	8,287.81	1,669.09	0.20	1.8
	77		288.36	105.90		
	78		338.70	126.77		
	79		2,778.32	594.15		
	80		1,503.24	292.50		
	81		2,282.80	223.59		
	82		342.70	137.54		
	83		531.96	127.44		
	84		221.73	61.20		
41 Equipm		0.5	1,903.91	533.81	0.28	0.1
	85		93.67	38.70		
	86		114.09	53.26		
	87		38.38	17.51		
	88		103.45	33.94		
	89		53.22	18.16		
	90		586.23	194.84		
	91		914.87	177.40		
42 Transp Mat		0.8	4,981.79	1,177.20	0.24	0.2
	92		2,208.42	438.12		
	93		2,174.73	574.14		
	94		352.51	57.79		
	95		90.81	49.40		
	96		137.18	50.51		
	97		0.00	0.00		
	98		18.14	7.24		
43 Elect Mat		3.0	4,867.30	1,109.59	0.23	0.7
	99		34.43	17.39		
	100		531.60	138.61		
	101		29.17	7.70		
	102		1,338.48	200.02		
	103		541.76	179.58		
	104		96.63	23.78		
	105		1,391.29	307.55		
	106		318.80	70.27		
	107		585.14	164.69		
44 Precinst		0.2	111.99	58.30	0.52	0.1
	108		28.77	18.46		
	109		68.35	33.66		
	110		8.29	4.11		
	111		6.58	2.07		
45 Chemicals		4.3	17,758.90	3,441.91	0.19	0.8
	112		8,359.45	1,150.83		
	113		2,809.57	504.17		
	114		834.72	281.13		
	115		1,254.64	315.59		
	116		1,967.09	538.54		
	117		1,616.65	401.37		
	118		916.78	250.28		
46 Rubber		0.7	3,008.50	861.50	0.29	0.2
	119		1,031.78	437.17		
	120		186.65	56.39		
	121		1,790.07	367.94		
47 Other Ind		0.1	675.31	155.61	0.23	0.0
	122		115.30	29.28		
	123		0.00	0.00		
	124		35.91	11.56		
	125		524.10	114.77		
48 Construct	126	3.3	29,315.10	10,276.35	0.35	1.2
49 Commerce	127	-	37,803.09	23,162.01	0.61	0.0
50 Banking	128	3.5	14,646.80	10,274.80	0.70	2.5
51 Insurance	129	0.9	3,945.80	3,549.55	0.90	0.8
52 Banking	130	5.3	12,836.00	6,492.25	0.51	2.7
53 Insurance	131	-	1,811.90	33.50	0.02	0.0
54 Oth Service	132	11.0	66,555.90	22,384.50	0.34	3.7
55 Pub. Adm.	133	-	34,513.80	24,716.68	0.72	0.0
Total		112.2				**36.6**

Table XVIII2.4.5: Calculation of Ratio of Economically Induced Benefit (from Agricultural Sector to Other Industries)

No.	Item	Effect from Agricultural Production to Other Industries (%)												Ratio of Value Added	Ratio of Economically Induced Benefit (%)											
		Hard wheat	Soft wheat	Barley	Legume	Vegetable	Alfalfa	Olive	Grape	Dates	Almond	Other fruit	Other agri.		Hard wheat	Soft wheat	Barley	Legume	Vegetable	Alfalfa	Olive	Grape	Dates	Almond	Other fruit	Other agri.	Average
24	Phosphates	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	-	0.66	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	-	
25	NonMetMin	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.3	-	0.22	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	-	
26	Met Min	-	-	-	-	-	-	-	-	-	-	-	-	0.71	-	-	-	-	-	-	-	-	-	-	-	-	
27	Crude petrol	1.9	1.2	1.9	2.2	1.9	4.5	2.2	2.1	2.1	1.6	1.5	0.3	0.44	0.8	0.5	0.8	1.0	0.8	2.0	1.0	0.9	0.9	0.7	0.7	0.1	
28	Refine petrol	2.7	1.7	2.7	2.5	2.2	3.3	2.8	2.7	2.7	3.0	2.9	0.1	0.45	1.2	0.8	1.2	1.1	1.0	1.5	1.3	1.2	1.2	1.4	1.3	0.0	
29	Electricity	0.7	0.4	0.7	0.8	0.7	1.7	0.8	0.8	0.8	0.4	0.6	0.1	0.89	0.6	0.4	0.6	0.7	0.6	1.5	0.7	0.7	0.7	0.4	0.5	0.1	
30	Ind Allm	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-	0.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
31	Other Ind Allm	0.1	0.1	0.1	0.1	0.1	0.7	0.1	0.1	0.1	0.1	0.1	-	0.23	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	-	
32	Bev. Tobac	0.6	0.4	0.6	0.6	0.5	0.7	0.6	0.6	0.6	0.7	0.7	-	0.69	0.4	0.3	0.4	0.4	0.3	0.5	0.4	0.4	0.4	0.5	0.5	-	
33	Textile	0.4	0.2	0.4	1.2	1.1	0.8	1.0	1.0	1.0	1.1	1.8	-	0.20	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	-	
34	Cloths	-	-	-	0.1	-	-	-	-	-	-	-	-	0.42	-	-	-	0.0	-	-	-	-	-	-	-	-	
35	Leather shoes	0.5	0.3	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-	0.54	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	
36	Wood	0.3	0.2	0.3	0.6	0.5	0.4	1.3	1.3	1.3	0.6	0.5	-	0.40	0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.5	0.5	0.2	0.2	-	
37	Paper	1.0	0.7	1.0	2.7	2.4	0.7	3.1	3.0	3.0	2.6	2.3	0.1	0.21	0.2	0.1	0.2	0.6	0.5	0.1	0.7	0.6	0.6	0.5	0.5	0.0	
38	Quarr Min	0.5	0.3	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.9	-	0.27	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	-	
39	Met Ind	0.4	0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	-	0.20	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	
40	Met Obj	0.8	0.5	0.8	0.7	0.6	0.4	0.6	0.6	0.6	0.7	1.3	-	0.20	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	-	
41	Equipm	1.0	0.6	1.0	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	-	0.28	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-	
42	Transp Mat	0.4	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.5	-	0.24	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	
43	Elect Mat	0.3	0.2	0.3	0.3	0.3	0.5	0.3	0.2	0.2	0.3	0.3	-	0.23	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	-	
44	Precinst	-	-	-	-	-	-	-	-	-	-	-	-	0.52	-	-	-	-	-	-	-	-	-	-	-	-	
45	Chemicals	4.6	3.0	4.6	3.9	3.5	3.2	3.6	3.6	3.6	3.8	2.8	0.2	0.19	0.9	0.6	0.9	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.5	0.0	
46	Rubber	0.3	0.2	0.3	0.7	0.6	1.5	0.6	0.6	0.6	0.7	0.8	0.1	0.29	0.1	0.1	0.1	0.2	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.0	
47	Other Ind	0.1	-	0.1	-	-	-	-	-	-	-	-	-	0.23	0.0	-	0.0	-	-	-	-	-	-	-	-	-	
48	Construct	0.7	0.5	0.7	0.6	0.5	0.7	0.5	0.5	0.5	0.7	2.0	-	0.35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	-	
49	Commerce	-	-	-	-	-	-	-	-	-	-	-	-	0.61	-	-	-	-	-	-	-	-	-	-	-	-	
50	Banking	1.6	1.0	1.6	1.8	1.6	1.1	1.5	1.5	1.5	1.5	2.3	0.1	0.70	1.1	0.7	1.1	1.3	1.1	0.8	1.1	1.1	1.1	1.1	1.6	0.1	
51	Insurance	0.6	0.4	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	-	0.90	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	-	
52	Banking	4.5	2.9	4.5	3.4	3.0	1.8	3.1	3.0	3.0	3.2	2.9	0.1	0.51	2.3	1.5	2.3	1.7	1.5	0.9	1.6	1.5	1.5	1.6	1.5	0.1	
53	Insurance	0.8	0.5	0.8	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.5	-	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
54	Oth Service	8.7	5.6	8.8	9.0	8.0	10.8	9.0	8.8	8.8	10.8	10.4	0.3	0.34	3.0	1.9	3.0	3.1	2.7	3.7	3.1	3.0	3.0	3.7	3.5	0.1	
55	Pub. Adm.	-	-	-	-	-	-	-	-	-	-	-	-	0.72	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	34.4	22.0	34.5	35.2	31.1	36.7	34.6	33.9	33.9	35.9	37.7	1.4		13.1	8.4	13.2	13.2	11.6	14.3	12.9	12.7	12.7	13.1	13.9	0.6	**11.6**

Table XVIII2.4.6: Financial and Economic Project Cost (1/2)

Cost Item	F.C. (million DH)		L.C. (million DH)		Total financial	Total economic
	Financial cost	Economic cost	Financial cost	Economic cost	cost (million DH)	cost (million DH)
N'fifikh (Upstream)						
1. Construction cost						
1.1 Dam and appurtenant facilities	93.0	93.0	50.1	43.1	143.1	136.1
1.2 Irrigation facilities	18.3	18.3	18.2	15.7	36.5	34.0
1.3 Water supply system	0.0	0.0	1.4	1.2	1.4	1.2
2. Resettlement cost	0.0	0.0	3.3	2.8	3.3	2.8
3. Engineering services cost	8.2	8.2	4.5	4.5	12.7	12.7
4. Administration cost	0.0	0.0	9.2	8.7	9.2	8.7
5. Physical contingency	12.0	12.0	8.7	7.6	20.7	19.6
Sub-total of (1.- 5.)	131.5	131.5	95.4	83.6	226.9	215.1
6. Price Contingency	25.7	0.0	18.6	0.0	44.3	0.0
Sub-total of (1.- 6.)	157.2	131.5	114.0	83.6	271.2	215.1
7. Value Added Tax	0.0	0.0	38.9	0.0	38.9	0.0
Total of (1.- 7.)	157.2	131.5	152.9	83.6	310.1	215.1
Taskourt						
1. Construction cost						
1.1 Dam and appurtenant facilities	179.0	179.0	96.4	82.9	275.4	261.9
1.2 Irrigation facilities	65.9	65.9	65.8	56.6	131.7	122.5
1.3 Water supply system	0.0	0.0	2.4	2.1	2.4	2.1
2. Resettlement cost	0.0	0.0	28.5	24.6	28.5	24.6
3. Engineering services cost	18.6	18.6	10.1	10.1	28.7	28.7
4. Administration cost	0.0	0.0	21.9	20.6	21.9	20.6
5. Physical contingency	26.4	26.4	22.5	19.7	48.9	46.1
Sub-total of (1.- 5.)	289.9	289.9	247.6	216.6	537.5	506.5
6. Price Contingency	55.8	0.0	45.2	0.0	101.0	0.0
Sub-total of (1.- 6.)	345.7	289.9	292.8	216.6	638.5	506.5
7. Value Added Tax	0.0	0.0	91.6	0.0	91.6	0.0
Total of (1.- 7.)	345.7	289.9	384.4	216.6	730.1	506.5
Timkit						
1. Construction cost						
1.1 Dam and appurtenant facilities	105.5	105.5	56.8	48.8	162.3	154.3
1.2 Irrigation facilities	56.2	56.2	56.1	48.2	112.3	104.4
2. Resettlement cost	0.0	0.0	6.4	5.5	6.4	5.5
3. Engineering services cost	12.5	12.5	6.7	6.7	19.2	19.2
4. Administration cost	0.0	0.0	14.0	13.2	14.0	13.2
5. Physical contingency	17.4	17.4	14.0	12.2	31.4	29.6
Sub-total of (1.- 5.)	191.6	191.6	154.0	134.6	345.6	326.2
6. Price Contingency	43.2	0.0	34.3	0.0	77.5	0.0
Sub-total of (1.- 6.)	234.8	191.6	188.3	134.6	423.1	326.2
7. Value Added Tax	0.0	0.0	60.8	0.0	60.8	0.0
Total of (1.- 7.)	234.8	191.6	249.1	134.6	483.9	326.2
Azghar						
1. Construction cost						
1.1 Dam and appurtenant facilities	73.1	73.1	39.4	33.9	112.5	107.0
1.2 Irrigation facilities	36.7	36.7	36.6	31.5	73.3	68.2
2. Resettlement cost	0.0	0.0	5.1	4.4	5.1	4.4
3. Engineering services cost	8.5	8.5	4.5	4.5	13.0	13.0
4. Administration cost	0.0	0.0	9.5	9.0	9.5	9.0
5. Physical contingency	11.8	11.8	9.5	8.3	21.3	20.1
Sub-total of (1.- 5.)	130.1	130.1	104.6	91.6	234.7	221.7
6. Price Contingency	25.9	0.0	20.4	0.0	46.3	0.0
Sub-total of (1.- 6.)	156.0	130.1	125.0	91.6	281.0	221.7
7. Value Added Tax	0.0	0.0	40.4	0.0	40.4	0.0
Total of (1.- 7.)	156.0	130.1	165.4	91.6	321.4	221.7

Table XVIII2.4.6: Financial and Economic Project Cost (2/2)

Cost Item	F.C. (million DH)		L.C. (million DH)		Total financial cost (million DH)	Total economic cost (million DH)
	Financial cost	Economic cost	Financial cost	Economic cost		
TOTAL						
1. Construction cost						
1.1 Dam and appurtenant facilities	450.6	450.6	242.7	208.7	693.3	659.3
1.2 Irrigation facilities	177.1	177.1	176.7	152.0	353.8	329.1
1.3 Water supply system	0.0	0.0	3.8	3.3	3.8	3.3
2. Resettlement cost	0.0	0.0	43.3	37.3	43.3	37.3
3. Engineering services cost	47.8	47.8	25.8	25.8	73.6	73.6
4. Administration cost	0.0	0.0	54.6	51.5	54.6	51.5
5. Physical contingency	67.6	67.6	54.7	47.8	122.3	115.4
Sub-total of (1.- 5.)	743.1	743.1	601.6	526.4	1,344.7	1,269.5
6. Price Contingency	150.6	0.0	118.5	0.0	269.1	0.0
Sub-total of (1.- 6.)	893.7	743.1	720.1	526.4	1,613.8	1,269.5
7. Value Added Tax	0.0	0.0	231.7	0.0	231.7	0.0
Total of (1.- 7.)	893.7	743.1	951.8	526.4	1,845.5	1,269.5

Note: 1. Price level: as of April 2000, US$1.0 = 10.68 DH, J. Yen100 = 9.90 DH

2. F.C. means foreign currency portion and L.C. means local currency portion

3. Engineering service fee is estimated as 7 % of total construction cost

4. Administration cost is estimated as 5 % of construction cost and resettlement cost.

5. Physical contingency: 10% of all items

6. Price contingency: 3% per annum for all items

7. Value added tax: 20% for engineering services and 14% for all other items

Table XVIII2.4.7: Breakdown of Annual Cost (Economic Price, million DH)

Cost Item	Year in Order								Total cost
	1st	2nd	3rd	4th	5th	6th	7th	8th	(million DH)
N'fifikh (Upstream)									
1. Construction cost									
1.1 Dam and appurtenant facilities	-	32.7	69.4	34.0	-	-	-	-	136.1
1.2 Irrigation facilities	-	6.8	17.0	10.2	-	-	-	-	34.0
1.3 Water supply system	-	-	-	1.2	-	-	-	-	1.2
2. Resettlement cost	1.4	1.4	-	-	-	-	-	-	2.8
3. Engineering services cost	-	2.9	6.4	3.4	-	-	-	-	12.7
4. Administration cost	0.1	2.0	4.3	2.3	-	-	-	-	8.7
5. Physical contingency	0.2	4.6	9.7	5.1	-	-	-	-	19.6
Total of (1.- 5.)	1.7	50.4	106.8	56.2	-	-	-	-	215.1
Taskourt									
1. Construction cost									
1.1 Dam and appurtenant facilities	-	28.8	60.2	86.4	86.5	-	-	-	261.9
1.2 Irrigation facilities	-	-	24.5	61.3	36.7	-	-	-	122.5
1.3 Water supply system	-	-	-	-	2.1	-	-	-	2.1
2. Resettlement cost	12.3	12.3	-	-	-	-	-	-	24.6
3. Engineering services cost	-	2.1	6.3	11.0	9.3	-	-	-	28.7
4. Administration cost	0.6	2.1	4.2	7.4	6.3	-	-	-	20.6
5. Physical contingency	1.3	4.5	9.5	16.6	14.2	-	-	-	46.1
Total of (1.- 5.)	14.2	49.8	104.7	182.7	155.1	-	-	-	506.5
Timkit									
1. Construction cost									
1.1 Dam and appurtenant facilities	-	26.2	33.9	50.9	43.3	-	-	-	154.3
1.2 Irrigation facilities	-	-	20.9	52.2	31.3	-	-	-	104.4
2. Resettlement cost	2.8	2.7	-	-	-	-	-	-	5.5
3. Engineering services cost	-	2.0	4.0	7.7	5.5	-	-	-	19.2
4. Administration cost	0.1	1.4	2.7	5.2	3.8	-	-	-	13.2
5. Physical contingency	0.3	3.2	6.2	11.6	8.3	-	-	-	29.6
Total of (1.- 5.)	3.2	35.5	67.7	127.6	92.2	-	-	-	326.2
Azghar									
1. Construction cost									
1.1 Dam and appurtenant facilities	-	25.7	40.7	40.6	-	-	-	-	107.0
1.2 Irrigation facilities	-	13.6	34.1	20.5	-	-	-	-	68.2
2. Resettlement cost	2.2	2.2	-	-	-	-	-	-	4.4
3. Engineering services cost	-	2.9	5.5	4.6	-	-	-	-	13.0
4. Administration cost	0.1	2.1	3.7	3.1	-	-	-	-	9.0
5. Physical contingency	0.2	4.7	8.4	6.8	-	-	-	-	20.1
Total of (1.- 5.)	2.5	51.2	92.4	75.6	-	-	-	-	221.7
Overall Plan									
1. Construction cost									
1.1 Dam and appurtenant facilities	-	-	-	28.8	144.8	230.4	212.0	43.3	659.3
1.2 Irrigation facilities	-	-	-	-	44.9	133.3	119.6	31.3	329.1
1.3 Water supply system	-	-	-	-	-	-	3.3	-	3.3
2. Resettlement cost	-	-	12.3	18.7	6.3	-	-	-	37.3
3. Engineering services cost	-	-	-	2.1	14.1	26.9	25.0	5.5	73.6
4. Administration cost	-	-	0.6	2.4	9.7	18.1	16.9	3.8	51.5
5. Physical contingency	-	-	1.3	5.2	22.0	40.9	37.7	8.3	115.4
Total of (1.- 5.)	-	-	14.2	57.2	241.8	449.6	414.5	92.2	1,269.5

Table XVIII2.4.8: Cost-Benefit Analysis of the Priority Projects (1/10)

N'fifikh - Upstream

Unit: million DH

Year in order	Year	Benefit					Cost										Net Cash Flow
							Investment								O/M	Replace-ment	Total Cost	
		Agri-culture	Flood & erosion control	water supply	Other direct benefit	Total Benefit	Dam	Irrigation	Water supply	Resettle-ment	Engr. services	Adminis-tration	Physical contingency	Sub-total				
1	2001	0.0	0.00	0.00	0.00	0.0	0.0	0.0		1.4		0.1	0.2	1.7	0.0		1.7	-1.7
2	2002	0.0	0.00	0.00	0.00	0.0	32.7	6.8		1.4	2.9	2.0	4.6	50.4	0.0		50.4	-50.4
3	2003	0.0	0.00	0.00	0.00	0.0	69.4	17.0			6.4	4.3	9.7	106.8	0.0		106.8	-106.8
4	2004	0.0	0.00	0.00	0.00	0.0	34.0	10.2	1.2		3.4	2.3	5.1	56.2	0.0		56.2	-56.2
5	2005	8.5	0.12	0.14	0.88	9.6								0.0	1.6		1.6	8.1
6	2006	11.5	0.12	0.15	1.18	12.9								0.0	1.6		1.6	11.4
7	2007	14.3	0.12	0.15	1.46	16.1								0.0	1.6		1.6	14.5
8	2008	14.3	0.12	0.15	1.46	16.1								0.0	1.6		1.6	14.5
9	2009	15.4	0.12	0.15	1.57	17.2								0.0	1.6		1.6	15.7
10	2010	15.6	0.12	0.15	1.58	17.4								0.0	1.6		1.6	15.9
11	2011	16.6	0.12	0.15	1.69	18.6								0.0	1.6		1.6	17.0
12	2012	17.7	0.12	0.15	1.80	19.8								0.0	1.6		1.6	18.2
13	2013	17.7	0.12	0.15	1.80	19.8								0.0	1.6		1.6	18.2
14	2014	17.7	0.12	0.15	1.80	19.8								0.0	1.6		1.6	18.2
15	2015	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
16	2016	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
17	2017	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
18	2018	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
19	2019	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
20	2020	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
21	2021	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
22	2022	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
23	2023	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
24	2024	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
25	2025	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
26	2026	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
27	2027	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
28	2028	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
29	2029	17.7	0.12	0.16	1.80	19.8								0.0	1.6	12.3	13.9	5.9
30	2030	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
31	2031	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
32	2032	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
33	2033	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
34	2034	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
35	2035	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
36	2036	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
37	2037	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
38	2038	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
39	2039	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
40	2040	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
41	2041	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
42	2042	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
43	2043	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
44	2044	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
45	2045	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
46	2046	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
47	2047	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
48	2048	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
49	2049	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
50	2050	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
51	2051	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
52	2052	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
53	2053	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2
54	2054	17.7	0.12	0.16	1.80	19.8								0.0	1.6		1.6	18.2

EIRR= 6.8%
B/C = 0.86 (at discount rate: 8%)
NPV= -26.6 (at discount rate: 8%)
NPV= 24.0 (at discount rate: 6%)
NPV= -55.4 (at discount rate: 10%)
NPV= -72.1 (at discount rate: 12%)

Table XVIII2.4.8: Cost-Benefit Analysis of the Priority Projects (2/10)

N'fifikh - Upstream (including Indirect Benefit)

Unit: million DH

Year in order	Year	Benefit						Cost										Net Cash Flow
								Investment								O/M	Replace-ment	Total Cost	
		Agri-culture	Flood & erosion control	water supply	Other direct benefit	Indirect Benefit	Total Benefit	Dam	Irrigation	Water supply	Resettle-ment	Engr. services	Adminis-tration	Physical contingency	Sub-total				
1	2001	0.0				0.0	0.0	0.0	0.0		1.4		0.1	0.2	1.7	0.0		1.7	-1.7
2	2002	0.0				16.1	16.1	32.7	6.8		1.4	2.9	2.0	4.6	50.4	0.0		50.4	-34.3
3	2003	0.0				35.2	35.2	69.4	17.0			6.4	4.3	9.7	106.8	0.0		106.8	-71.6
4	2004	0.0				18.5	18.5	34.0	10.2	1.2		3.4	2.3	5.1	56.2	0.0		56.2	-37.7
5	2005	8.5	0.12	0.14	0.88	0.4	10.0								0.0	1.6		1.6	8.5
6	2006	11.5	0.12	0.15	1.18	0.4	13.3								0.0	1.6		1.6	11.8
7	2007	14.3	0.12	0.15	1.46	0.4	16.5								0.0	1.6		1.6	14.9
8	2008	14.3	0.12	0.15	1.46	0.4	16.5								0.0	1.6		1.6	14.9
9	2009	15.4	0.12	0.15	1.57	0.4	17.6								0.0	1.6		1.6	16.1
10	2010	15.6	0.12	0.15	1.58	0.4	17.8								0.0	1.6		1.6	16.3
11	2011	16.6	0.12	0.15	1.69	0.4	19.0								0.0	1.6		1.6	17.4
12	2012	17.7	0.12	0.15	1.80	0.4	20.2								0.0	1.6		1.6	18.6
13	2013	17.7	0.12	0.15	1.80	0.4	20.2								0.0	1.6		1.6	18.6
14	2014	17.7	0.12	0.15	1.80	0.4	20.2								0.0	1.6		1.6	18.6
15	2015	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
16	2016	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
17	2017	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
18	2018	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
19	2019	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
20	2020	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
21	2021	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
22	2022	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
23	2023	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
24	2024	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
25	2025	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
26	2026	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
27	2027	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
28	2028	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
29	2029	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6	12.3	13.9	6.3
30	2030	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
31	2031	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
32	2032	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
33	2033	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
34	2034	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
35	2035	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
36	2036	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
37	2037	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
38	2038	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
39	2039	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
40	2040	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
41	2041	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
42	2042	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
43	2043	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
44	2044	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
45	2045	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
46	2046	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
47	2047	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
48	2048	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
49	2049	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
50	2050	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
51	2051	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
52	2052	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
53	2053	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6
54	2054	17.7	0.12	0.16	1.80	0.4	20.2								0.0	1.6		1.6	18.6

EIRR= 10.0%
B/C = 1.17 (at discount rate: 8%)
NPV= 32.3 (at discount rate: 8%)
NPV= 87.4 (at discount rate: 6%)
NPV= -0.3 (at discount rate: 10%)
NPV= -20.4 (at discount rate: 12%)

Table XVIII2.4.8: Cost-Benefit Analysis of the Priority Projects (3/10)

Taskourt Unit: million DH

Year in order	Year	Benefit					Cost										Net Cash Flow
							Investment								O/M	Replace-ment	Total Cost	
		Agri-culture	Flood & erosion control	water supply	Other direct benefit	Total Benefit	Dam	Irrigation	Water supply	Resettle-ment	Engr. services	Adminis-tration	Physical contingency	Sub-total				
1	2001	0.0			0.0	0.0	0.0	0.0		12.3		0.6	1.3	14.2	0.0		14.2	-14.2
2	2002	0.0			0.0	0.0	28.8	0.0		12.3	2.1	2.1	4.5	49.8	0.0		49.8	-49.8
3	2003	0.0			0.0	0.0	60.2	24.5			6.3	4.2	9.5	104.7	0.0		104.7	-104.7
4	2004	0.0			0.0	0.0	86.4	61.3			11.0	7.4	16.6	182.7	0.0		182.7	-182.7
5	2005	0.0			0.0	0.0	86.5	36.7	2.1		9.3	6.3	14.2	155.1	0.0		155.1	-155.1
6	2006	25.8	0.397	0.254	2.6	29.1								0.0	4.2		4.2	24.9
7	2007	34.6	0.397	0.256	3.5	38.8								0.0	4.2		4.2	34.6
8	2008	40.7	0.397	0.258	4.1	45.4								0.0	4.2		4.2	41.2
9	2009	45.7	0.397	0.259	4.6	51.0								0.0	4.2		4.2	46.8
10	2010	49.1	0.397	0.261	5.0	54.7								0.0	4.2		4.2	50.5
11	2011	49.1	0.397	0.263	5.0	54.7								0.0	4.2		4.2	50.5
12	2012	49.1	0.397	0.265	5.0	54.7								0.0	4.2		4.2	50.5
13	2013	49.1	0.397	0.267	5.0	54.7								0.0	4.2		4.2	50.5
14	2014	49.1	0.397	0.269	5.0	54.7								0.0	4.2		4.2	50.5
15	2015	49.1	0.397	0.270	5.0	54.7								0.0	4.2		4.2	50.5
16	2016	49.1	0.397	0.272	5.0	54.7								0.0	4.2		4.2	50.5
17	2017	49.1	0.397	0.274	5.0	54.7								0.0	4.2		4.2	50.5
18	2018	49.1	0.397	0.276	5.0	54.8								0.0	4.2		4.2	50.5
19	2019	49.1	0.397	0.278	5.0	54.8								0.0	4.2		4.2	50.5
20	2020	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
21	2021	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
22	2022	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
23	2023	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
24	2024	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
25	2025	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
26	2026	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
27	2027	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
28	2028	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
29	2029	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
30	2030	49.1	0.397	0.280	5.0	54.8								0.0	4.2	29.8	34.0	20.8
31	2031	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
32	2032	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
33	2033	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
34	2034	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
35	2035	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
36	2036	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
37	2037	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
38	2038	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
39	2039	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
40	2040	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
41	2041	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
42	2042	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
43	2043	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
44	2044	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
45	2045	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
46	2046	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
47	2047	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
48	2048	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
49	2049	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
50	2050	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
51	2051	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
52	2052	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
53	2053	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
54	2054	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5
55	2055	49.1	0.397	0.280	5.0	54.8								0.0	4.2		4.2	50.5

EIRR=	8.1%		
B/C =	1.02	(at discount rate:	8%)
NPV=	6.5	(at discount rate:	8%)
NPV=	146.9	(at discount rate:	6%)
NPV=	-73.1	(at discount rate:	10%)
NPV=	-119.3	(at discount rate:	12%)

Table XVIII2.4.8: Cost-Benefit Analysis of the Priority Projects (4/10)

Taskourt (including Indirect Benefit) Unit: million DH

Year in order	Year	Benefit						Cost										Net Cash Flow
								Investment										
		Agri-culture	Flood & erosion control	water supply	Other direct benefit	Indirect Benefit	Total Benefit	Dam	Irrigation	Water supply	Resettle-ment	Engr. services	Adminis-tration	Physical contingency	Sub-total	O/M	Replace-ment	Total Cost	
1	2001	0.0			0.0	0.0	0.0	0.0	0.0		12.3		0.6	1.3	14.2	0.0		14.2	-14.2
2	2002	0.0			0.0	11.7	11.7	28.8	0.0		12.3	2.1	2.1	4.5	49.8	0.0		49.8	-38.1
3	2003	0.0			0.0	34.5	34.5	60.2	24.5			6.3	4.2	9.5	104.7	0.0		104.7	-70.2
4	2004	0.0			0.0	60.1	60.1	86.4	61.3			11.0	7.4	16.6	182.7	0.0		182.7	-122.6
5	2005	0.0			0.0	51.0	51.0	86.5	36.7	2.1		9.3	6.3	14.2	155.1	0.0		155.1	-104.1
6	2006	25.8	0.397	0.254	2.6	0.9	30.0								0.0	4.2		4.2	25.8
7	2007	34.6	0.397	0.256	3.5	0.9	39.7								0.0	4.2		4.2	35.5
8	2008	40.7	0.397	0.258	4.1	0.9	46.3								0.0	4.2		4.2	42.1
9	2009	45.7	0.397	0.259	4.6	0.9	51.9								0.0	4.2		4.2	47.7
10	2010	49.1	0.397	0.261	5.0	0.9	55.6								0.0	4.2		4.2	51.4
11	2011	49.1	0.397	0.263	5.0	0.9	55.6								0.0	4.2		4.2	51.4
12	2012	49.1	0.397	0.265	5.0	0.9	55.6								0.0	4.2		4.2	51.4
13	2013	49.1	0.397	0.267	5.0	0.9	55.6								0.0	4.2		4.2	51.4
14	2014	49.1	0.397	0.269	5.0	0.9	55.6								0.0	4.2		4.2	51.4
15	2015	49.1	0.397	0.270	5.0	0.9	55.6								0.0	4.2		4.2	51.4
16	2016	49.1	0.397	0.272	5.0	0.9	55.6								0.0	4.2		4.2	51.4
17	2017	49.1	0.397	0.274	5.0	0.9	55.6								0.0	4.2		4.2	51.4
18	2018	49.1	0.397	0.276	5.0	0.9	55.7								0.0	4.2		4.2	51.4
19	2019	49.1	0.397	0.278	5.0	0.9	55.7								0.0	4.2		4.2	51.4
20	2020	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
21	2021	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
22	2022	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
23	2023	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
24	2024	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
25	2025	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
26	2026	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
27	2027	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
28	2028	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
29	2029	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
30	2030	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2	29.8	34.0	21.7
31	2031	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
32	2032	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
33	2033	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
34	2034	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
35	2035	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
36	2036	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
37	2037	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
38	2038	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
39	2039	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
40	2040	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
41	2041	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
42	2042	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
43	2043	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
44	2044	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
45	2045	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
46	2046	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
47	2047	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
48	2048	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
49	2049	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
50	2050	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
51	2051	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
52	2052	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
53	2053	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
54	2054	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4
55	2055	49.1	0.397	0.280	5.0	0.9	55.7								0.0	4.2		4.2	51.4

EIRR=	11.4%		
B/C =	1.31	(at discount rate:	8%)
NPV=	130.3	(at discount rate:	8%)
NPV=	282.6	(at discount rate:	6%)
NPV=	40.8	(at discount rate:	10%)
NPV=	-14.0	(at discount rate:	12%)

Table XVIII2.4.8: Cost-Benefit Analysis of the Priority Projects (5/10)

Timkit

Unit: million DH

Year in order	Year	Benefit				Cost										Net Cash Flow
						Investment							O/M	Replace-ment	Total Cost	
		Agri-culture	Flood & erosion control	Other direct benefit	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Adminis-tration	Physical contingency	Sub-total				
1	2001	0.0		0.0	0.0	0.0	0.0	2.8		0.1	0.3	3.2	0.0		3.2	-3.2
2	2002	0.0		0.0	0.0	26.2	0.0	2.7	2.0	1.4	3.2	35.5	0.0		35.5	-35.5
3	2003	0.0		0.0	0.0	33.9	20.9		4.0	2.7	6.2	67.7	0.0		67.7	-67.7
4	2004	0.0		0.0	0.0	50.9	52.2		7.7	5.2	11.6	127.6	0.0		127.6	-127.6
5	2005	0.0		0.0	0.0	43.3	31.3		5.5	3.8	8.3	92.2	0.0		92.2	-92.2
6	2006	15.6	0.5	1.6	17.8							0.0	3.5		3.5	14.3
7	2007	21.7	0.5	2.2	24.4							0.0	3.5		3.5	20.9
8	2008	25.2	0.5	2.6	28.3							0.0	3.5		3.5	24.8
9	2009	27.1	0.5	2.8	30.4							0.0	3.5		3.5	26.9
10	2010	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
11	2011	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
12	2012	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
13	2013	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
14	2014	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
15	2015	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
16	2016	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
17	2017	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
18	2018	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
19	2019	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
20	2020	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
21	2021	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
22	2022	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
23	2023	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
24	2024	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
25	2025	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
26	2026	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
27	2027	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
28	2028	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
29	2029	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
30	2030	28.1	0.5	2.9	31.5							0.0	3.5	20.0	23.5	8.0
31	2031	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
32	2032	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
33	2033	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
34	2034	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
35	2035	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
36	2036	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
37	2037	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
38	2038	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
39	2039	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
40	2040	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
41	2041	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
42	2042	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
43	2043	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
44	2044	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
45	2045	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
46	2046	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
47	2047	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
48	2048	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
49	2049	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
50	2050	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
51	2051	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
52	2052	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
53	2053	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
54	2054	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0
55	2055	28.1	0.5	2.9	31.5							0.0	3.5		3.5	28.0

EIRR=	7.1%			
B/C =	0.90	(at discount rate:	8%)	
NPV=	-27.6	(at discount rate:	8%)	
NPV=	47.9	(at discount rate:	6%)	
NPV=	-69.6	(at discount rate:	10%)	
NPV=	-93.3	(at discount rate:	12%)	

Table XVIII2.4.8: Cost-Benefit Analysis of the Priority Projects (6/10)

Timkit (including Indirect Benefit)

Unit: million DH

Year in order	Year	Benefit					Cost										Net Cash Flow
							Investment							O/M	Replace-ment	Total Cost	
		Agri-culture	Flood & erosion control	Other direct benefit	Indirect Benefit	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Adminis-tration	Physical contingency	Sub-total				
1	2001	0.0		0.0	0.0	0.0	0.0	0.0	2.8		0.1	0.3	3.2	0.0		3.2	-3.2
2	2002	0.0		0.0	10.7	10.7	26.2	0.0	2.7	2.0	1.4	3.2	35.5	0.0		35.5	-24.8
3	2003	0.0		0.0	22.3	22.3	33.9	20.9		4.0	2.7	6.2	67.7	0.0		67.7	-45.4
4	2004	0.0		0.0	42.0	42.0	50.9	52.2		7.7	5.2	11.6	127.6	0.0		127.6	-85.6
5	2005	0.0		0.0	30.4	30.4	43.3	31.3		5.5	3.8	8.3	92.2	0.0		92.2	-61.8
6	2006	15.6	0.5	1.6	0.7	18.5							0.0	3.5		3.5	15.0
7	2007	21.7	0.5	2.2	0.7	25.1							0.0	3.5		3.5	21.6
8	2008	25.2	0.5	2.6	0.7	29.0							0.0	3.5		3.5	25.5
9	2009	27.1	0.5	2.8	0.7	31.1							0.0	3.5		3.5	27.6
10	2010	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
11	2011	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
12	2012	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
13	2013	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
14	2014	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
15	2015	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
16	2016	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
17	2017	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
18	2018	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
19	2019	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
20	2020	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
21	2021	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
22	2022	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
23	2023	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
24	2024	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
25	2025	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
26	2026	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
27	2027	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
28	2028	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
29	2029	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
30	2030	28.1	0.5	2.9	0.7	32.2							0.0	3.5	20.0	23.5	8.7
31	2031	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
32	2032	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
33	2033	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
34	2034	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
35	2035	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
36	2036	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
37	2037	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
38	2038	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
39	2039	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
40	2040	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
41	2041	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
42	2042	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
43	2043	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
44	2044	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
45	2045	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
46	2046	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
47	2047	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
48	2048	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
49	2049	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
50	2050	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
51	2051	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
52	2052	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
53	2053	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
54	2054	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7
55	2055	28.1	0.5	2.9	0.7	32.2							0.0	3.5		3.5	28.7

EIRR=	10.4%			
B/C =	1.21	(at discount rate:	8%)	
NPV=	56.6	(at discount rate:	8%)	
NPV=	140.2	(at discount rate:	6%)	
NPV=	7.8	(at discount rate:	10%)	
NPV=	-21.8	(at discount rate:	12%)	

Table XVIII2.4.8: Cost-Benefit Analysis of the Priority Projects (7/10)

Azghar Unit: million DH

Year in order	Year	Benefit					Cost									Net Cash Flow
							Investment							O/M	Replace-ment	Total Cost	
		Agri-culture	Flood & erosion control	Other direct benefit	Neg. benefit to downstream reservoir	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Adminis-tration	Physical contingency	Sub-total				
1	2001	0.0	0.00	0.0	0.0	0.0	0.0	0.0	2.2		0.1	0.2	2.5	0.0		2.5	-2.5
2	2002	0.0	0.00	0.0	0.0	0.0	25.7	13.6	2.2	2.9	2.1	4.7	51.2	0.0		51.2	-51.2
3	2003	0.0	0.00	0.0	0.0	0.0	40.7	34.1		5.5	3.7	8.4	92.4	0.0		92.4	-92.4
4	2004	0.0	0.00	0.0	0.0	0.0	40.6	20.5		4.6	3.1	6.8	75.6	0.0		75.6	-75.6
5	2005	19.8	0.03	2.0	-22.1	-0.3							0.0	2.09		2.1	-2.4
6	2006	32.1	0.03	3.2	-22.1	13.2							0.0	2.09		2.1	11.1
7	2007	41.4	0.03	4.1	-22.1	23.5							0.0	2.09		2.1	21.4
8	2008	51.3	0.03	5.1	-22.1	34.4							0.0	2.09		2.1	32.3
9	2009	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
10	2010	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
11	2011	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
12	2012	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
13	2013	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
14	2014	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
15	2015	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
16	2016	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
17	2017	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
18	2018	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
19	2019	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
20	2020	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
21	2021	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
22	2022	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
23	2023	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
24	2024	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
25	2025	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
26	2026	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
27	2027	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
28	2028	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
29	2029	58.3	0.03	5.8	-22.1	42.1							0.0	2.09	13.4	15.5	26.6
30	2030	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
31	2031	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
32	2032	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
33	2033	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
34	2034	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
35	2035	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
36	2036	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
37	2037	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
38	2038	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
39	2039	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
40	2040	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
41	2041	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
42	2042	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
43	2043	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
44	2044	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
45	2045	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
46	2046	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
47	2047	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
48	2048	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
49	2049	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
50	2050	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
51	2051	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
52	2052	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
53	2053	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0
54	2054	58.3	0.03	5.8	-22.1	42.1							0.0	2.09		2.1	40.0

EIRR= 12.2%
B/C = 1.62 (at discount rate: 8%)
NPV= 120.9 (at discount rate: 8%)

NPV= 242.0 (at discount rate: 6%)
NPV= 48.5 (at discount rate: 10%)
NPV= 3.4 (at discount rate: 12%)

Table XVIII2.4.8: Cost-Benefit Analysis of the Priority Projects (8/10)

Azghar (including Indirect Benefit) Unit: million DH

Year in order	Year	Benefit						Cost										Net Cash Flow
								Investment							O/M	Replace-ment	Total Cost	
		Agri-culture	Flood & erosion control	Other direct benefit	Indirect Benefit	Neg. benefit to downstream reservoir	Total Benefit	Dam	Irrigation	Resettle-ment	Engr. services	Adminis-tration	Physical contingency	Sub-total				
1	2001	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	2.2		0.1	0.2	2.5	0.0		2.5	-2.5
2	2002	0.0	0.00	0.0	16.0	0.0	16.0	25.7	13.6	2.2	2.9	2.1	4.7	51.2	0.0		51.2	-35.2
3	2003	0.0	0.00	0.0	30.4	0.0	30.4	40.7	34.1		5.5	3.7	8.4	92.4	0.0		92.4	-62.0
4	2004	0.0	0.00	0.0	24.9	0.0	24.9	40.6	20.5		4.6	3.1	6.8	75.6	0.0		75.6	-50.7
5	2005	19.8	0.03	2.0	1.3	-22.1	1.0							0.0	2.09		2.1	-1.1
6	2006	32.1	0.03	3.2	1.3	-22.1	14.5							0.0	2.09		2.1	12.4
7	2007	41.4	0.03	4.1	1.3	-22.1	24.8							0.0	2.09		2.1	22.7
8	2008	51.3	0.03	5.1	1.3	-22.1	35.7							0.0	2.09		2.1	33.6
9	2009	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
10	2010	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
11	2011	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
12	2012	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
13	2013	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
14	2014	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
15	2015	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
16	2016	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
17	2017	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
18	2018	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
19	2019	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
20	2020	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
21	2021	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
22	2022	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
23	2023	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
24	2024	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
25	2025	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
26	2026	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
27	2027	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
28	2028	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
29	2029	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09	13.4	15.5	27.9
30	2030	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
31	2031	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
32	2032	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
33	2033	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
34	2034	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
35	2035	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
36	2036	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
37	2037	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
38	2038	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
39	2039	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
40	2040	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
41	2041	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
42	2042	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
43	2043	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
44	2044	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
45	2045	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
46	2046	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
47	2047	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
48	2048	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
49	2049	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
50	2050	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
51	2051	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
52	2052	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
53	2053	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3
54	2054	58.3	0.03	5.8	1.3	-22.1	43.4							0.0	2.09		2.1	41.3

EIRR= 16.6%
B/C = 1.97 (at discount rate: 8%)
NPV= 188.7 (at discount rate: 8%)

NPV= 317.8 (at discount rate: 6%)
NPV= 110.4 (at discount rate: 10%)
NPV= 60.5 (at discount rate: 12%)

Table XVIII2.4.8: Cost-Benefit Analysis of the Priority Projects (9/10)

Overall Plan

Unit: million DH

Year in order	Year	Benefit					Cost								Net Cash Flow
							Investment					O/M	Replace-ment	Total Cost	
		N'Fifikh	Taskourt	Timkit	Azghar	Total Benefit	N'Fifikh	Taskourt	Timkit	Azghar	Sub-total				
1	2001					-					-			-	-
2	2002					-					-			-	-
3	2003					-		14.2			14.2			14.2	-14.2
4	2004					-	1.7	49.8	3.2	2.5	57.2			57.2	-57.2
5	2005					-	50.4	104.7	35.5	51.2	241.8			241.8	-241.8
6	2006					-	106.8	182.7	67.7	92.4	449.6			449.6	-449.6
7	2007					-	56.2	155.1	127.6	75.6	414.5			414.5	-414.5
8	2008	9.6	29.1		-0.3	38.5			92.2		92.2	7.9		100.1	-61.6
9	2009	12.9	38.8	17.8	13.2	82.8					-	11.4		11.4	71.4
10	2010	16.1	45.4	24.4	23.5	109.4					-	11.4		11.4	98.0
11	2011	16.1	51.0	28.3	34.4	129.7					-	11.4		11.4	118.3
12	2012	17.2	54.7	30.4	42.1	144.4					-	11.4		11.4	133.0
13	2013	17.4	54.7	31.5	42.1	145.7					-	11.4		11.4	134.3
14	2014	18.6	54.7	31.5	42.1	146.9					-	11.4		11.4	135.5
15	2015	19.8	54.7	31.5	42.1	148.1					-	11.4		11.4	136.7
16	2016	19.8	54.7	31.5	42.1	148.1					-	11.4		11.4	136.7
17	2017	19.8	54.7	31.5	42.1	148.1					-	11.4		11.4	136.7
18	2018	19.8	54.7	31.5	42.1	148.1					-	11.4		11.4	136.7
19	2019	19.8	54.7	31.5	42.1	148.1					-	11.4		11.4	136.7
20	2020	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
21	2021	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
22	2022	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
23	2023	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
24	2024	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
25	2025	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
26	2026	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
27	2027	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
28	2028	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
29	2029	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
30	2030	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
31	2031	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
32	2032	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
33	2033	19.8	54.8	31.5	42.1	148.1					-	11.4	55.5	66.9	81.2
34	2034	19.8	54.8	31.5	42.1	148.1					-	11.4	20.0	31.4	116.7
35	2035	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
36	2036	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
37	2037	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
38	2038	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
39	2039	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
40	2040	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
41	2041	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
42	2042	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
43	2043	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
44	2044	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
45	2045	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
46	2046	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
47	2047	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
48	2048	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
49	2049	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
50	2050	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
51	2051	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
52	2052	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
53	2053	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
54	2054	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
55	2055	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
56	2056	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
57	2055	19.8	54.8	31.5	42.1	148.1					-	11.4		11.4	136.7
58	2056	-	-	31.5	-	31.5					-	3.5		3.5	28.0

EIRR=	8.5%			
B/C =	1.07	(at discount rate:	8%)	
NPV=	58.8	(at discount rate:	8%)	
NPV=	394.6	(at discount rate:	6%)	
NPV=	-117.7	(at discount rate:	10%)	
NPV=	-210.3	(at discount rate:	12%)	

Table XVIII2.4.8: Cost-Benefit Analysis of the Priority Projects (10/10)

Overall Plan (including Indirect Benefit)

Unit: million DH

Year in order	Year	Benefit					Cost								Net Cash Flow
							Investment					O/M	Replace-ment	Total Cost	
		N'Fifikh	Taskourt	Timkit	Azghar	Total Benefit	N'Fifikh	Taskourt	Timkit	Azghar	Sub-total				
1	2001					-					-			-	-
2	2002					-					-			-	-
3	2003					-		14.2			14.2			14.2	-14.2
4	2004		11.7			11.7	1.7	49.8	3.2	2.5	57.2			57.2	-45.5
5	2005	16.1	34.5	10.7	16.0	77.2	50.4	104.7	35.5	51.2	241.8			241.8	-164.6
6	2006	35.2	60.1	22.3	30.4	148.0	106.8	182.7	67.7	92.4	449.6			449.6	-301.6
7	2007	18.5	51.0	42.0	24.9	136.3	56.2	155.1	127.6	75.6	414.5			414.5	-278.2
8	2008	10.0	30.0	30.4	1.0	71.5			92.2		92.2	7.9		100.1	-28.6
9	2009	13.3	39.7	18.5	14.5	86.1					-	11.4		11.4	74.7
10	2010	16.5	46.3	25.1	24.8	112.7					-	11.4		11.4	101.3
11	2011	16.5	51.9	29.0	35.7	133.0					-	11.4		11.4	121.6
12	2012	17.6	55.6	31.1	43.4	147.7					-	11.4		11.4	136.3
13	2013	17.8	55.6	32.2	43.4	149.0					-	11.4		11.4	137.6
14	2014	19.0	55.6	32.2	43.4	150.2					-	11.4		11.4	138.8
15	2015	20.2	55.6	32.2	43.4	151.4					-	11.4		11.4	140.0
16	2016	20.2	55.6	32.2	43.4	151.4					-	11.4		11.4	140.0
17	2017	20.2	55.6	32.2	43.4	151.4					-	11.4		11.4	140.0
18	2018	20.2	55.6	32.2	43.4	151.4					-	11.4		11.4	140.0
19	2019	20.2	55.6	32.2	43.4	151.4					-	11.4		11.4	140.0
20	2020	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
21	2021	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
22	2022	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
23	2023	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
24	2024	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
25	2025	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
26	2026	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
27	2027	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
28	2028	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
29	2029	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
30	2030	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
31	2031	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
32	2032	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
33	2033	20.2	55.7	32.2	43.4	151.4					-	11.4	55.5	66.9	84.5
34	2034	20.2	55.7	32.2	43.4	151.4					-	11.4	20.0	31.4	120.0
35	2035	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
36	2036	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
37	2037	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
38	2038	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
39	2039	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
40	2040	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
41	2041	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
42	2042	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
43	2043	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
44	2044	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
45	2045	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
46	2046	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
47	2047	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
48	2048	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
49	2049	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
50	2050	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
51	2051	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
52	2052	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
53	2053	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
54	2054	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
55	2055	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
56	2056	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
57	2055	20.2	55.7	32.2	43.4	151.4					-	11.4		11.4	140.0
58	2056	-	-	32.2	-	32.2					-	3.5		3.5	28.7

EIRR=	12.0%			
B/C =	1.38	(at discount rate:	8%)	
NPV=	332.3	(at discount rate:	8%)	
NPV=	709.8	(at discount rate:	6%)	
NPV=	122.4	(at discount rate:	10%)	
NPV=	2.0	(at discount rate:	12%)	

Table XVIII3.1.1: Annual Disbursement Schedule (1/3)
(Financial Price, million DH)

N'Fifikh

Cost Item	Total			2001			2002			2003			2004			2005			2006			2007			2008		
	F.C.	L.C.	Total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total
1. Construction cost																											
Dam and appurtenant faciliti	93.0	50.1	143.1	-	-	-	-	-	-	-	-	-	-	-	-	22.3	12.0	34.3	47.4	25.6	73.0	23.3	12.5	35.8	-	-	-
Irrigation facilities	18.3	18.2	36.5	-	-	-	-	-	-	-	-	-	-	-	-	3.7	3.6	7.3	9.2	9.1	18.3	5.4	5.5	10.9	-	-	-
Water supply facilities	-	1.4	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	1.4	-	-	-
Sub-total of 1	111.3	69.7	181.0	-	-	-	-	-	-	-	-	-	-	-	-	26.0	15.6	41.6	56.6	34.7	91.3	28.7	19.4	48.1	-	-	-
2. Resettlement cost	-	3.3	3.3	-	-	-	-	-	-	-	-	-	-	1.7	1.7	-	1.6	1.6	-	-	-	-	-	-	-	-	-
3. Engineering services cost	8.2	4.5	12.7	-	-	-	-	-	-	-	-	-	-	-	-	1.9	1.0	2.9	4.1	2.3	6.4	2.2	1.2	3.4	-	-	-
4. Administration cost	-	9.2	9.2	-	-	-	-	-	-	-	-	-	-	0.1	0.1	-	2.2	2.2	-	4.6	4.6	-	2.3	2.3	-	-	-
5. Physical contingency	12.0	8.7	20.7	-	-	-	-	-	-	-	-	-	-	0.2	0.2	2.8	2.0	4.8	6.1	4.2	10.3	3.1	2.3	5.4	-	-	-
Sub-total of (1.- 5.)	131.5	95.4	226.9	-	-	-	-	-	-	-	-	-	-	2.0	2.0	30.7	22.4	53.1	66.8	45.8	112.6	34.0	25.2	59.2	-	-	-
6. Price contingency	25.7	18.6	44.3	-	-	-	-	-	-	-	-	-	-	0.3	0.3	4.9	3.6	8.5	13.0	8.9	21.9	7.8	5.8	13.6	-	-	-
Sub-total of (1.- 6.)	157.2	114.0	271.2	-	-	-	-	-	-	-	-	-	-	2.3	2.3	35.6	26.0	61.6	79.8	54.7	134.5	41.8	31.0	72.8	-	-	-
7. Value Added Tax	-	38.9	38.9	-	-	-	-	-	-	-	-	-	-	0.3	0.3	-	8.8	8.8	-	19.3	19.3	-	10.5	10.5	-	-	-
Total of (1.- 7.)	157.2	152.9	310.1	-	-	-	-	-	-	-	-	-	-	2.6	2.6	35.6	34.8	70.4	79.8	74.0	153.8	41.8	41.5	83.3	-	-	-

Note: 1) F.C. means foreign currency portion and L.C. means local currency portion.
2) Physical contingency of 10 % and price contingency of 3% per annum are assumed for both foreign and local currency portions.

Taskourt

Cost Item	Total			2001			2002			2003			2004			2005			2006			2007			2008		
	F.C.	L.C.	Total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total
1. Construction cost																											
Dam and appurtenant faciliti	179.0	96.4	275.4	-	-	-	-	-	-	-	-	-	19.7	10.6	30.3	41.2	22.2	63.4	59.1	31.8	90.9	59.0	31.8	90.8	-	-	-
Irrigation facilities	65.9	65.8	131.7	-	-	-	-	-	-	-	-	-	-	-	-	13.2	13.2	26.4	33.0	32.9	65.9	19.7	19.7	39.4	-	-	-
Water supply facilities	-	2.4	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	2.4	-	-	-
Sub-total of 1.2	244.9	164.6	409.5	-	-	-	-	-	-	-	-	-	19.7	10.6	30.3	54.4	35.4	89.8	92.1	64.7	156.8	78.7	53.9	132.6	-	-	-
2. Resettlement cost	-	28.5	28.5	-	-	-	-	-	-	-	14.3	14.3	-	14.2	14.2	-	-	-	-	-	-	-	-	-	-	-	-
3. Engineering services cost	18.6	10.1	28.7	-	-	-	-	-	-	-	-	-	1.4	0.7	2.1	4.1	2.2	6.3	7.1	3.9	11.0	6.0	3.3	9.3	-	-	-
4. Administration cost	-	21.9	21.9	-	-	-	-	-	-	-	0.7	0.7	-	2.2	2.2	-	4.5	4.5	-	7.8	7.8	-	6.7	6.7	-	-	-
5. Physical contingency	26.4	22.5	48.9	-	-	-	-	-	-	-	1.5	1.5	2.1	2.8	4.9	5.9	4.2	10.1	9.9	7.6	17.5	8.5	6.4	14.9	-	-	-
Sub-total of (1.- 5.)	289.9	247.6	537.5	-	-	-	-	-	-	-	16.5	16.5	23.2	30.5	53.7	64.4	46.3	110.7	109.1	84.0	193.1	93.2	70.3	163.5	-	-	-
6. Price contingency	55.8	45.2	101.0	-	-	-	-	-	-	-	1.5	1.5	2.9	3.8	6.7	10.3	7.4	17.7	21.2	16.3	37.5	21.4	16.2	37.6	-	-	-
Sub-total of (1.- 6.)	345.7	292.8	638.5	-	-	-	-	-	-	-	18.0	18.0	26.1	34.3	60.4	74.7	53.7	128.4	130.3	100.3	230.6	114.6	86.5	201.1	-	-	-
7. Value Added Tax	-	91.6	91.6	-	-	-	-	-	-	-	2.5	2.5	-	8.6	8.6	-	18.4	18.4	-	33.2	33.2	-	28.9	28.9	-	-	-
Total of (1.- 7.)	345.7	384.4	730.1	-	-	-	-	-	-	-	20.5	20.5	26.1	42.9	69.0	74.7	72.1	146.8	130.3	133.5	263.8	114.6	115.4	230.0	-	-	-

Note: 1) F.C. means foreign currency portion and L.C. means local currency portion.
2) Physical contingency of 10 % and price contingency of 3% per annum are assumed for both foreign and local currency portions.

Table XVIII3.1.1: Annual Disbursement Schedule (2/3)
(Financial Price, million DH)

Timkit

Cost Item	Total			2001			2002			2003			2004			2005			2006			2007			2008		
	F.C.	L.C.	Total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total
1. Construction cost																											
Dam and appurtenant faciliti	105.5	56.8	162.3	-	-	-	-	-	-	-	-	-	-	-	-	17.9	9.7	27.6	23.2	12.5	35.7	34.8	18.7	53.5	29.6	15.9	45.5
Irrigation facilities	56.2	56.1	112.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.2	11.2	22.4	28.1	28.1	56.2	16.9	16.8	33.7
Sub-total of 1.3	161.7	112.9	274.6	-	-	-	-	-	-	-	-	-	-	-	-	17.9	9.7	27.6	34.4	23.7	58.1	62.9	46.8	109.7	46.5	32.7	79.2
2. Resettlement cost	-	6.4	6.4	-	-	-	-	-	-	-	-	-	-	3.2	3.2	-	3.2	3.2	-	-	-	-	-	-	-	-	-
3. Engineering services cost	12.5	6.7	19.2	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.7	2.0	2.6	1.4	4.0	5.0	2.7	7.7	3.6	1.9	5.5
4. Administration cost	-	14.0	14.0	-	-	-	-	-	-	-	-	-	-	0.2	0.2	-	1.5	1.5	-	2.9	2.9	-	5.5	5.5	-	3.9	3.9
5. Physical contingency	17.4	14.0	31.4	-	-	-	-	-	-	-	-	-	-	0.3	0.3	1.9	1.5	3.4	3.7	2.8	6.5	6.8	5.5	12.3	5.0	3.9	8.9
Sub-total of (1.- 5.)	191.6	154.0	345.6	-	-	-	-	-	-	-	-	-	-	3.7	3.7	21.1	16.6	37.7	40.7	30.8	71.5	74.7	60.5	135.2	55.1	42.4	97.5
6. Price contingency	43.2	34.3	77.5	-	-	-	-	-	-	-	-	-	-	0.5	0.5	3.4	2.6	6.0	7.9	6.0	13.9	17.2	13.9	31.1	14.7	11.3	26.0
Sub-total of (1.- 6.)	234.8	188.3	423.1	-	-	-	-	-	-	-	-	-	-	4.2	4.2	24.5	19.2	43.7	48.6	36.8	85.4	91.9	74.4	166.3	69.8	53.7	123.5
7. Value Added Tax	-	60.8	60.8	-	-	-	-	-	-	-	-	-	-	0.6	0.6	-	6.3	6.3	-	12.3	12.3	-	23.9	23.9	-	17.7	17.7
Total of (1.- 7.)	234.8	249.1	483.9	-	-	-	-	-	-	-	-	-	-	4.8	4.8	24.5	25.5	50.0	48.6	49.1	97.7	91.9	98.3	190.2	69.8	71.4	141.2

Note: 1) F.C. means foreign currency portion and L.C. means local currency portion.
2) Physical contingency of 10 % and price contingency of 3% per annum are assumed for both foreign and local currency portions.

Azghar

Cost Item	Total			2001			2002			2003			2004			2005			2006			2007			2008		
	F.C.	L.C.	Total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total
1. Construction cost																											
Dam and appurtenant faciliti	73.1	39.4	112.5	-	-	-	-	-	-	-	-	-	-	-	-	17.5	9.5	27.0	27.8	15.0	42.8	27.8	14.9	42.7	-	-	-
Irrigation facilities	36.7	36.6	73.3	-	-	-	-	-	-	-	-	-	-	-	-	7.3	7.3	14.6	18.4	18.3	36.7	11.0	11.0	22.0	-	-	-
Sub-total of 1.4	109.8	76.0	185.8	-	-	-	-	-	-	-	-	-	-	-	-	24.8	16.8	41.6	46.2	33.3	79.5	38.8	25.9	64.7	-	-	-
2. Resettlement cost	-	5.1	5.1	-	-	-	-	-	-	-	-	-	-	2.6	2.6	-	2.5	2.5	-	-	-	-	-	-	-	-	-
3. Engineering services cost	8.5	4.5	13.0	-	-	-	-	-	-	-	-	-	-	-	-	1.9	1.0	2.9	3.6	1.9	5.5	3.0	1.6	4.6	-	-	-
4. Administration cost	-	9.5	9.5	-	-	-	-	-	-	-	-	-	-	0.1	0.1	-	2.2	2.2	-	4.0	4.0	-	3.2	3.2	-	-	-
5. Physical contingency	11.8	9.5	21.3	-	-	-	-	-	-	-	-	-	-	0.3	0.3	2.7	2.3	5.0	5.0	3.9	8.9	4.1	3.0	7.1	-	-	-
Sub-total of (1.- 5.)	130.1	104.6	234.7	-	-	-	-	-	-	-	-	-	-	3.0	3.0	29.4	24.8	54.2	54.8	43.1	97.9	45.9	33.7	79.6	-	-	-
6. Price contingency	25.9	20.4	46.3	-	-	-	-	-	-	-	-	-	-	0.4	0.4	4.7	3.9	8.6	10.6	8.4	19.0	10.6	7.7	18.3	-	-	-
Sub-total of (1.- 6.)	156.0	125.0	281.0	-	-	-	-	-	-	-	-	-	-	3.4	3.4	34.1	28.7	62.8	65.4	51.5	116.9	56.5	41.4	97.9	-	-	-
7. Value Added Tax	-	40.4	40.4	-	-	-	-	-	-	-	-	-	-	0.5	0.5	-	9.0	9.0	-	16.8	16.8	-	14.1	14.1	-	-	-
Total of (1.- 7.)	156.0	165.4	321.4	-	-	-	-	-	-	-	-	-	-	3.9	3.9	34.1	37.7	71.8	65.4	68.3	133.7	56.5	55.5	112.0	-	-	-

Note: 1) F.C. means foreign currency portion and L.C. means local currency portion.
2) Physical contingency of 10 % and price contingency of 3% per annum are assumed for both foreign and local currency portions.

Table XVIII3.1.1: Annual Disbursement Schedule (3/3)
(Financial Price, million DH)

Overall Plan

Cost Item	Total			2001			2002			2003			2004			2005			2006			2007			2008		
	F.C.	L.C.	Total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total	F.C.	L.C.	Sub-total
1. Construction cost																											
Dam and appurtenant faciliti	450.6	242.7	693.3	-	-	-	-	-	-	-	-	-	19.7	10.6	30.3	98.9	53.4	152.3	157.5	84.9	242.4	144.9	77.9	222.8	29.6	15.9	45.5
Irrigation facilities	177.1	176.7	353.8	-	-	-	-	-	-	-	-	-	-	-	-	24.2	24.1	48.3	71.8	71.5	143.3	64.2	64.3	128.5	16.9	16.8	33.7
Water supply facilities	-	3.8	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.8	3.8	-	-	-
Sub-total of 1	627.7	423.2	1,050.9	-	-	-	-	-	-	-	-	-	19.7	10.6	30.3	123.1	77.5	200.6	229.3	156.4	385.7	209.1	146.0	355.1	46.5	32.7	79.2
2. Resettlement cost	-	43.3	43.3	-	-	-	-	-	-	-	14.3	14.3	-	21.7	21.7	-	7.3	7.3	-	-	-	-	-	-	-	-	-
3. Engineering services cost	47.8	25.8	73.6	-	-	-	-	-	-	-	-	-	1.4	0.7	2.1	9.2	4.9	14.1	17.4	9.5	26.9	16.2	8.8	25.0	3.6	1.9	5.5
4. Administration cost	-	54.6	54.6	-	-	-	-	-	-	-	0.7	0.7	-	2.6	2.6	-	10.4	10.4	-	19.3	19.3	-	17.7	17.7	-	3.9	3.9
5. Physical contingency	67.6	54.7	122.3	-	-	-	-	-	-	-	1.5	1.5	2.1	3.6	5.7	13.3	10.0	23.3	24.7	18.5	43.2	22.5	17.2	39.7	5.0	3.9	8.9
Sub-total of (1.- 5.)	743.1	601.6	1,344.7	-	-	-	-	-	-	-	16.5	16.5	23.2	39.2	62.4	145.6	110.1	255.7	271.4	203.7	475.1	247.8	189.7	437.5	55.1	42.4	97.5
6. Price contingency	150.6	118.5	269.1	-	-	-	-	-	-	-	1.5	1.5	2.9	5.0	7.9	23.3	17.5	40.8	52.7	39.6	92.3	57.0	43.6	100.6	14.7	11.3	26.0
Sub-total of (1.- 6.)	893.7	720.1	1,613.8	-	-	-	-	-	-	-	18.0	18.0	26.1	44.2	70.3	168.9	127.6	296.5	324.1	243.3	567.4	304.8	233.3	538.1	69.8	53.7	123.5
7. Value Added Tax	-	231.7	231.7	-	-	-	-	-	-	-	2.5	2.5	-	10.0	10.0	-	42.5	42.5	-	81.6	81.6	-	77.4	77.4	-	17.7	17.7
Total of (1.- 7.)	893.7	951.8	1,845.5	-	-	-	-	-	-	-	20.5	20.5	26.1	54.2	80.3	168.9	170.1	339.0	324.1	324.9	649.0	304.8	310.7	615.5	69.8	71.4	141.2

Note: 1) F.C. means foreign currency portion and L.C. means local currency portion.
2) Physical contingency of 10 % and price contingency of 3% per annum are assumed for both foreign and local currency portions.

Table XVIII3.2.1: Financial Cash Flow Statement for Implementation of the Projects (1/5)

N'Fifikh **Unit: Million DH**

Year in order	Year	Capital Cost			Foreign Loan Accumulated 75% of (a)	A part of capital cost allocated by the Government	Cash Outflow							Cash Inflow				Balance (c) - (b)
		F.C.	L.C.	Total (a)			O & M cost			Replace-ment cost	Repayment of Loan		Total (b)	Irrigation water	Water supply	Government subsidy	Total (c)	
							Dam	Irrigation	Water sup.		Interest	Capital						
1	2001										-		-			-	-	-
2	2002										-		-			-	-	-
3	2003										-		-			-	-	-
4	2004		2.6	2.6	-	2.6					-		-			-	-	-
5	2005	35.6	34.8	70.4	54.7	15.7					-		-			-	-	-
6	2006	79.8	74.0	153.8	170.1	38.4					1.2		1.2			1.2	1.2	-
7	2007	41.8	41.5	83.3	232.5	20.9					3.7		3.7			3.7	3.7	-
8	2008				232.5		1.0	0.5	0.1		5.1		6.7	0.9	0.1	5.7	6.7	-
9	2009				232.5		1.0	0.7	0.1		5.1		6.9	1.3	0.1	5.5	6.9	-
10	2010				232.5		1.1	0.9	0.1		5.1		7.2	1.6	0.1	5.5	7.2	-
11	2011				232.5		1.1	0.9	0.1		5.1		7.2	1.6	0.1	5.5	7.2	-
12	2012				232.5		1.1	1.0	0.1		5.1		7.3	1.7	0.1	5.5	7.3	-
13	2013				232.5		1.2	1.0	0.1		5.1		7.4	1.7	0.2	5.6	7.4	-
14	2014				232.5		1.2	1.1	0.1		5.1		7.5	1.8	0.2	5.6	7.5	-
15	2015				220.8		1.2	1.3	0.1		5.1	11.7	19.4	2.0	0.2	17.3	19.4	-
16	2016				209.1		1.3	1.3	0.1		4.9	11.7	19.3	2.0	0.2	17.1	19.3	-
17	2017				197.4		1.3	1.3	0.1		4.6	11.7	19.0	2.0	0.2	16.8	19.0	-
18	2018				185.7		1.3	1.4	0.2		4.3	11.7	18.9	2.0	0.2	16.8	18.9	-
19	2019				174.0		1.4	1.4	0.2		4.1	11.7	18.8	2.0	0.2	16.6	18.8	-
20	2020				162.3		1.4	1.5	0.2		3.8	11.7	18.6	2.0	0.2	16.5	18.6	-
21	2021				150.6		1.5	1.5	0.2		3.6	11.7	18.5	2.0	0.2	16.3	18.5	-
22	2022				138.9		1.5	1.5	0.2		3.3	11.7	18.2	2.0	0.2	16.1	18.2	-
23	2023				127.2		1.6	1.6	0.2		3.1	11.7	18.2	2.0	0.2	16.0	18.2	-
24	2024				115.5		1.6	1.6	0.2		2.8	11.7	17.9	2.0	0.2	15.7	17.9	-
25	2025				103.8		1.6	1.7	0.2		2.5	11.7	17.7	2.0	0.2	15.6	17.7	-
26	2026				92.1		1.7	1.7	0.2		2.3	11.7	17.6	2.0	0.2	15.4	17.6	-
27	2027				80.4		1.7	1.8	0.2		2.0	11.7	17.4	2.0	0.2	15.3	17.4	-
28	2028				68.7		1.8	1.8	0.2		1.8	11.7	17.3	2.0	0.2	15.1	17.3	-
29	2029				57.0		1.9	1.9	0.2		1.5	11.7	17.2	2.0	0.2	15.1	17.2	-
30	2030				45.3		1.9	1.9	0.2		1.3	11.7	17.0	2.0	0.2	14.8	17.0	-
31	2031				33.6		2.0	2.0	0.2		1.0	11.7	16.9	2.0	0.2	14.7	16.9	-
32	2032				21.9		2.0	2.1	0.2		0.7	11.7	16.7	2.0	0.2	14.6	16.7	-
33	2033				10.2		2.1	2.1	0.2	31.5	0.5	11.7	48.1	2.0	0.2	45.9	48.1	-
34	2034				-		2.2	2.2	0.2		0.2	10.2	15.0	2.0	0.2	12.9	15.0	-
35	2035				-		2.2	2.3	0.3				4.8	2.0	0.2	2.6	4.8	-
36	2036				-		2.3	2.3	0.3				4.9	2.0	0.2	2.7	4.9	-
37	2037				-		2.4	2.4	0.3				5.1	2.0	0.2	2.9	5.1	-

Note: 1) F.C. means foreign currency components and L.C. means local currency components.

2) 75% of the capital costs are assumed to be financed by bilateral or international organization as far as the costs are not non-eligible items.

3) The non-eligible items are costs for land acquisition, house compensation, administration, and any type of taxes and duties.

4) The assumed condition of finance is with an interest rate of 2.2% per annum for repayment period of 30 years including a grace period of 10 years.

Table XVIII3.2.1: Financial Cash Flow Statement for Implementation of the Projects (2/5)

Taskourt **Unit: Million DH**

Year in order	Year	Capital Cost			Foreign Loan Accumulated 75% of (a)	A part of capital cost allocated by the Government	Cash Outflow							Cash Inflow				Balance (c) - (b)
		F.C.	L.C.	Total (a)			O & M cost			Replace-ment cost	Repayment of Loan		Total (b)	Irrigation water	Water supply	Government subsidy	Total (c)	
							Dam	Irrigation	Water sup.		Interest	Capital						
1	2001										-		-			-	-	-
2	2002										-		-			-	-	-
3	2003		20.5	20.5	-	20.5					-		-			-	-	-
4	2004	26.1	42.9	69.0	40.1	28.9					-		-			-	-	-
5	2005	74.7	72.1	146.8	162.6	24.3					0.9		0.9			0.9	0.9	-
6	2006	130.3	133.5	263.8	375.0	51.4					3.6		3.6			3.6	3.6	-
7	2007	114.6	115.4	230.0	547.5	57.5					8.3		8.3			8.3	8.3	-
8	2008				547.5	-	1.9	1.9	0.2		12.0		16.0	3.8	0.3	12.0	16.0	-
9	2009				547.5		2.0	2.7	0.2		12.0		16.9	5.0	0.3	11.7	16.9	-
10	2010				547.5		2.0	3.2	0.2		12.0		17.4	5.9	0.3	11.3	17.4	-
11	2011				547.5		2.1	3.7	0.2		12.0		18.0	6.6	0.3	11.2	18.0	-
12	2012				547.5		2.2	4.1	0.2		12.0		18.5	7.1	0.3	11.2	18.5	-
13	2013				547.5		2.2	4.3	0.2		12.0		18.7	7.1	0.3	11.4	18.7	-
14	2014				520.1		2.3	4.4	0.2		12.0	27.4	46.3	7.1	0.3	39.0	46.3	-
15	2015				492.7		2.4	4.5	0.2		11.4	27.4	45.9	7.1	0.3	38.6	45.9	-
16	2016				465.3		2.4	4.6	0.2		10.8	27.4	45.4	7.1	0.3	38.1	45.4	-
17	2017				437.9		2.5	4.8	0.2		10.2	27.4	45.1	7.1	0.3	37.8	45.1	-
18	2018				410.5		2.6	4.9	0.3		9.6	27.4	44.8	7.1	0.3	37.5	44.8	-
19	2019				383.1		2.7	5.1	0.3		9.0	27.4	44.5	7.1	0.3	37.2	44.5	-
20	2020				355.7		2.7	5.2	0.3		8.4	27.4	44.0	7.1	0.3	36.7	44.0	-
21	2021				328.3		2.8	5.4	0.3		7.8	27.4	43.7	7.1	0.3	36.3	43.7	-
22	2022				300.9		2.9	5.6	0.3		7.2	27.4	43.4	7.1	0.3	36.0	43.4	-
23	2023				273.5		3.0	5.7	0.3		6.6	27.4	43.0	7.1	0.3	35.6	43.0	-
24	2024				246.1		3.1	5.9	0.3		6.0	27.4	42.7	7.1	0.3	35.3	42.7	-
25	2025				218.7		3.2	6.1	0.3		5.4	27.4	42.4	7.1	0.3	35.0	42.4	-
26	2026				191.3		3.3	6.2	0.3		4.8	27.4	42.0	7.1	0.3	34.6	42.0	-
27	2027				163.9		3.4	6.4	0.3		4.2	27.4	41.7	7.1	0.3	34.3	41.7	-
28	2028				136.5		3.5	6.6	0.3		3.6	27.4	41.4	7.1	0.3	34.0	41.4	-
29	2029				109.1		3.6	6.8	0.4		3.0	27.4	41.2	7.1	0.3	33.8	41.2	-
30	2030				81.7		3.7	7.0	0.4		2.4	27.4	40.9	7.1	0.3	33.5	40.9	-
31	2031				54.3		3.8	7.2	0.4		1.8	27.4	40.6	7.1	0.3	33.2	40.6	-
32	2032				26.9		3.9	7.5	0.4		1.2	27.4	40.4	7.1	0.3	33.0	40.4	-
33	2033				-		4.0	7.7	0.4	78.6	0.6	26.9	118.2	7.1	0.3	110.8	118.2	-
34	2034				-		4.1	7.9	0.4				12.4	7.1	0.3	5.0	12.4	-
35	2035				-		4.3	8.2	0.4				12.9	7.1	0.3	5.5	12.9	-
36	2036				-		4.4	8.4	0.4				13.2	7.1	0.3	5.8	13.2	-
37	2037				-		4.5	8.6	0.4				13.5	7.1	0.3	6.1	13.5	-

Note: 1) F.C. means foreign currency components and L.C. means local currency components.
2) 75% of the capital costs are assumed to be financed by bilateral or international organization as far as the costs are not non-eligible items.
3) The non-eligible items are costs for land acquisition, house compensation, administration, and any type of taxes and duties.
4) The assumed condition of finance is with an interest rate of 2.2% per annum for repayment period of 30 years including a grace period of 10 years.
5) The price escalation of 3% per annum is assumed for the capital cost, O & M cost, and replacement cost of facilities.
6) Annual irrigation water charges are set to cover O & M and replacement cost of irrigation facilities for 25 years.

Table XVIII3.2.1: Financial Cash Flow Statement for Implementation of the Projects (3/5)

Timkit **Unit: Million DH**

Year in order	Year	Capital Cost			Foreign Loan Accumulated 75% of (a)	A part of capital cost allocated by the Government	Cash Outflow							Cash Inflow				Balance (c) - (b)
		F.C.	L.C.	Total (a)			O & M cost			Replace-ment cost	Repayment of Loan		Total (b)	Irrigation water	Water supply	Government subsidy	Total (c)	
							Dam	Irrigation	Water sup.		Interest	Capital						
1	2001										-		-			-	-	-
2	2002										-		-			-	-	-
3	2003										-		-			-	-	-
4	2004		4.8	4.8	-	4.8					-		-			-	-	-
5	2005	24.5	25.5	50.0	37.7	12.3					-		-			-	-	-
6	2006	48.6	49.1	97.7	114.3	21.1					0.8		0.8			0.8	0.8	-
7	2007	91.9	98.3	190.2	257.0	47.5					2.5		2.5			2.5	2.5	-
8	2008	69.8	71.4	141.2	362.9	35.3					5.7		5.7			5.7	5.7	-
9	2009				362.9		1.2	1.8			8.0		11.0	3.5		7.5	11.0	-
10	2010				362.9		1.2	2.6			8.0		11.8	4.8		7.0	11.8	-
11	2011				362.9		1.2	3.1			8.0		12.3	5.6		6.7	12.3	-
12	2012				362.9		1.3	3.4			8.0		12.7	6.0		6.7	12.7	-
13	2013				362.9		1.3	3.6			8.0		12.9	6.2		6.7	12.9	-
14	2014				362.9		1.4	3.7			8.0		13.1	6.2		6.9	13.1	-
15	2015				344.7		1.4	3.8			8.0	18.2	31.4	6.2		25.2	31.4	-
16	2016				326.5		1.4	4.0			7.6	18.2	31.2	6.2		25.0	31.2	-
17	2017				308.3		1.5	4.1			7.2	18.2	31.0	6.2		24.8	31.0	-
18	2018				290.1		1.5	4.2			6.8	18.2	30.7	6.2		24.5	30.7	-
19	2019				271.9		1.6	4.3			6.4	18.2	30.5	6.2		24.3	30.5	-
20	2020				253.7		1.6	4.5			6.0	18.2	30.3	6.2		24.1	30.3	-
21	2021				235.5		1.7	4.6			5.6	18.2	30.1	6.2		23.9	30.1	-
22	2022				217.3		1.7	4.7			5.2	18.2	29.8	6.2		23.6	29.8	-
23	2023				199.1		1.8	4.9			4.8	18.2	29.7	6.2		23.5	29.7	-
24	2024				180.9		1.8	5.0			4.4	18.2	29.4	6.2		23.2	29.4	-
25	2025				162.7		1.9	5.2			4.0	18.2	29.3	6.2		23.1	29.3	-
26	2026				144.5		1.9	5.3			3.6	18.2	29.0	6.2		22.8	29.0	-
27	2027				126.3		2.0	5.5			3.2	18.2	28.9	6.2		22.7	28.9	-
28	2028				108.1		2.0	5.7			2.8	18.2	28.7	6.2		22.5	28.7	-
29	2029				89.9		2.1	5.8			2.4	18.2	28.5	6.2		22.3	28.5	-
30	2030				71.7		2.2	6.0			2.0	18.2	28.4	6.2		22.2	28.4	-
31	2031				53.5		2.2	6.2			1.6	18.2	28.2	6.2		22.0	28.2	-
32	2032				35.3		2.3	6.4			1.2	18.2	28.1	6.2		21.9	28.1	-
33	2033				17.1		2.4	6.6			0.8	18.2	28.0	6.2		21.8	28.0	-
34	2034				-		2.4	6.8		58.1	0.4	17.1	84.8	6.2		78.6	84.8	-
35	2035				-		2.5	7.0					9.5	6.2		3.3	9.5	-
36	2036				-		2.6	7.2					9.8	6.2		3.6	9.8	-
37	2037				-		2.7	7.4					10.1	6.2		3.9	10.1	-

Note: 1) F.C. means foreign currency components and L.C. means local currency components.

2) 75% of the capital costs are assumed to be financed by bilateral or international organization as far as the costs are not non-eligible items.

3) The non-eligible items are costs for land acquisition, house compensation, administration, and any type of taxes and duties.

4) The assumed condition of finance is with an interest rate of 2.2% per annum for repayment period of 30 years including a grace period of 10 years.

5) The price escalation of 3% per annum is assumed for the capital cost, O & M cost, and replacement cost of facilities.

6) Annual irrigation water charges are set to cover O & M and replacement cost of irrigation facilities for 25 years.

Table XVIII3.2.1: Financial Cash Flow Statement for Implementation of the Projects (4/5)

Azghar **Unit: Million DH**

Year in order	Year	Capital Cost			Foreign Loan Accumulated 75% of (a)	A part of capital cost allocated by the Government	Cash Outflow							Cash Inflow				Balance (c) - (b)
		F.C.	L.C.	Total (a)			O & M cost			Replace-ment cost	Repayment of Loan		Total (b)	Irrigation water	Water supply	Government subsidy	Total (c)	
							Dam	Irrigation	Water sup.		Interest	Capital						
1	2001										-		-			-	-	-
2	2002										-		-			-	-	-
3	2003										-		-			-	-	-
4	2004		3.9	3.9	-	3.9					-		-			-	-	-
5	2005	34.1	37.7	71.8	56.7	15.1					-		-			-	-	-
6	2006	65.4	68.3	133.7	157.0	33.4					1.2		1.2			1.2	1.2	-
7	2007	56.5	55.5	112.0	241.0	28.0					3.5		3.5			3.5	3.5	-
8	2008				241.0		0.8	0.7			5.3		6.8	1.4		5.4	6.8	-
9	2009				241.0		0.8	1.2			5.3		7.3	2.2		5.1	7.3	-
10	2010				241.0		0.8	1.5			5.3		7.6	2.8		4.8	7.6	-
11	2011				241.0		0.9	2.0			5.3		8.2	3.5		4.7	8.2	-
12	2012				241.0		0.9	2.3			5.3		8.5	4.0		4.5	8.5	-
13	2013				241.0		0.9	2.4			5.3		8.6	4.0		4.6	8.6	-
14	2014				241.0		0.9	2.4			5.3		8.6	4.0		4.6	8.6	-
15	2015				228.9		1.0	2.5			5.3	12.1	20.9	4.0		16.9	20.9	-
16	2016				216.8		1.0	2.6			5.0	12.1	20.7	4.0		16.7	20.7	-
17	2017				204.7		1.0	2.7			4.8	12.1	20.6	4.0		16.6	20.6	-
18	2018				192.6		1.1	2.7			4.5	12.1	20.4	4.0		16.4	20.4	-
19	2019				180.5		1.1	2.8			4.2	12.1	20.2	4.0		16.2	20.2	-
20	2020				168.4		1.1	2.9			4.0	12.1	20.1	4.0		16.1	20.1	-
21	2021				156.3		1.2	3.0			3.7	12.1	20.0	4.0		16.0	20.0	-
22	2022				144.2		1.2	3.1			3.4	12.1	19.8	4.0		15.8	19.8	-
23	2023				132.1		1.2	3.2			3.2	12.1	19.7	4.0		15.7	19.7	-
24	2024				120.0		1.3	3.3			2.9	12.1	19.6	4.0		15.6	19.6	-
25	2025				107.9		1.3	3.4			2.6	12.1	19.4	4.0		15.4	19.4	-
26	2026				95.8		1.3	3.5			2.4	12.1	19.3	4.0		15.3	19.3	-
27	2027				83.7		1.4	3.6			2.1	12.1	19.2	4.0		15.2	19.2	-
28	2028				71.6		1.4	3.7			1.8	12.1	19.0	4.0		15.0	19.0	-
29	2029				59.5		1.5	3.8			1.6	12.1	19.0	4.0		15.0	19.0	-
30	2030				47.4		1.5	3.9			1.3	12.1	18.8	4.0		14.8	18.8	-
31	2031				35.3		1.5	4.0			1.0	12.1	18.6	4.0		14.6	18.6	-
32	2032				23.2		1.6	4.2			0.8	12.1	18.7	4.0		14.7	18.7	-
33	2033				11.1		1.6	4.3		37.8	0.5	12.1	56.3	4.0		52.3	56.3	-
34	2034				-		1.7	4.4			0.2	11.1	17.4	4.0		13.4	17.4	-
35	2035				-		1.7	4.5					6.2	4.0		2.2	6.2	-
36	2036				-		1.8	4.7					6.5	4.0		2.5	6.5	-
37	2037				-		1.8	4.8					6.6	4.0		2.6	6.6	-

Note: 1) F.C. means foreign currency components and L.C. means local currency components.
2) 75% of the capital costs are assumed to be financed by bilateral or international organization as far as the costs are not non-eligible items.
3) The non-eligible items are costs for land acquisition, house compensation, administration, and any type of taxes and duties.
4) The assumed condition of finance is with an interest rate of 2.2% per annum for repayment period of 30 years including a grace period of 10 years.
5) The price escalation of 3% per annum is assumed for the capital cost, O & M cost, and replacement cost of facilities.
6) Annual irrigation water charges are set to cover O & M and replacement cost of irrigation facilities for 25 years.

Table XVIII3.2.1: Financial Cash Flow Statement for Implementation of the Projects (5/5)

Overall Plan **Unit: Million DH**

Year in order	Year	Capital Cost			Foreign Loan Accumulated 75% of (a)	A part of capital cost allocated by the Government	Cash Outflow							Cash Inflow				Balance (c) - (b)
		F.C.	L.C.	Total (a)			O & M cost			Replace-ment cost	Repayment of Loan		Total (b)	Irrigation water	Water supply	Government subsidy	Total (c)	
							Dam	Irrigation	Water sup.		Interest	Capital						
1	2001												-				-	-
2	2002												-				-	-
3	2003	-	20.5	20.5	-	20.5							-				-	-
4	2004	26.1	54.2	80.3	40.1	40.2							-				-	-
5	2005	168.9	170.1	339.0	311.7	67.4					0.9		0.9			0.9	0.9	-
6	2006	324.1	324.9	649.0	816.4	144.3					6.9		6.9			6.9	6.9	-
7	2007	304.8	310.7	615.5	1,278.0	153.9					18.0		18.0			18.0	18.0	-
8	2008	69.8	71.4	141.2	1,383.9	35.3	3.7	3.1	0.3		28.1		35.2	6.1	0.4	28.7	35.2	-
9	2009				1,383.9		5.0	6.4	0.3		30.4		42.1	12.0	0.4	29.7	42.1	-
10	2010				1,383.9		5.1	8.2	0.3		30.4		44.0	15.1	0.4	28.5	44.0	-
11	2011				1,383.9		5.3	9.7	0.3		30.4		45.7	17.3	0.4	28.0	45.7	-
12	2012				1,383.9		5.5	10.8	0.3		30.4		47.0	18.8	0.4	27.8	47.0	-
13	2013				1,383.9		5.6	11.3	0.3		30.4		47.6	19.0	0.4	28.2	47.6	-
14	2014				1,356.5		5.8	11.6	0.3		30.4	27.4	75.5	19.1	0.4	56.0	75.5	-
15	2015				1,287.1		6.0	12.1	0.3		29.8	69.4	117.6	19.3	0.4	97.9	117.6	-
16	2016				1,217.7		6.1	12.5	0.3		28.3	69.4	116.6	19.3	0.4	96.9	116.6	-
17	2017				1,148.3		6.3	12.9	0.3		26.8	69.4	115.7	19.3	0.4	96.0	115.7	-
18	2018				1,078.9		6.5	13.2	0.5		25.3	69.4	114.9	19.3	0.4	95.1	114.9	-
19	2019				1,009.5		6.8	13.6	0.5		23.7	69.4	114.0	19.3	0.4	94.3	114.0	-
20	2020				940.1		6.8	14.1	0.5		22.2	69.4	113.0	19.3	0.4	93.3	113.0	-
21	2021				870.7		7.2	14.5	0.5		20.7	69.4	112.3	19.3	0.4	92.5	112.3	-
22	2022				801.3		7.3	14.9	0.5		19.2	69.4	111.3	19.3	0.4	91.5	111.3	-
23	2023				731.9		7.6	15.4	0.5		17.6	69.4	110.5	19.3	0.4	90.8	110.5	-
24	2024				662.5		7.8	15.8	0.5		16.1	69.4	109.6	19.3	0.4	89.9	109.6	-
25	2025				593.1		8.0	16.4	0.5		14.6	69.4	108.9	19.3	0.4	89.1	108.9	-
26	2026				523.7		8.2	16.7	0.5		13.0	69.4	107.8	19.3	0.4	88.1	107.8	-
27	2027				454.3		8.5	17.3	0.5		11.5	69.4	107.2	19.3	0.4	87.5	107.2	-
28	2028				384.9		8.7	17.8	0.5		10.0	69.4	106.4	19.3	0.4	86.7	106.4	-
29	2029				315.5		9.1	18.3	0.6		8.5	69.4	105.9	19.3	0.4	86.1	105.9	-
30	2030				246.1		9.3	18.8	0.6		6.9	69.4	105.0	19.3	0.4	85.3	105.0	-
31	2031				176.7		9.5	19.4	0.6		5.4	69.4	104.3	19.3	0.4	84.6	104.3	-
32	2032				107.3		9.8	20.2	0.6		3.9	69.4	103.9	19.3	0.4	84.1	103.9	-
33	2033				38.4		10.1	20.7	0.6	147.9	2.4	68.9	250.6	19.3	0.4	230.8	250.6	-
34	2034				-		10.4	21.3	0.6	58.1	0.8	38.4	129.6	19.3	0.4	109.9	129.6	-
35	2035				-		10.7	22.0	0.7				33.4	19.3	0.4	13.7	33.4	-
36	2036				-		11.1	22.6	0.7				34.4	19.3	0.4	14.7	34.4	-
37	2037				-		11.4	23.2	0.7				35.3	19.3	0.4	15.6	35.3	-

Note: 1) F.C. means foreign currency components and L.C. means local currency components.

2) 75% of the capital costs are assumed to be financed by bilateral or international organization as far as the costs are not non-eligible items.

3) The non-eligible items are costs for land acquisition, house compensation, administration, and any type of taxes and duties.

4) The assumed condition of finance is with an interest rate of 2.2% per annum for repayment period of 30 years including a grace period of 10 years.

5) The price escalation of 3% per annum is assumed for the capital cost, O & M cost, and replacement cost of facilities.

6) Annual irrigation water charges are set to cover O & M and replacement cost of irrigation facilities for 25 years.

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IMPLEMENTATION PROGRAM

XIX1 General

The implementation program of the Projects are presented in Chapter 11 of Main Report. Therefore, only the supporting information will be provided in this Supporting Report XIX.

XIX2 Financial Situation of the Ministries Concerned

XIX2.1 Ministry of Equipment

Annual investment budget of the Ministry of Equipment was approximately 2.4 billion DH during four fiscal years from 1996/97 to 1999/200 while the budget of thr Hydraulic Sector was approximately one billion DH during the same period. Summary of the investment budget is as shown in Table XIX2.1.

Annual budget for construction and maintenance of the large dams is as shown below. The table shows that relatively large amount of the maintenance cost has been allocated every year. Ratio of the maintenance cost to the construction cost is almost 10 percent in 1999/00 fiscal year.

Investment and Maintenance Cost for Large Dams

Fiscal year	Investment (DH)	Maintenance cost (DH)
1995	745,250,000	73,300,000
1996 (1st semester)	348,105,000	29,210,000
1996/97	799,746,000	128,213,000
1997/98	809,698,000	73,208,000
1998/99	608,882,000	91,447,950
1999/00	589,470,000	55,960,000

A list of large dams constructed, under construction, and to be constructed is presented in Table XIX2.3 and present status of the water resources development projects planed in the Five-Year Development Plan of Ministry of Equipment is as shown in Table XIX2.4.

Construction cost of Taskourt project, one of the largest dams in this study is estimated at approximately 400 million DH. It is roughly 40 percent of annual budget of the Hydraulic Sector. Table XIX2.3 and XIX2.4 show that the Ministry has several experience in construction of large scale dams with the bilateral and

multilateral financial assistances. Therefore, the Ministry has enough capability to handle such a large scale project with external financing schemes.

XIX2.2 Ministry of Agriculture, Rural Development, and Maritime Fishery

Annual investment budget of the Ministry of Agriculture, Rural Development, and Maritime Fishery was approximately 2.1 billion DH during four fiscal years from 1996/97 to 1999/2000. Summary of the investment budget is as shown in Table XIX2.2. Direction of Education, Research, and Development, who has overall responsibility for extension related activities, has an annual budget of 42 million DH. Meanwhile, Regional Offices for Agricultural Development (ORMVA), who are in charge of development of irrigation infrastructure, promotion and improvement of livestock and crop practices, have an annual budget of approximately one billion DH every year.

The total irrigation development cost of the four priority projects is estimated at 0.5 billion Dirhams in four years. Determined from the annual budget of ORMVA, the cost will not become a heavy burden if a soft loan of bilatelal or international financial arency is available.

XIX3 Cost Bearing

XIX3.1 Capital

(1) Dams

In the case of large-scale water resources development (GH), 60 % of the capital is born by the Government according to the Code of Agricultural Investment (CIA). The remaining 40 % is born by beneficial farmers. However, the law exempts the farmers who have less than 5 ha from the charges for capital cost. As a matter of course, the capital to be born by farmers is the separated cost for irrigation purposes in the case of multipurpose dams.

In the case of small and medium scale water resources development (PMH), normaly the capital expenditure is born by the Government since target areas are less developed in most cases. There are some cases that communes and villages bear capital cost of small-scale dams.

(2) Irrigation Facilities

Just as is the case with the dams, 60 % of the capital for irrigation development is born by the Government in the case of GH. The remaining 40 % is born by beneficial farmers according to the size of farmlands. Payment shall be made by the following two ways:

- One time payment just after completion of the construction, or
- Installement plan of payment period of 21 years (including 4 years of grace period) and 4% of interest rate.

In the case of PMH, the cost bearing of farmers is decided by negotiation, since the project sites are less developed in most cases. Normally the cost born by the farmers are at most 10 % of the capital expenditure. It means most of the irrigation development cost is born by the Government in the case of PMH.

XIX3.2 Operation and Maintenance Cost

(1) Dams

Operation and maintenance (O & M) of dams are carried out by the Ministry of Equipment and the costs for O & M are allocated by the ministry from its own budget.

(2) Irrigation Facilities

Beneficial farmers have to bear 100 % of O & M cost and cost recovery for O & M for irrigation facilities as water charge in both the cases of GH and PMH. The charge is collected through ORMVA in the case of GH and through agricultural water users associations (AUEA) in the case of PMH. Tarif of the charge is fixed by the Government in GH and by AUEA in PMH.

In the case of GH, water charge will be collected from farmers by agricultural water users associations. Then the charge will be pay to ORMVA and it will be used for operatrion and maintenance of irrigation facilities. A part of the water charge will be paid from ORMVA to the eight basin agencies to be established (the first basin agency in Oum Er Rbia river basin has alreay been active). Flow chart of water charge is shown in Figure XIX3.1.

In Morocco, water charge for irrigation has not been properly collected up to now except some areas. According to information from the Ministry of Agriculture, there is an good example of water charge collecting system in Loukkos, Northern part of Morocco. In order to measure water volume used by each farmer equitably, individual water counters were installed. Though the initial investment for the facility was large, collection of water charge is running well and the facility cost will be recoverd in several years. In detailed design stage of this project, it is advisable to reffer the system in Loukkos.

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Table XIX2.1 Investment Budget of Ministry of Equipment
(from the fiscal years 1996/1997 to 1999/2000)

Unit: Dirham

		1996/1997	1997/1998	1998/1999	1999/2000
00	**General Administration**	**29,000,000**	**48,200,000**	**11,815,000**	**21,060,000**
20	**General**	**14,000,000**	**17,600,000**	**10,363,170**	**11,085,500**
24	Direction of Personnel Affairs and Formation	5,000,000	5,600,000	3,037,500	5,680,500
25	Hassania School of the Public Works	9,000,000	12,000,000	7,325,670	5,405,000
30	**Road Sector**	**880,000,000**	**891,000,000**	**862,433,330**	**847,110,000**
31	Direction of Roads and the Road Traffic	880,000,000	891,000,000	862,433,330	847,110,000
40	**Port Sector**	**412,000,000**	**340,710,000**	**380,620,000**	**405,919,500**
41	Direction of Ports and Maritime Public Domain	322,200,000	340,710,000	317,620,000	344,590,000
42	Direction of Ports of Casablanca and Mohammedia	89,800,000		63,000,000	61,329,500
50	**Hydraulic Sector**	**1,060,000,000**	**1,140,000,000**	**934,322,000**	**1,047,240,000**
51	General Directorate of Hydraulics	51,390,000		78,505,000	60,365,000
52	Direction of Research and Planning of Water	208,864,000		246,935,000	397,405,000
53	Direction of Hydraulic Planning	799,746,000	809,698,000	608,882,000	589,470,000
60	**Public Equipment Sector**	**26,000,000**	**21,290,000**	**16,606,500**	**15,275,000**
61	Direction of Public Equipment	26,000,000	21,290,000	16,606,500	15,275,000
80	**Meteorology Sector**	**37,000,000**	**41,200,000**	**33,840,000**	**32,310,000**
81	Direction of National Meteorology	37,000,000	41,200,000	33,840,000	32,310,000
	Total Investment Budget	**2,458,000,000**	**2,500,000,000**	**2,250,000,000**	**2,380,000,000**

Source: Budget D'Investissement Pour L'Annee Budget Aire 1996/1997, Ministere des Travaux Publics
Budget D'Investissement Pour 1997/1998, Ministere des Travaux Publics
Budget D'Investissement Pour 1998/1999, Ministere de L'Equipement
Budget D'Investissement Pour 1999/2000, Ministere de L'Equipement

Table XIX2.2 Investment Budget of Ministry of Agriculture, Rural Development, and Maritime Fishery
(from the fiscal years 1996/1997 to 1999/2000)

Unit: Dirham

		1996/1997	1997/1998	1998/1999	1999/2000
20	**Directions for Administrative Character**	**51,464,200**	**40,900,000**	**28,067,500**	**28,362,500**
21	Direction of Administrative and Legal Affairs	42,466,200	32,400,000	21,377,500	19,427,500
22	Direction of Human Resources	8,998,000	8,500,000	6,690,000	8,935,000
30	**Direction of Programming and Economic Affairs**	**65,883,800**	**22,237,000**	**21,859,000**	**20,126,000**
40	**Technical Directions**	**503,167,000**	**587,044,200**	**329,611,600**	**375,554,400**
42	Administration of Water, Forest, and Soil Conservation	161,750,000	194,936,000	0	0
43	Direction of Protection of Plants, Technical Control, and Repression of Fraud	40,705,000	44,881,000	43,056,000	41,122,000
45	Direction of Plant Production	177,352,000	201,627,000	153,170,000	144,343,000
46	Direction of Livestock Farming	115,730,000	139,000,200	125,929,600	182,991,400
47	Direction of Agricultural Public Corporation and Professional Association	7,630,000	6,600,000	7,456,000	7,098,000
50	**Direction of Education, Research, and Development**	**41,783,000**	**42,200,000**	**35,445,789**	**42,105,380**
60	**Public Establishments of Formation and Research**	**67,000,000**	**76,500,000**	**72,000,000**	**110,692,000**
61	Hassan II Agronomic and Veterinary Institute	11,000,000	10,000,000	13,000,000	21,850,000
62	Meknes Agriculture National School	5,000,000	5,500,000	8,000,000	12,746,000
63	Prince Sidi Mohamed a Sidi Moussa Ben Ali Technical Institute	1,000,000	1,000,000	1,000,000	2,000,000
64	National institute of Agronomic Research	50,000,000	60,000,000	50,000,000	74,096,000
65	Official Laboratory of Analysis and Chemical Research	0	0	0	
70	**Rural Civil Engineering**	**330,778,000**	**323,561,085**	**325,516,971**	**412,649,910**
71	Administration of Rural Civil Engineering	23,502,600	25,325,000	21,470,000	19,946,000
72	Direction of Development and Management of Irrigation	54,059,500	38,531,785	44,210,217	43,572,500
73	Direction of Hydro-Agricultural Development	232,785,900	220,081,300	229,093,450	244,382,010
74	Direction of Land Development	20,430,000	39,623,000	30,743,304	104,749,400
80	**Regional Offices for Agricultural Security (ORMVA)**	**939,924,000**	**1,107,557,715**	**998,499,140**	**1,026,644,810**
90	**Administration of Land Conservation, Land Register, and Cartography**			**113,000,000**	**107,000,000**
91	General Administration			36,570,000	33,299,700
92	Direction of Land Register and Cartography			65,870,000	62,484,300
93	Direction of Land Conservation			10,560,000	11,216,000
	Total Investment Budget	**2,000,000,000**	**2,200,000,000**	**1,924,000,000**	**2,123,135,000**

Source: Budget D'Investissement Pour L'Annee Budget Aire 1996/1997, Ministere de L'Agriculture et de la Mise en Valeur Agricole
Budget D'Investissement Pour 1997/1998, Ministere de L'Agriculture et de la Mise en Valeur Agricole
Budget D'Investissement, Annee Budgetaire 1998-1999, Ministere de L'Agriculture, du Developpement Rural et des Peches
Budget D'Investissement, Annee Budgetaire 1999-2000, Ministere de L'Agriculture, du Developpement Rural et des Peches

Table XIX2.3 List of Large Dams Constructed, under Construction, and to be Constructed with External Financial Assistance (Since 1990)

Name of Dam	Construction Period	Construction Cost (million DH)	External Loan (million DH)	Source of Finance
9 Avril 1947	1991 - 1995	496.1	359.3	BAD - BID - OPEC
Al Wahda	1990 - 1998	6,100.0	5,269.8	FADES-Italy-Spain-Russia-FKDEA
Sidi Chahed	1993 - 1997	424.9	358.6	FADES
Hassan II	1995 - 1998	678.6	587.2	FKDEA - BID
Complexe Dchar El Oued Ait Messaoud	1997 - 2001	923.8	810.4	FKDEA - FADES - BID
Ait Hammou	1999 - 2002	438.5	350.8	FADES - BID
Sidi Said	2001 - 2003	760.0	570.0	FKDEA
Raouz	2001 - 2004	510.0	-	
Complexe Sidi Mohamed Ben Abdellah/Ouljet Benikhemiss	2002 -	900.0	approximately 80 % of construction cost	

Note: Construction Cost includes facility cost only.
BAD: African Development Bank
BID: Islamic Bank of Development
OPEC: Organization of Petroleum Exporting Countries
FADES: The Kuwaiti Fund
FKDEA: The Kuwaiti Fund of Economic Development

Table XIX2.4 Present Status of Water Resources Development Projects in Five-Year Development Plan of Ministry of Equipement (1999 / 2003)

Name of Dam	Location	Implementation Period	Project Cost (MDH)	External Finance (MDH)	Source of Finance	Observation
Bouhouda	Taounate	1995-98	127	0	-	Completed.
Complex Dcahr El Oued A¨t Messaoud	Beni Mellal	1997-2001	924	810.4	FKDEA - FADES - BID	Under implementation.
Aït Hammou	Agadir	1999-2002	439	17 MDK	FADES - BID (electromecanic)	Under implementation, 1 DK = 30 DH
Chakoukane (continuation)	Taroudant	2001-2002	32	(2)	FAD	Total project cost = 330 MDH
Adarouch	Ifrane	2003-2006	186	(2)	FAD	
Sidi Saïd	Khénifra	2001-2003	760	20 MDK	FKDEA	
Raouz	Tetouan	2001-2004	510	-	-	Searching for finance
(SMBA + Beni Khemiss) complex (1)	Rabat	2001-2004	900	-	-	Searching for finance
Wigrane	Marrakech	2002-2004	650	-	-	Searching for finance
Imizer	Haouz	2001-2004	-	-	-	Searching for finance
Aït M'zal	Chtouka	2001-2003	183	0	-	
Igouzoulane	Essaouira	2001-2003	395	0	-	
Iffassiyene (5)	Al Hoceima	OP :2007	1,100	-	-	Too expensive
Emsa	Tetouan	OP : 2010	-	-	-	
Safi canal	Safi	-	-	-	-	
Ouljet Soltane	Khemisset	OP	-	-	-	
Zerrar	Essaouira	OP	700	-	-	
Bousfoul	Taounate	OP	-	-	-	
Assayad	Guelmim	OP	782	-	-	
Mechraa lahjar	Sidi Kacem	OP	-	-	-	
Aïn kwachia	Ben Slimane	OP	90	-	-	
Touizgui Ramz	Guelmim	OP	93	-	-	
Boulaouane	Chichaoua	OP	182	-	-	
M'dez-Aïn Timedrine	Sefrou	OP	1,400	-	-	

Note: FKDEA: The Kuwaiti Fund of Economic Development
FADES: The Kuwaiti Fund
BID: Islamic Bank of Development
FAD: French Agency for Development
Calculation of Loan Amount = ((GC+EM+Et)/1.14)*0.0
OP means Out of Plan or postponed
(1): SMBA + Beni Khemiss : Sidi Mohammed Ben Abdella surelevation & Beni Khemiss dam complex
(2): Loan for Adarouch, Chakoukane & Bab Louta : 250 MDH

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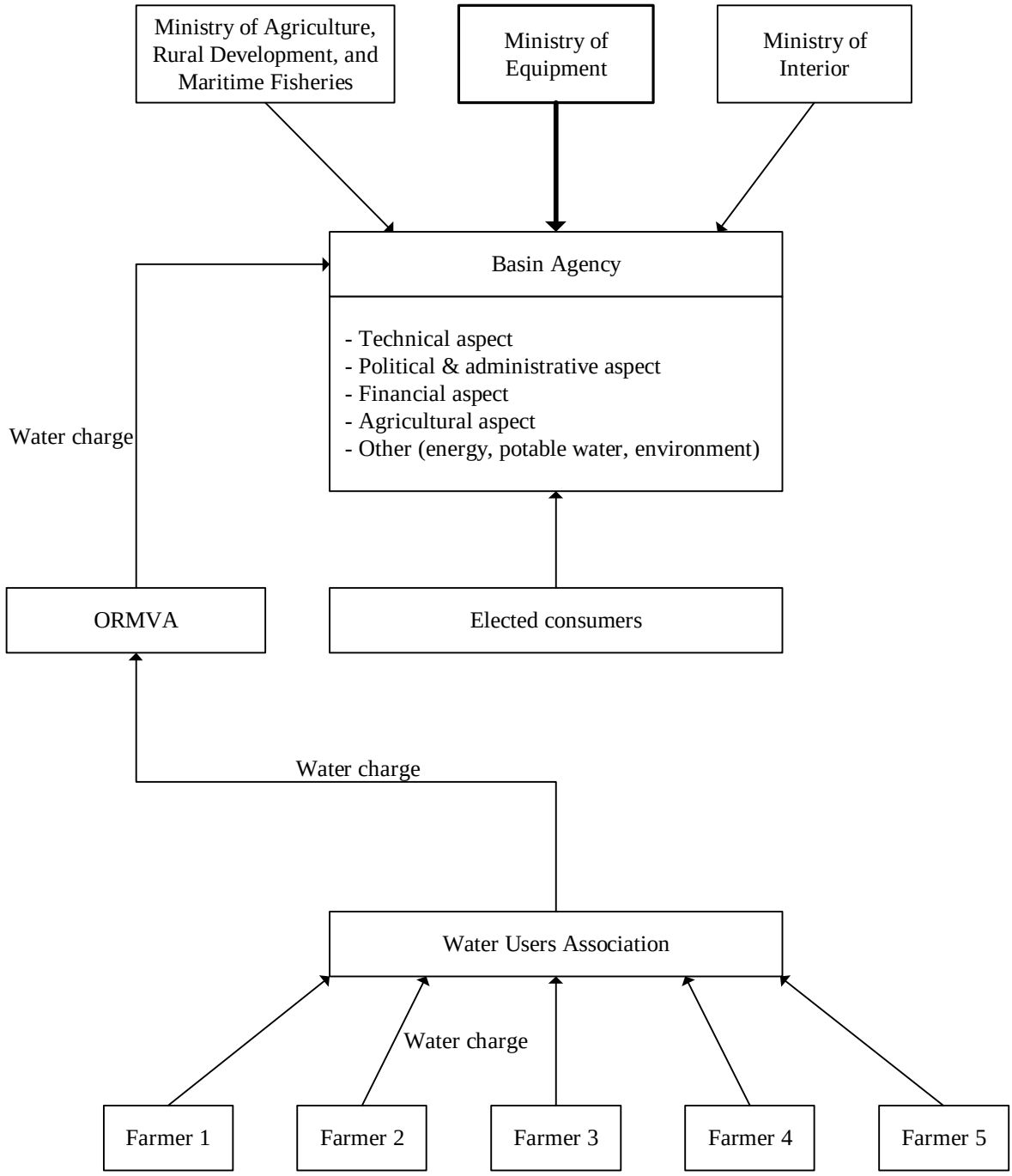

FEASIBILITY STUDY ON WATER RESOURCES DEVELOPMENT IN RURAL AREA JAPAN INTERNATIONAL COOPERATION AGENCY	**Figure XIX3.1** **Flow of Water Charge to be collected from Beneficial Farmers**