

ANNEX-I
*Implementation Plan, Cost Estimate
and Project Evaluation*

**THE STUDY ON DIVERSIFIED AGRICULTURE FOR ENHANCED FARM INCOME
IN THE STATE OF HIMACHAL PRADESH**

FINAL REPORT

**ANNEX-I
IMPLEMENTATION PLAN, COST ESTIMATE
AND PROJECT EVALUATION**

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ANNEX-I IMPLEMENTATION PLAN, COST ESTIMATE AND PROJECT EVALUATION

I-1 Implementation Plan

I-1.1 Implementation Organization

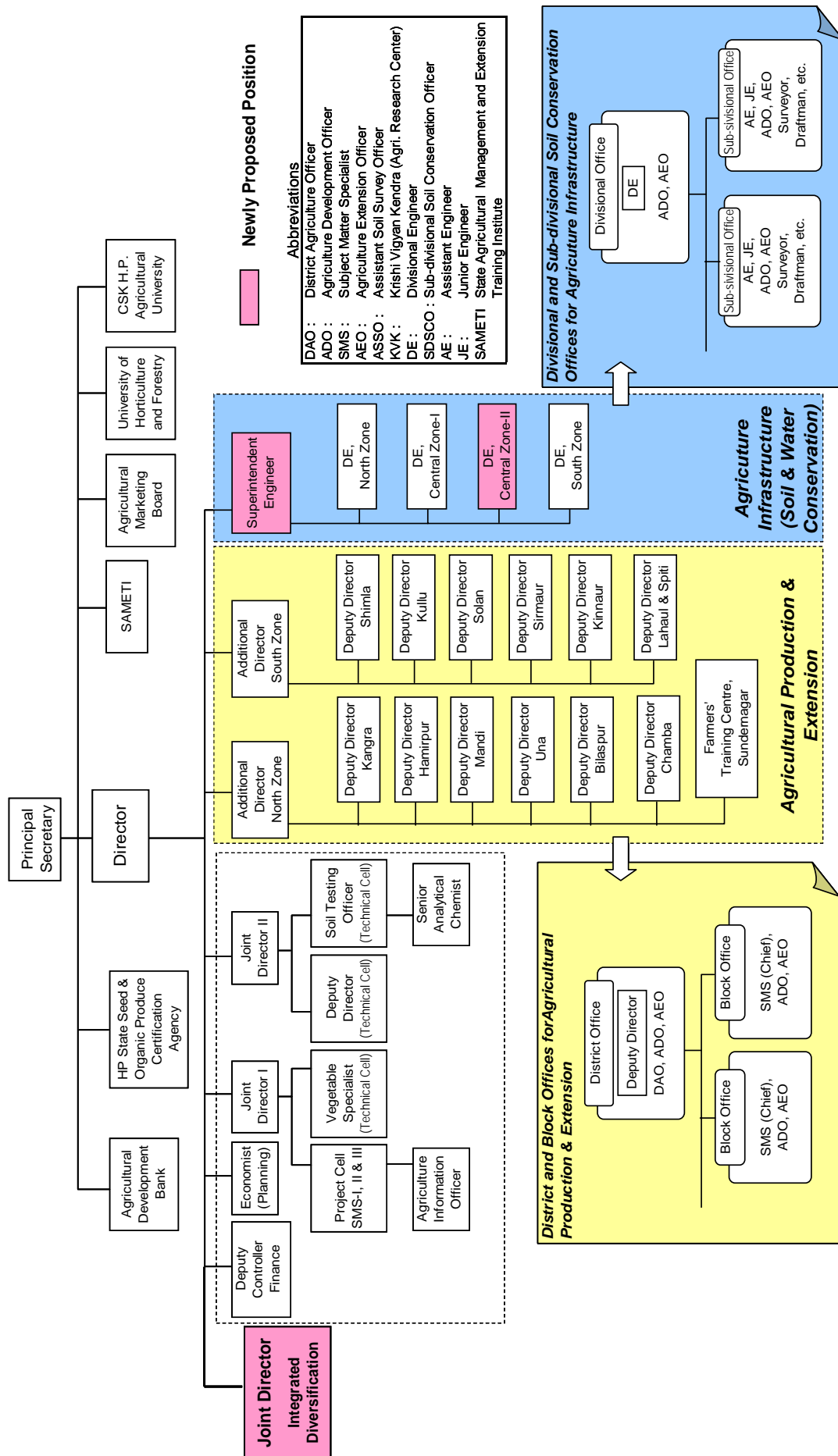
Department of Agriculture (DOA) is the executing agency for the overall program implementation for the proposed crop diversification and is responsible for implementation of all the plans except the Market System Improvement plan in the proposed programs. Market Board is responsible for implementation of the Market System Improvement plan in collaboration with DOA in principal. Proposed responsibilities of respective key persons for the program implementation are given below:

Table I-1.1 Proposed Responsibilities and Key Persons

Item	Organization or Person	Responsibility
Executing Agency	Department of Agriculture	Overall program implementation
Responsible person for the overall execution	Director of Agriculture	Overall execution of the programs
Partly responsible person	Managing Director of Agriculture Marketing Board	Execution of Market System Improvement program component excluding construction of collection centers
Partly Responsible person	Joint Director I (Vegetable Specialist)	Coordination in DOA and technology for Vegetable Cultivation & promotion
Partly Responsible person	Additional Director North Zone	Extension Activities in North zone
Partly Responsible person	Additional Director South Zone	Extension Activities in South zone
Partly Responsible person	Superintendent Engineer	Execution of Infrastructure Development program

Source: Result of the discussion between DOA and JICA Study Team on the implementation organization, 2008.

In order to implement the Infrastructure Development Program covering construction of (1) 10,700 ha of minor irrigation, (2) 3,300 ha of life saving facilities, (3) 890 km of access farm roads and (4) 12 collection centers, it is proposed to set up a new additional zone office in the Central Zone and appoint the Superintendent Engineer responsible for executing the Programs for construction. The proposed organization chart is shown in the Fig. I-1.1 in the next page.



Newly Proposed Position

Abbreviations

DAO : District Agriculture Officer
 ADO : Agriculture Development Officer
 SMS : Subject Matter Specialist
 AEO : Agriculture Extension Officer
 ASSO : Assistant Soil Survey Officer
 KVK : Krishi Vigyan Kendra (Agri. Research Center)
 DE : Divisional Engineer
 SDSCO : Sub-divisional Soil Conservation Officer
 AE : Assistant Engineer
 JE : Junior Engineer
 SAMETI : State Agricultural Management and Extension Training Institute

Fig. I-1.1 Proposed Organization for Program Implementation

I-1.2 Implementation Time Schedule

Implementation schedule for the Action Plan is proposed to cover the period by the year of 2017/18, as given in Fig. I-1.2. In implementation of the Farmers' Support Program and Infrastructure Development Program, different scheduling of the Program Components is proposed for each of the Category-I, II, III and IV depending on the present progress of agricultural diversification, as follows;

- **Category-I (Advanced area for diversification)**

Firstly, the Components for Vegetable Promotion and Post-harvest Processing Promotion will be conducted, since the crop diversification in this category has already started and farmers produce and send vegetables to markets. Additional infrastructure will be provided where diversification potential with irrigation is confirmed or access farm roads for transport of diversified crops are required. Food productivity will be improved with irrigation.

- **Category-II (Area where diversification just started)**

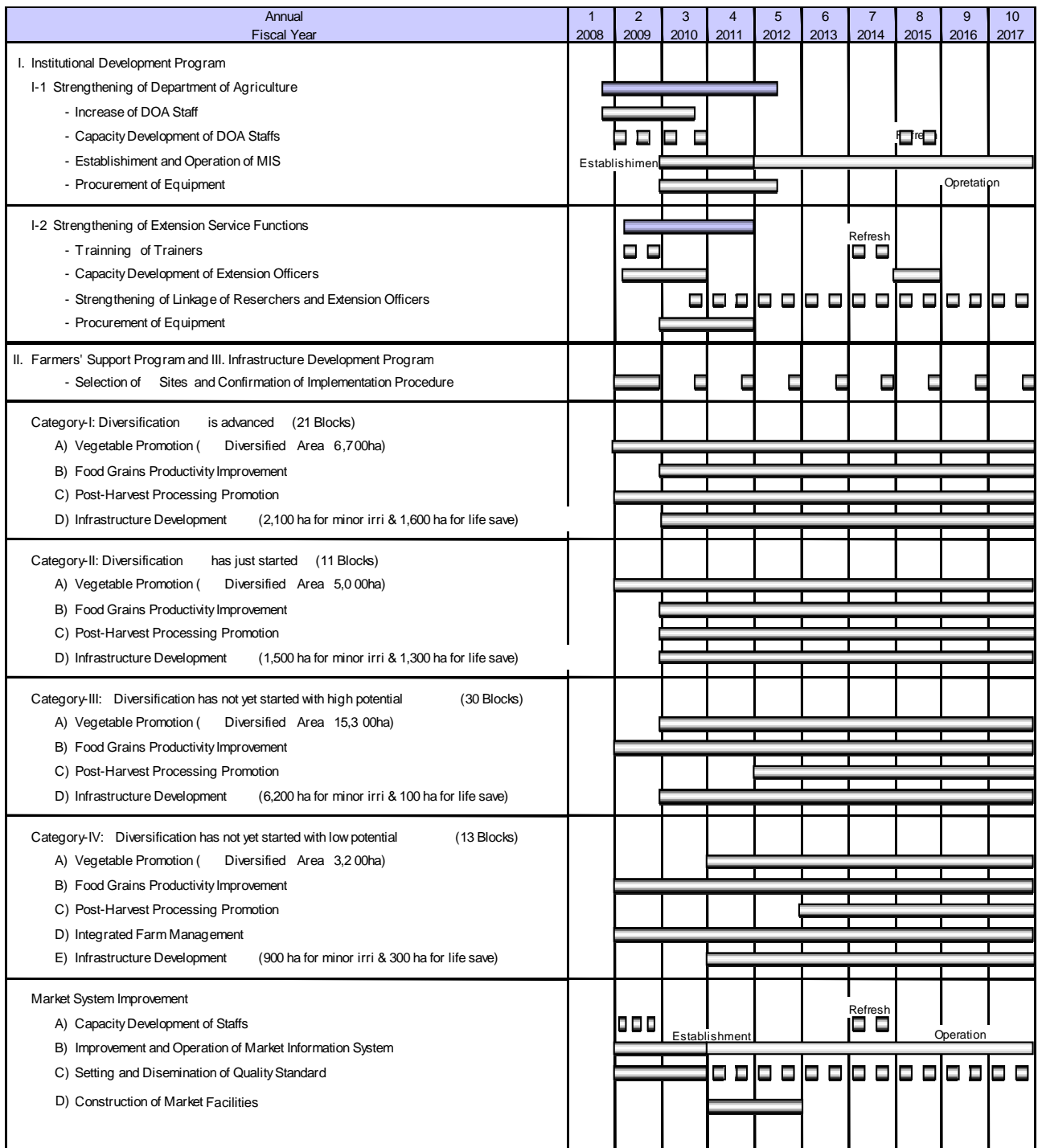
The Components for Vegetable Promotion will be firstly conducted, then followed by the Components of Food Grains Productivity Improvement, Post-harvest Processing and Infrastructure Development, since the crop diversification has just started and vegetable area expansion is an urgent need.

- **Category-III (Potential diversification area where diversification has not started)**

Food grain productivity improvement will be promoted at first and followed by vegetable promotion and infrastructure development since the crop diversification in this category can not start without improvement of food grain productivity. Post-harvest processing is scheduled to be promoted two years after vegetable promotion.

- **Category-IV (Area not covered in the above)**

Food grain productivity improvement and integrated farm management will be promoted at first and followed by vegetable promotion and infrastructure development since the crop diversification in this category can not start without improvement of food grain productivity. Post-harvest processing is scheduled to be promoted two years after vegetable promotion.



Source: Prepared by the JICA Study Team.

Fig. I-1.2 Proposed Implementation Schedule

I-2 Preliminary Cost Estimate for Action Plan

The cost for the Action Plan is estimated at the preliminary level based on the sample study results at pre-feasibility level as well as the past expenditure of DOA, with the following conditions and assumptions:

- i) The exchange rates among Indian Rupee, US \$ and Japanese Yen is assumed at US\$1.00 = Rs.43.73 = Japanese ¥109.33 (Rs.1.0 = Japanese ¥2.50)
- ii) The construction works for minor and life saving irrigation will be executed on community contract basis with DOA's support in survey, design and construction. On the other hand, the construction works for access farm roads and the building works for collection centers and market yards will be executed on contract basis.
- iii) All the costs are estimated based on the current prices in September 2008.
- iv) Administration cost of DOA in the estimate is assumed at 5% of the eligible portion, and other cost including administration cost for the marketing board and ATMA and maintenance cost of market yards are preliminary estimated.
- v) Physical contingency in the cost estimate is assumed at 10% of the base cost, and price contingencies are computed by applying 2.6% per annum for foreign portion and 4.8% per annum for the national portion.

The cost for the action plan consists of (1) direct cost for procurement and works, (2) consulting services to support the implementation agency, (3) such other costs for administration and taxes, in which land acquisition cost is not required.

The cost for the procurement and works is estimated based on the activities required to achieve the target in each Component of the Programs. Detailed cost estimate is described in Annexes for each of Programs and Components. The consulting services are assumed to provide technical support and management assistance to the implementation agency.

The preliminarily estimated cost is Rs.9,435 million in total consisting of Rs.295 million for the foreign currency portion and Rs.9,140 million for the national currency portion, as summarized in Table I-2.1, and the disbursement schedule is shown in Attachment I-1 for the Institutional Development Program and Farmers' Support Program as well as Attachment I-2 for the overall Action Plan:

Table I-2.1 Summary of Preliminarily Estimated Cost

Item	FC Portion (J¥. million)	LC Portion (Rs. million)	Equivalent (Rs. million)	Total Amount (J¥ million)
1. Procurement and Works				
1.1 Institutional Development				
(1) Strengthening of Department of Agriculture	0.0	309.4	309.4	774
(2) Strengthening of Extension Service Function	0.0	247.1	247.1	618
(Sub-total of 1.1)	0.0	556.5	556.5	1,392
1.2 Farmers' Support				
(1) Vegetable Promotion	0.0	522.5	522.5	1,306
(2) Food Grain Productivity Improvement	0.0	128.1	128.1	320
(3) Integrated Farm Management	0.0	78.6	78.6	197
(4) Post Harvest Processing Promotion	0.0	2.2	2.2	6
(5) Marketing System Improvement	0.0	130.3	130.3	326
(Sub-total of 1.2)	0.0	861.7	861.7	2,155
1.3 Infrastructure Development Program				
(1) Infrastructure Development/Improvement	0.0	3,757.0	3,757.0	9,393
(2) Infrastructure Development Support	0.0	175.0	175.0	438
(Sub-total of 1.3)	0.0	3,932.0	3,932.0	9,831
Total of 1.1 + 1.2 + 1.3	0.0	5,350.2	5,350.2	13,378
1.4 Price escalation	0.0	1,432.8	1,432.8	3,582
1.5 Physical contingency	0.0	678.3	678.3	1,696
Total of Procurement and Works	0.0	7,461.3	7,461.3	18,653.6
2. Engineering services				
(1) International Project Consultants	598.4	140.3	379.7	949
(2) Price escalation	72.6	33.1	62.1	155
(3) Physical contingency	67.1	17.3	44.2	110
Sub-total of 2.	738.1	190.7	485.9	1,214
Total of 1+2	738.1	7,652.0	7,947.2	19,870
3. Administration and Other Cost				
(1) Administration cost	0.0	397.3	397.3	993
(2) DOA Preparatory works	0.0	295.7	295.7	739
(3) Tax & Duty	0.0	794.7	794.7	1,987
Total of 3.	0.0	1,487.7	1,487.7	3,719
Grand Total (1 + 2 + 3)	738.1	9,139.7	9,434.9	23,509

Note; FC: foreign currency portion, LC: national currency portion

I-3 Project Evaluation

I-3.1 General

Purpose of the economic evaluation is to assess economic feasibility of the overall Action Plan, and is carried out in terms of the economic internal rate of return (EIRR), the cost-benefit ratio (B/C), and the net present value (B-C), based on the following assumption:

- i) Economic life of the project is assumed to be 30 years beginning from year 2009.
- ii) For the calculation of EIRR, only direct benefit are counted, and no indirect and intangible benefits are taken into account.
- iii) The same rate as in the cost estimate is applied as of September 2008.
- iv) Transfer payment such as tax, subsidy and interest rate are excluded from the economic project cost, and the standard conversion factor is applied to estimate economic price.
- v) Discount rate is set as 12% for calculation of B/C and B-C.

I-3.2 Key Assumption of With and Without Project Condition

The present cultivable land is 730,400 ha in the State. Out of this area, 468,600 ha are utilized for such annual crops as food grains and vegetables, and the remaining 261,800 ha are fruits trees and the current fallow land. Fruit trees are generally under rainfed condition, and irrigated and life saving irrigation are mostly located in the annual crops area.

Presently, the area under irrigation and life saving irrigation is 113,100 ha as the result of continuous efforts by IPH and DOA with annual expansion of about 3,000 ha per annum since several years ago. IPH and DOA likely continue this effort under the without project condition, and 30,000 ha of irrigation area will expand during the Action Plan period till 2018/18. Under the with project condition, 157,100 ha will be irrigated by irrigation and life saving by the Infrastructure Development Program, as summarized below:

Table I-3.1 Change in Irrigation Condition in the Action Plan Period

Cultivable Land Condition	Present (2007/08)	Without Project Condition (2017/18)	With Project Condition (2017/18)
Food Grains and Vegetables			
- Rainfed	355,500 ha	325,500 ha (-30,000 ha)	312,800 ha (-12,700 ha)
- Life Saving Irrigation	12,400 ha	12,400 ha (0 ha)	15,700 ha (+3,300 ha)
- Irrigation	100,700 ha	130,700 ha (+30,000 ha)	141,400 ha (+10,700 ha)
- Total for vegetables and grains	468,600 ha	468,600 ha (0 ha)	468,600 ha (0 ha)
Orchard (Fruits Trees)	192,000 ha	192,000 ha (0 ha)	192,000 ha (0 ha)
Current Fallow	69,800 ha	69,800 ha (0 ha)	69,800 ha (0 ha)
Total Cultivable Land	730,400 ha	730,400 ha (0 ha)	730,400 ha (0 ha)

Note: Life saving irrigation is effective for supplemental use in Kharif season. Orchard and current fallow is under rainfed condition.

Source: Estimation and projection by the JICA Study Team based on the Action Plan (referred to Annex H: Infrastructure).

Taking the above condition into account, the future cropping pattern is assumed for the without and with project conditions in the Action Plan period, as shown below.

Table I-3.2 Cropping Area under the Future Conditions

		Kharif			Rabi		
		Food Grain	Vegetables	Total	Food Grain	Vegetables	Total
Present Condition	Rainfed	343,100 ha	12,400 ha	355,500 ha	330,300 ha	0 ha	330,300 ha
	Life Saving	0 ha	12,400 ha	12,400 ha	0 ha	0 ha	0 ha
	Irrigation	76,600 ha	24,100 ha	100,700 ha	76,600 ha	24,100 ha	100,700 ha
	Total	419,700 ha	48,900 ha	468,600 ha	406,900 ha	24,100 ha	431,000 ha
Without Project Condition	Rainfed	313,100 ha	12,400 ha	325,500 ha	330,300 ha	0 ha	330,300 ha
	Life Saving	0 ha	12,400 ha	12,400 ha	0 ha	0 ha	0 ha
	Irrigation	105,600 ha	25,100 ha	130,700 ha	105,600 ha	25,100 ha	130,700 ha
	Total	418,700 ha	49,900 ha	468,600 ha	393,400 ha	25,100 ha	461,000 ha
With Project Condition	Rainfed	298,400 ha	14,400 ha	312,800 ha	327,200 ha	0 ha	327,200 ha
	Life Saving	0 ha	15,700 ha	15,700 ha	0 ha	0 ha	0 ha
	Irrigation	95,000 ha	45,100 ha	149,100 ha	113,400 ha	28,000 ha	141,400 ha
	Total	393,400 ha	75,200 ha	468,600 ha	440,600 ha	28,000 ha	468,600 ha

Source: Estimation and projection by the JICA Study Team based on the Action Plan (referred to Annex B: Agriculture, Annex F: Marketing).

Under the without project condition, the area under food grains would be maintained to sustain the food security of the State, and food grains production will increase not by unit yield increase but through expansion of irrigation area (30,000 ha) by the on-going programs. In this case, no additional land will be available for crop diversification and vegetable production will remain at the present level.

In order to promote the crop diversification, the Programs and Components will be implemented under the Action Plan. Under the Action Plan, unit yield of food grains will increase by improved farming, and this enables to decrease the food grain area while maintaining the food security of the State and to diversify the decreased area to the vegetable area. As a result, vegetable cultivation area will increase 30,200 ha in total, consisting of 26,300 ha in Kharif season and 2,900 ha in Rabi season.

Unit yield of crops are also estimated based on the information and data on the present and potential yields, as summarized below:

Table I-3.3 Unit Yield of Crops under the Future Conditions

	Rainfed	Life Saving	Irrigated	Rainfed	Life Saving	Irrigated
Maize	1.8 ton/ha	-	3.6 ton/ha	1.8 ton/ha	-	4.0 ton/ha
Paddy	1.6 ton/ha	-	3.0 ton/ha	1.6 ton/ha	-	3.5 ton/ha
Wheat	1.5 ton/ha	-	2.7 ton/ha	1.5 ton/ha	-	3.0 ton/ha
Tomatoes	18.0 ton/ha	24.0 ton/ha	30.0 ton/ha	25.1 ton/ha	28.3 ton/ha	31.4 ton/ha
Potatoes	6.9 ton/ha	9.2 ton/ha	11.5 ton/ha	11.8 ton/ha	13.2 ton/ha	14.7 ton/ha
Peas	6.2 ton/ha	8.3 ton/ha	10.4 ton/ha	8.3 ton/ha	9.4 ton/ha	10.4ton/ha
Cauliflower	9.5 ton/ha	12.7 ton/ha	15.9 ton/ha	9.9 ton/ha	13.2 ton/ha	16.5 ton/ha

Source: Attachment I-4, estimation by the JICA Study Team through adjustment and modification of available data and information (referred to Annex B: Agriculture and Annex E: Marketing).

I-3.3 Project Benefit

The economic benefit is estimated as the increment of net production value of crops between future “with” and “without” project conditions. The crop diversification benefit is accrued from i) conversion of cropping pattern from food grains to vegetables and ii) increase of crop productivity, especially for food grains.

The economic benefit is estimated based on the following assumptions,

- i) In estimation of net production value, vegetables are represented by the strategic vegetables of tomato, potato, peas and cauliflower, in order to avoid confusion by using many kind of vegetables.
- ii) Crop diversification is assumed to progress according to the implementation schedule of the Programs and Component, particularly the Farmers' Support Program and Infrastructure Development Program. Increase of unit yield and other associated effect like sales of vegetables in each site will partially appear in the next year, and reach to the full benefit in 3rd year. Accordingly, total full benefit will be attained in 12th year after implementation.

For estimation of the project benefit, crop budgets in the financial terms are prepared for the major crops both for without and with project conditions, based on the information available information with modification. Vegetable prices are fluctuating Then, economic crop budgets are calculated by applying the economic prices. Crop budgets are shown in Attachment I-3 for financial and Attachment I-4 for economic terms, as summarized below:

Table I-3.4 Summary of Economic Crop Budget for Food Grains

(Rs./ha)

		Without Project Condition			With Project Condition		
		Rainfed	Life Saving	Irrigated	Rainfed	Life Saving	Irrigated
Maize	Gross Income	10,300	-	20,500	10,300	-	22,800
	Production Cost	10,200	-	17,000	10,200	-	18,600
	Net Income	100	-	3,500	100	-	4,200
Paddy	Gross Income	12,200	-	22,800	12,200	-	26,600
	Production Cost	11,800	-	17,900	11,800	-	20,200
	Net Income	400	-	4,900	400	-	6,400
Wheat	Gross Income	12,900	-	23,200	12,900	-	25,800
	Production Cost	12,400	-	17,000	12,400	-	18,200
	Net Income	500	-	6,200	500	-	7,600

Source: Attachment I-4, estimation by the JICA Study Team through adjustment and modification of available data and information.

Table I-3.5 Summary of Economic Crop Budget for Vegetables

(Rs./ha)

		Without Project Condition			With Project Condition		
		Rainfed	Life Saving	Irrigated	Rainfed	Life Saving	Irrigated
Tomato	Gross Income	68,400	91,200	114,000	95,400	107,500	119,300
	Production Cost	57,900	78,000	92,900	77,800	87,600	96,800
	Net Income	10,500	13,200	21,100	17,600	19,900	22,500
Potato	Gross Income	33,100	44,200	55,200	56,600	63,400	70,600
	Production Cost	27,300	36,200	45,500	43,700	48,800	55,600
	Net Income	5,800	8,000	9,700	12,900	14,600	15,000
Peas	Gross Income	53,300	71,400	89,400	71,400	80,800	89,400
	Production Cost	39,200	51,400	64,100	49,400	56,700	63,900
	Net Income	14,100	19,800	25,300	22,000	24,100	25,500
Cauliflower	Gross Income	63,700	85,100	106,500	66,300	88,400	110,600
	Production Cost	47,100	60,400	74,800	47,300	62,800	78,500
	Net Income	17,600	24,700	31,700	19,000	25,600	32,100

Source: Attachment I-4, estimation by the JICA Study Team through adjustment and modification of available data and information.

Based on the economic crop budgets and future cropping area, the net production value at the full development stage is estimated at Rs.2,593.5 million under the without project condition and Rs.3,794.7 million under the with project condition (refer to Attachment I-5). Accordingly, the project benefit is Rs.1,201.2 million as the net incremental production value, as shown below.

Table I-3.6 Estimated Overall Project Benefit

	Net Production Value		
	Food Grains	Vegetables	Total
(1) Without Project Condition	Rs.1,271.6 million	Rs.1,321.9 million	Rs.2,593.5 million
(2) With Project Condition	Rs.1,517.1 million	Rs.2,277.6 million	Rs.3,794.7 million
(3) Increment from (1) to (2)	Rs.245.5 million	Rs.955.7 million	Rs.1,201.2 million

Source: Estimation by the JICA Study Team based on Tables and Attachments in this Section.

I-3.4 Project Cost

Based on the financial project cost estimated in Table I-2.1 of the Section I-2 Preliminary Cost Estimate for Action Plan, the economic project cost is estimate at Rs.5,988 million as shown in Attachment I-6. Operation and maintenance cost for farm road is estimated totally Rs.1,201 million per annum after completion of construction, however, irrigation O&M cost is included in the crop budgets. Irrigation pump will be replaced after 20 years of installation and its cost is envisaged at Rs.1,889 million in total. Disbursement of the project cost is shown in Attachment I-7 and the economic project cost is summarized in the table below:

Table I-3.7 Economic Project Cost

(unit: Rs. Million)

Description	Financial Cost	Economic Cost
1. Institutional Development		
1.1 Institutional Development	557	529
1.2 Farmers' Support	862	819
1.3 Infrastructure Development	3,932	3,736
Sub-Total 1.1 to 1.3	5,350 56.7%	5,083 84.9%
1.4 Price Escalation	1,433	0
1.5 Physical Contingency	678	508
Sub-Total 1.1 to 1.5	7,461 79.1%	5,591 93.4%
2. Consulting Services	486 5.2%	397 6.6%
Sub-Total 1 to 2	7,947 84.2%	5,988 100.0%
3. Administration and Other Cost		
3.1 Administration Cost	397	0
3.2 Other Cost	296	0
3.3 Tax and Duty	795	0
Sub-Total 3	1,488 15.8%	0 0.0%
Grand Total	9,435 100.0%	5,988 100.0%

Source: Estimation by the JICA Study Team (referred to Attachment I-6).

I-3.5 Evaluation Results

Based on flow of the economic cost and benefits presented in Attachment I-8, EIRR is calculated at 13.5% with Rs.463 million of B-C and 1.11 of B/C, as summarized below;

Table I-3.8 Economic Benefit of the Project

EIRR (%)	Net Present Value (12% discount rate)			B/C
	Benefit (Rs. million)	Cost (Rs. million)	B-C (Rs. million)	
13.5%	4,062	4,525	463	1.11

Source: Estimation by the JICA Study Team (referred to Attachment I-7).

In addition a sensitivity analysis was carried out to evaluate the viability of the project against possible adverse change in the future, and the result is shown in the table below:

Table I-3.5 Result of Sensitivity Analysis

		Cost Increase		
		0%	+10%	+20%
Benefit Decrease	0%	13.5%	12.2%	11.0%
	-10%	12.0%	10.7%	9.6%
	-20%	10.4%	9.1%	8.0%

Source: Estimation by the JICA Study Team (referred to Attachment I-7).

Evaluation results indicate the followings:

- iii) Evaluation indicators of EIRR, B-C and B/C show the higher economic viability in the agricultural and rural development sector, and the crop diversification in the Action Plan is attractive to upgrade the agricultural production structure and rural livelihood in the State. However, this level of return may not allow investment from the private sector, therefore, investment is required by the public sector.
- iv) Since the project is aiming at crop diversification with keeping food security at farmers' and State level, the crop diversification under the Action Plan is feasible paying attentions on marginal and small farmers. Thus it can be said that the project also socially acceptable.
- v) Sensitivity analysis shows such adverse effects as 10% benefit decrease and 10% cost increase may not reduce the economic viability of the project. But the plan is sensitive to further decrease of benefit and increase of cost

Attachment I-2 Annual Disbursement Schedule

Item	Total			2009			2010			2011			2012			2013			2014			2015			2016			2017										
	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total											
1. Procurement /Works	0.0	7,461.3	18,693.4	0.0	560.6	1,401.5	0.0	831.1	1,577.8	0.0	596.3	1,498.1	0.0	902.2	2,265.4	0.0	1,211.5	3,028.7	0.0	1,289.5	3,173.7	0.0	1,032.8	2,561.9	0.0	769.1	1,922.7	0.0	485.4	1,213.5								
1. Institutional Development																																						
(1) Strengthening of Department of Agriculture	0.0	309.4	773.5	0.0	206.3	516.8	0.0	103.1	267.8																													
(2) Strengthening of Extension Service Function	0.0	247.1	617.8	0.0	184.7	411.8	0.0	82.4	206.0																													
2. Farmers' Support																																						
1) Production																																						
(1) Vegetable Promotion	0.0	522.5	1,306.3	0.0	41.5	103.8	0.0	55.7	139.3	0.0	54.9	137.3	0.0	59.2	148.0	0.0	61.7	154.3	0.0	61.7	154.3	0.0	61.7	154.3	0.0	61.7	154.3	0.0	61.7	154.3	0.0	64.4	161.1					
(2) Food Grain Productivity Improvement	0.0	128.1	320.3	0.0	2.9	5.8	0.0	12.9	32.3	0.0	11.8	29.0	0.0	16.0	40.0	0.0	16.9	42.3	0.0	16.9	42.3	0.0	16.9	42.3	0.0	16.9	42.3	0.0	16.9	42.3	0.0	17.7	44.3					
(3) Integrated Farm Management	0.0	78.6	196.5	0.0	1.5	3.8	0.0	4.2	10.5	0.0	7.5	18.8	0.0	10.3	25.8	0.0	10.9	27.3	0.0	10.9	27.3	0.0	10.9	27.3	0.0	10.9	27.3	0.0	10.9	27.3	0.0	11.5	28.8					
2) Marketing																																						
(1) Post Harvest Processing Promotion	0.0	2.2	5.5	0.0	0.7	1.8	0.0	0.7	1.8	0.0	0.7	1.8	0.0	0.1	0.3																							
(2) Marketing System Improvement	0.0	130.3	325.8	0.0	66.3	173.3	0.0	60.3	150.8	0.0	0.3	0.8	0.0	0.3	0.8	0.0	0.1	0.3																				
3. Infrastructure Development/Improvement																																						
(1) Infrastructure Development/Improvement	0.0	3,757.0	9,392.8																																			
(2) Infrastructure Development Support	0.0	175.0	437.5																																			
Base cost	0.0	5,350.2	13,375.8	0.0	486.3	1,215.8	0.0	522.4	1,308.0	0.0	473.3	1,183.3	0.0	673.9	1,699.8	0.0	871.2	2,178.0	0.0	871.1	2,177.8	0.0	871.1	2,177.8	0.0	871.1	2,177.8	0.0	871.1	2,177.8	0.0	871.1	2,177.8	0.0	871.1	2,177.8		
Price escalation	0.0	1,432.8	3,582.0	0.0	23.3	58.4	0.0	51.4	128.4	0.0	71.5	178.7	0.0	140.2	350.6	0.0	230.1	575.4	0.0	283.0	707.4	0.0	282.7	656.7	0.0	216.7	546.7	0.0	216.7	546.7	0.0	216.7	546.7	0.0	216.7	546.7		
Physical contingency	0.0	678.3	1,695.8	0.0	51.0	127.4	0.0	57.4	143.4	0.0	54.5	138.2	0.0	82.0	205.0	0.0	110.1	275.3	0.0	115.4	288.5	0.0	93.9	234.7	0.0	69.9	174.8	0.0	69.9	174.8	0.0	69.9	174.8	0.0	69.9	174.8		
2. Consulting services	738.1	160.7	1,214.8	33.8	8.1	54.0	138.6	33.9	223.0	106.8	26.8	173.0	109.4	27.9	178.0	112.3	29.3	185.0	78.8	20.4	128.0	78.8	21.4	132.0	40.4	11.2	68.0	41.5	11.8	71.0								
International Project Management Consultant	598.4	140.3	849.2	23.9	7.0	47.5	119.7	28.1	189.8	89.8	21.0	142.4	89.8	21.0	142.4	89.8	21.0	142.4	89.8	14.0	94.9	29.9	7.0	47.5	29.9	7.0	47.5	29.9	7.0	47.5	29.9	7.0	47.5	29.9	7.0	47.5		
Price escalation	72.6	33.1	155.2	0.8	0.3	1.6	6.3	2.8	13.2	7.2	3.2	15.1	9.7	4.3	20.6	12.3	5.6	28.2	10.0	4.6	21.4	11.8	5.4	25.4	8.8	3.2	14.8	7.8	3.7	17.0								
Physical contingency	87.1	17.3	110.4	3.1	0.7	4.9	12.6	3.1	20.3	9.7	2.4	15.8	9.9	2.5	16.3	10.2	2.7	16.9	7.0	1.9	11.6	7.2	1.9	12.0	3.7	1.0	6.2	3.8	1.1	6.4								
Total (1+2)	738.1	1,765.0	18,868.4	33.8	568.7	1,455.5	138.6	665.0	1,801.2	106.6	625.9	1,671.4	109.4	930.1	2,434.6	112.3	1,240.7	3,214.1	76.8	1,289.9	3,301.6	76.8	1,054.2	2,714.2	40.4	780.3	1,981.2	41.5	497.1	1,284.3								
a. Land Acquisition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Price escalation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Physical contingency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
b. DOA Administration cost	0.0	397.3	993.2	0.0	29.1	72.8	0.0	36.0	90.0	0.0	33.4	83.5	0.0	48.7	121.7	0.0	64.3	160.7	0.0	66.0	165.1	0.0	54.3	135.7	0.0	39.8	99.5	0.0	25.7	64.2								
c. Other cost (Market Board, ATMA etc.)	0.0	295.7	739.3	0.0	24.8	61.5	0.0	27.7	69.3	0.0	27.4	68.5	0.0	35.5	83.8	0.0	39.6	99.0	0.0	41.0	102.5	0.0	37.9	94.8	0.0	34.0	85.0	0.0	30.0	75.0								
d. VAT	0.0	794.7	1,986.6	0.0	56.2	145.6	0.0	72.0	180.1	0.0	66.8	167.1	0.0	97.4	243.4	0.0	128.5	321.4	0.0	132.1	330.2	0.0	108.6	271.4	0.0	79.6	199.1	0.0	51.4	128.4								
e. Import Tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total (a+b+c+d+e)	0.0	1,467.6	3,719.0	0.0	111.9	279.8	0.0	135.7	339.3	0.0	127.8	318.1	0.0	179.8	448.9	0.0	232.4	581.1	0.0	239.1	597.8	0.0	200.7	501.8	0.0	153.4	383.6	0.0	107.1	267.7								
GRAND TOTAL (A+B+C)	738.1	9,139.7	23,597.5	33.8	680.6	1,735.3	138.6	800.8	2,140.5	106.6	753.5	1,990.5	109.4	1,109.6	2,683.5	112.3	1,473.2	3,795.2	76.8	1,528.0	3,899.4	76.8	1,254.9	3,218.1	40.4	933.8	2,374.8	41.5	604.2	1,552.0								

Base Year For Cost Estimation: **Sect. 2008**
 Exchange Rates: **Rs. 100 = 215 Yen**
 Price Escalation: **FC: 2.8%**
LC: 4.8%
 Physical Contingency **10%**
 Physical Contingency for Consultant **10%**
 Administration Cost = **5%** of the Eligible portion
 VAT = **10%** of the expenditures in local currency

Attachment I-3 Financial Crop Budget (1/7)

Component	Unit	Price	Without Project Condition						With Project Condition								
			Rainfed		Life Saving		Irrigated		Rainfed		Life Saving		Irrigated				
			Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)			
Crop: Maize																	
1. Gross Income	ton	6,000	1.8	10,800	-	-	3.6	21,600	1.8	10,800	-	-	4.0	24,000			
2. Production Cost																	
2.1 Material																	
Seed / Seedlings	kg	30	40	1,200	-	-	60	1,800	40	1,200	-	-	60	1,800			
Farm manure	ton	200	3	600	-	-	3	600	3	600	-	-	3	600			
Fertilizers	kg	7	50	350	-	-	80	560	50	350	-	-	80	560			
Agro-Chemicals	liter	250	1	250	-	-	2	500	1	250	-	-	2	500			
Sub-Total (2.1)				2,400	-	-		3,460		2,400	-	-		3,460			
2.2 Labor																	
Family labor	man-day	100	55	5,500	-	-	80	8,000	55	5,500	-	-	80	8,000			
Hired labor	man-day	100	10	1,000	-	-	20	2,000	10	1,000	-	-	30	3,000			
Bullock labor	Animal-day	200	5	1,000	-	-	10	2,000	5	1,000	-	-	10	2,000			
Sub-Total (2.2)				7,500	-	-		12,000		7,500	-	-		13,000			
2.3 Others																	
Transportation Cost	Lump sum			300	-	-		600		300	-	-		800			
Irrigation Cost	Lump sum			0	-	-		1,000		0	-	-		1,500			
Others	5%			510	-	-		800		510	-	-		860			
Sub-Total (2.3)				810	-	-		2,400		810	-	-		3,160			
3. Net Income				90	-	-		3,740		90	-	-		4,380			
(proportion of net income against gross income)				0.8%	-	-		17.3%		0.8%	-	-		18.3%			

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-3 Financial Crop Budget (2/7)

Component	Unit	Price	Without Project Condition						With Project Condition								
			Rainfed		Life Saving		Irrigated		Rainfed		Life Saving		Irrigated				
			Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)			
Crop: Paddy																	
1. Gross Income	ton	8,000	1.6	12,800	-	-	3.0	24,000	1.6	12,800	-	-	-	-	3.5	28,000	
yield range: 109,100 ton, 79,500 ha																	
2. Production Cost																	
2.1 Material																	
Seed / Seedlings	kg	20	40	800	-	-	50	1,000	40	800	-	-	-	60	1,200		
Farm manure	ton	200	3	600	-	-	3	600	3	600	-	-	-	3	600		
Fertilizers	kg	7	60	420	-	-	80	560	60	420	-	-	-	80	560		
Pesticides / Chemicals	liter	250	1	250	-	-	2	500	1	250	-	-	-	2	500		
Sub-Total (2.1)				2,070	-	-		2,660		2,070	-	-			2,860		
2.2 Labor																	
Family labor	man-day	100	70	7,000	-	-	90	9,000	70	7,000	-	-	-	90	9,000		
Hired labor	man-day	100	5	500	-	-	20	2,000	5	500	-	-	-	40	4,000		
Bullock labor	Animal-day	200	10	2,000	-	-	12	2,400	10	2,000	-	-	-	12	2,400		
Sub-Total (2.2)				9,500	-	-		13,400		9,500	-	-			15,400		
2.3 Others																	
Transportation Cost	Lump sum			300	-	-		500		300	-	-			600		
Irrigation Cost	Lump sum			0	-	-		1,500		0	-	-			1,500		
Others	5%			590	-	-		830		590	-	-			940		
Sub-Total (2.3)				890	-	-		2,830		890	-	-			3,040		
3. Net Income				340	-	-		5,110		340	-	-			6,700		
(proportion of net income against gross income)				2.7%	-	-		21.3%		2.7%	-	-			23.9%		

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-3 Financial Crop Budget (3/7)

Component	Unit	Price	Without Project Condition						With Project Condition					
			Rainfed		Life Saving		Irrigated		Rainfed		Life Saving		Irrigated	
			Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)
Crop: Wheat														
1. Gross Income	ton	9,000	1.5	13,500	-	-	2.7	24,300	1.5	13,500	-	-	3.0	27,000
yield range: 687,500 ton, 367,700 ha														
2. Production Cost				13,030			17,940		13,030				19,170	
2.1 Material														
Seed / Seedlings	kg	10	120	1,200	-	-	140	1,400	120	1,200	-	-	150	1,500
Farm manure	ton	200	3	600	-	-	3	600	3	600	-	-	3	600
Fertilizers	kg	7	80	560	-	-	90	630	80	560	-	-	100	700
Pesticides / Chemicals	liter	250	1	250	-	-	2	500	1	250	-	-	2	500
Sub-Total (2.1)				2,610				3,130		2,610				3,300
2.2 Labor														
Family labor	man-day	100	70	7,000	-	-	100	10,000	70	7,000	-	-	100	10,000
Hired labor	man-day	100	5	500	-	-	5	500	5	500	-	-	10	1,000
Bullock labor	Animal-day	200	10	2,000	-	-	10	2,000	10	2,000	-	-	12	2,400
Sub-Total (2.2)				9,500				12,500		9,500				13,400
2.3 Others														
Transportation Cost	Lump sum			300	-	-		500		300	-	-		600
Irrigation Cost	Lump sum			0	-	-		1,000		0	-	-		1,000
Others	5%			620	-	-		810		620	-	-		870
Sub-Total (2.3)				920				2,310		920				2,470
3. Net Income				470				6,360		470				7,830
(proportion of net income against gross income)														
				3.5%				26.2%		3.5%				29.0%

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-3 Financial Crop Budget (4/7)

Component	Unit	Price	Without Project Condition						With Project Condition											
			Rainfed			Life Saving			Irrigated			Rainfed			Life Saving			Irrigated		
			Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)
Crop: Tomatoes																				
1. Gross Income	ton	4,000	18.0	72,000	24.0	96,000	30.0	120,000	25.1	100,400	28.3	113,200	31.4	125,600						
(price range: 2,800 to 6,100)																				
2. Production Cost				60,940		80,260		97,820		81,900		92,250		101,850						
2.1 Material																				
Seed / Seedlings	gr	40	150	6,000	180	7,200	250	10,000	150	6,000	200	8,000	250	10,000						
Farm manure	ton	200	10	2,000	10	2,000	10	2,000	10	2,000	13	2,600	15	3,000						
Fertilizers	kg	7	450	3,150	450	3,150	450	3,150	450	3,150	450	3,150	480	3,360						
Pesticides / Chemicals	liter	250	5	1,250	5	1,250	5	1,250	6	1,500	7	1,750	8	2,000						
Sub-Total (2.1)				12,400		13,600		16,400		12,650		15,500		18,360						
2.2 Labor																				
Family labor	man-day	100	300	30,000	300	30,000	300	30,000	300	30,000	300	30,000	300	30,000						
Hired labor	man-day	100	20	2,000	150	15,000	240	24,000	180	18,000	220	22,000	250	25,000						
Bullock labor	Animal-day	200	25	5,000	25	5,000	29	5,800	27	5,400	28	5,600	30	6,000						
Sub-Total (2.2)				37,000		50,000		59,800		53,400		57,600		61,000						
2.3 Others																				
Transportation Cost	Lump sum			6,000		8,000		10,000		8,400		9,400		10,500						
Irrigation Cost	Lump sum			0		1,500		3,000		0		1,500		3,000						
Others	10%			5,540		7,160		8,620		7,450		8,250		8,990						
Sub-Total (2.3)				11,540		16,660		21,620		15,850		19,150		22,490						
3. Net Income				11,060		15,740		22,180		18,500		20,950		23,750						
(proportion of net income against gross income)																				
				15.4%		16.4%		18.5%		18.4%		18.5%		18.9%						

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-3 Financial Crop Budget (5/7)

Component	Unit	Price	Without Project Condition						With Project Condition											
			Rainfed			Life Saving			Irrigated			Rainfed			Life Saving			Irrigated		
			Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)
Crop: Potatoes																				
1. Gross Income	ton	5,000	6.9	34,500	9.2	46,000	11.5	57,500	11.8	59,000	13.2	66,000	14.7	73,500						
(price range: 3,800 to 6,400)																				
2. Production Cost				28,720		38,080		47,870		46,040		51,390		58,500						
2.1 Material																				
Seed / Seedlings	kg/gr/no.	10	500	5,000	500	5,000	600	6,000	650	6,500	700	7,000	800	8,000						
Farm manure	ton	200	8	1,600	8	1,600	8	1,600	10	2,000	11	2,200	12	2,400						
Fertilizers	kg	7	180	1,260	200	1,400	220	1,540	200	1,400	200	1,400	200	1,400						
Pesticides / Chemicals	liter	250	5	1,250	5	1,250	5	1,250	5	1,250	5	1,250	5	1,250						
Sub-Total (2.1)				9,110		9,250		10,390		11,150		11,850		13,050						
2.2 Labor																				
Family labor	man-day	100	80	8,000	120	12,000	150	15,000	150	15,000	150	15,000	160	16,000						
Hired labor	man-day	100	20	2,000	40	4,000	60	6,000	60	6,000	80	8,000	100	10,000						
Bullock labor	Animal-day	200	20	4,000	20	4,000	22	4,400	23	4,600	24	4,800	25	5,000						
Sub-Total (2.2)				14,000		20,000		25,400		25,600		27,800		31,000						
2.3 Others																				
Transportation Cost	Lump sum			3,000		4,000		5,000		5,100		5,700		6,400						
Irrigation Cost	Lump sum			0		1,500		3,000		0		1,500		3,000						
Others	10%			2,610		3,330		4,080		4,190		4,540		5,050						
Sub-Total (2.3)				5,610		8,830		12,080		9,290		11,740		14,450						
3. Net Income				5,780		7,920		9,630		12,960		14,610		15,000						
(proportion of net income against gross income)				16.8%		17.2%		16.7%		22.0%		22.1%		20.4%						

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-3 Financial Crop Budget (6/7)

Component	Unit	Price	Without Project Condition						With Project Condition								
			Rainfed		Life Saving		Irrigated		Rainfed		Life Saving		Irrigated				
			Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)			
Crop: Peas																	
1. Gross Income	ton	9,000	6.2	55,800	8.3	74,700	10.4	93,600	8.3	74,700	9.4	84,600	10.4	93,600			
(price range: 9,000 to 15,000)																	
2. Production Cost																	
2.1 Material																	
Seed / Seedlings	kg/gr/no.	40	100	4,000	130	5,200	170	6,800	130	5,200	150	6,000	170	6,800			
Farm manure	ton	200	8	1,600	8	1,600	8	1,600	8	1,600	8	1,600	8	1,600			
Fertilizers	kg	7	100	700	100	700	100	700	100	700	100	700	100	700			
Pesticides / Chemicals	liter	250	3	750	3	750	3	750	3	750	3	750	3	750			
Sub-Total (2.1)				7,050		8,250		9,850		8,250		9,050		9,850			
2.2 Labor																	
Family labor	man-day	100	240	24,000	320	32,000	400	40,000	320	32,000	360	36,000	400	40,000			
Hired labor	man-day	100	20	2,000	30	3,000	40	4,000	20	2,000	30	3,000	40	4,000			
Bullock labor	Animal-day	200	15	3,000	16	3,200	16	3,200	15	3,000	15	3,000	15	3,000			
Sub-Total (2.2)				29,000		38,200		47,200		37,000		42,000		47,000			
2.3 Others																	
Transportation Cost	Lump sum			1,500		2,000		2,500		2,000		2,300		2,500			
Irrigation Cost	Lump sum			0		1,000		2,000		0		1,000		2,000			
Others	10%			3,760		4,850		5,960		4,730		5,340		5,940			
Sub-Total (2.3)				5,260		7,850		10,460		6,730		8,640		10,440			
3. Net Income				14,490		20,400		26,090		22,720		24,910		26,310			
(proportion of net income against gross income)				26.0%		27.3%		27.9%		30.4%		29.4%		28.1%			

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-3 Financial Crop Budget (7/7)

Component	Unit	Price	Without Project Condition						With Project Condition											
			Rainfed			Life Saving			Irrigated			Rainfed			Life Saving			Irrigated		
			Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)
Crop: Cauliflower																				
1. Gross Income	ton	7,000	9.5	66,500	88,900	15.9	111,300	9.9	69,300	13.2	92,400	16.5	115,500							
(price range: 6,700 to 14,400)																				
2. Production Cost				48,570	63,600		78,740		49,780		66,130		82,590							
2.1 Material																				
Seed / Seedlings	kg/gr/no.	1	400	400	500	700	700	400	400	600	600	700	700							
Farm manure	ton	200	8	1,600	1,600	8	1,600	8	1,600	8	1,600	8	1,600							
Fertilizers	kg	7	200	1,400	1,400	200	1,400	200	1,400	200	1,400	200	1,400							
Pesticides / Chemicals	liter	250	5	1,250	1,250	5	1,250	5	1,250	5	1,250	5	1,250							
Sub-Total (2.1)				4,650	4,750		4,950		4,650		4,850		5,750							
2.2 Labor																				
Family labor	man-day	100	300	30,000	40,000	500	50,000	310	31,000	420	42,000	510	51,000							
Hired labor	man-day	100	20	2,000	3,000	40	4,000	20	2,000	30	3,000	55	5,500							
Bullock labor	Animal-day	200	20	4,000	4,000	20	4,000	20	4,000	20	4,000	20	4,000							
Sub-Total (2.2)				36,000	47,000		58,000		37,000		49,000		60,500							
2.3 Others																				
Transportation Cost	Lump sum			3,500	4,700		5,900		3,600		4,900		6,100							
Irrigation Cost	Lump sum			0	1,500		3,000		0		1,500		3,000							
Others	10%			4,420	5,650		6,890		4,530		5,880		7,240							
Sub-Total (2.3)				7,920	11,850		15,790		8,130		12,280		16,340							
3. Net Income				17,930	25,300		32,560		19,520		26,270		32,910							
(proportion of net income against gross income)				27.0%	28.5%		29.3%		28.2%		28.4%		28.5%							

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-4 Economic Crop Budget (1/7)

Component	Unit	Price	Without Project Condition						With Project Condition											
			Rainfed			Life Saving			Irrigated			Rainfed			Life Saving			Irrigated		
			Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)
Crop: Maize																				
1. Gross Income	ton	5,700	1.8	10,260	-	-	3.6	20,520	1.8	10,260	-	-	-	4.0	22,800					
2. Production Cost				10,171				16,968		10,171					18,643					
2.1 Material																				
Seed / Seedlings	kg	28.50	40	1,140	-	-	60	1,710	40	1,140	-	-	-	60	1,710					
Farm manure	ton	190	3	570	-	-	3	570	3	570	-	-	-	3	570					
Fertilizers	kg	6.65	50	333	-	-	80	532	50	333	-	-	-	80	532					
Agro-Chemicals	liter	238	1	238	-	-	2	476	1	238	-	-	-	2	476					
Sub-Total (2.1)				2,281				3,288		2,281					3,288					
2.2 Labor																				
Family labor	man-day	95	55	5,225	-	-	80	7,600	55	5,225	-	-	-	80	7,600					
Hired labor	man-day	95	10	950	-	-	20	1,900	10	950	-	-	-	30	2,850					
Bullock labor	Animal-day	190	5	950	-	-	10	1,900	5	950	-	-	-	10	1,900					
Sub-Total (2.2)				7,125				11,400		7,125					12,350					
2.3 Others																				
Transportation Cost	Lump sum			285	-	-		570		285	-	-	-		760					
Irrigation Cost	Lump sum			0	-	-		950		0	-	-	-		1,425					
Others	5%			480	-	-		760		480	-	-	-		820					
Sub-Total (2.3)				765				2,280		765					3,005					
3. Net Income				90				3,552		90					4,157					
(proportion of net income against gross income)				0.9%				17.3%		0.9%					18.2%					

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-4 Economic Crop Budget (2/7)

Component	Unit	Price	Without Project Condition				With Project Condition							
			Rainfed		Life Saving		Rainfed		Life Saving		Irrigated			
			Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)		
Crop: Paddy														
1. Gross Income	ton	7,600	1.6	12,160	-	-	3.0	22,800	1.6	12,160	3.5	26,600		
2. Production Cost														
2.1 Material														
Seed / Seedlings	kg	19.00	40	760	-	-	50	950	40	760	60	1,140		
Farm manure	ton	190	3	570	-	-	3	570	3	570	3	570		
Fertilizers	kg	6.65	60	399	-	-	80	532	60	399	80	532		
Pesticides / Chemicals	liter	238	1	238	-	-	2	476	1	238	2	476		
Sub-Total (2.1)				1,967	-	-		2,528		1,967		2,718		
2.2 Labor														
Family labor	man-day	95	70	6,650	-	-	90	8,550	70	6,650	90	8,550		
Hired labor	man-day	95	5	475	-	-	20	1,900	5	475	40	3,800		
Bullock labor	Animal-day	190	10	1,900	-	-	12	2,280	10	1,900	12	2,280		
Sub-Total (2.2)				9,025	-	-		12,730		9,025		14,630		
2.3 Others														
Transportation Cost	Lump sum			285	-	-		475		285		570		
Irrigation Cost	Lump sum			0	-	-		1,425		0		1,425		
Others	5%			560	-	-		790		560		900		
Sub-Total (2.3)				845	-	-		2,690		845		2,895		
3. Net Income														
(proportion of net income against gross income)				323	-	-		4,852		323		6,357		
				2.7%	-	-		21.3%		2.7%		23.9%		

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-4 Economic Crop Budget (3/7)

Component	Unit	Price	Without Project Condition						With Project Condition											
			Rainfed			Life Saving			Irrigated			Rainfed			Life Saving			Irrigated		
			Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	(Rs./ha)
Crop: Wheat																				
1. Gross Income	ton	8,600	1.5	12,900	-	-	2.7	23,220	1.5	12,900	3.0	25,800								
2. Production Cost				12,380			17,045			12,380		18,206								
2.1 Material																				
Seed / Seedlings	kg	9.50	120	1,140	-	140	1,330	120	1,140	150	1,425									
Farm manure	ton	190	3	570	-	3	570	3	570	3	570									
Fertilizers	kg	6.65	80	532	-	90	599	80	532	100	665									
Pesticides / Chemicals	liter	238	1	238	-	2	476	1	238	2	476									
Sub-Total (2.1)				2,480			2,975		2,480		3,136									
2.2 Labor																				
Family labor	man-day	95	70	6,650	-	100	9,500	70	6,650	100	9,500									
Hired labor	man-day	95	5	475	-	5	475	5	475	10	950									
Bullock labor	Animal-day	190	10	1,900	-	10	1,900	10	1,900	12	2,280									
Sub-Total (2.2)				9,025			11,875		9,025		12,730									
2.3 Others																				
Transportation Cost	Lump sum			285	-		475		285		570									
Irrigation Cost	Lump sum			0	-		950		0		950									
Others	5%			590	-		770		590		820									
Sub-Total (2.3)				875			2,195		875		2,340									
3. Net Income				520			6,176		520		7,594									
(proportion of net income against gross income)				4.0%		26.6%		4.0%		29.4%										

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-4 Economic Crop Budget (4/7)

Component	Unit	Price	Without Project Condition						With Project Condition					
			Rainfed		Life Saving		Irrigated		Rainfed		Life Saving		Irrigated	
			Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)
Crop: Tomatoes														
1. Gross Income	ton	3,800	18.0	68,400	24.0	91,200	30.0	114,000	25.1	95,380	28.3	107,540	31.4	119,320
2. Production Cost				57,993		77,985		92,933		77,801		87,644		96,761
2.1a Seed / Seedlings	gr	38.00	150	5,700	180	7,200	250	9,500	150	5,700	200	7,600	250	9,500
Farm manure	ton	190	10	1,900	10	2,000	10	1,900	10	1,900	13	2,470	15	2,850
Fertilizers	kg	6.65	450	2,993	450	3,150	450	2,993	450	2,993	450	2,993	480	3,192
Pesticides / Chemicals	liter	238	5	1,190	5	1,250	5	1,190	6	1,428	7	1,666	8	1,904
Sub-Total (2.1)				11,783		13,600		15,583		12,021		14,729		17,446
2.2a Family labor	man-day	95	300	28,500	300	30,000	300	28,500	300	28,500	300	28,500	300	28,500
Hired labor	man-day	95	20	1,900	150	15,000	240	22,800	180	17,100	220	20,900	250	23,750
Bullock labor	Animal-day	190	25	4,750	25	5,000	29	5,510	27	5,130	28	5,320	30	5,700
Sub-Total (2.2)				35,150		50,000		56,810		50,730		54,720		57,950
2.3 O Transportation Cost	Lump sum			5,700		6,000		9,500		7,980		8,930		9,975
Irrigation Cost	Lump sum			0		1,425		2,850		0		1,425		2,850
Others	10%			5,260		6,960		8,190		7,070		7,840		8,540
Sub-Total (2.3)				10,960		14,385		20,540		15,050		18,195		21,365
3. Net Income				10,508		13,215		21,068		17,580		19,897		22,559
(proportion of net income against gross income)				15.4%		14.5%		18.5%		18.4%		18.5%		18.9%

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-4 Economic Crop Budget (5/7)

Component	Unit	Price	Without Project Condition						With Project Condition											
			Rainfed			Life Saving			Irrigated			Rainfed			Life Saving			Irrigated		
			Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)
Crop: Potatoes																				
1. Gross Income																				
ton		4,800	6.9	33,120	9.2	44,160	11.5	55,200	11.8	56,640	13.2	63,360	14.7	70,560						
2. Production Cost																				
2.1 Material																				
Seed / Seedlings	kg/gr/no.	9.50	500	4,750	500	4,750	600	5,700	650	6,175	700	6,650	800	7,600						
Farm manure	ton	190	8	1,520	8	1,520	8	1,520	10	1,900	11	2,090	12	2,280						
Fertilizers	kg	6.65	180	1,197	200	1,330	220	1,463	200	1,330	200	1,330	200	1,330						
Pesticides / Chemicals	liter	238	5	1,190	5	1,190	5	1,190	5	1,190	5	1,190	5	1,190						
Sub-Total (2.1)				8,657		8,790		9,873		10,595		11,260		12,400						
2.2 Labor																				
Family labor	man-day	95	80	7,600	120	11,400	150	14,250	150	14,250	150	14,250	160	15,200						
Hired labor	man-day	95	20	1,900	40	3,800	60	5,700	60	5,700	80	7,600	100	9,500						
Bullock labor	Animal-day	190	20	3,800	20	3,800	22	4,180	23	4,370	24	4,560	25	4,750						
Sub-Total (2.2)				13,300		19,000		24,130		24,320		26,410		29,450						
2.3 Others																				
Transportation Cost	Lump sum			2,850		3,800		4,750		4,845		5,415		6,080						
Irrigation Cost	Lump sum			0		1,425		2,850		0		1,425		2,850						
Others	10%			2,480		3,160		3,880		3,980		4,310		4,790						
Sub-Total (2.3)				5,330		8,385		11,480		8,825		11,150		13,720						
3. Net Income																				
(proportion of net income against gross income)				5,833		7,985		9,717		12,900		14,540		14,990						
				17.6%		18.1%		17.6%		22.8%		22.9%		21.2%						

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-4 Economic Crop Budget (6/7)

Component	Unit	Price	Without Project Condition						With Project Condition					
			Rainfed		Life Saving		Irrigated		Rainfed		Life Saving		Irrigated	
			Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)
Crop: Peas														
1. Gross Income	ton	8,600	6.2	53,320	8.3	71,380	10.4	89,440	8.3	71,380	9.4	80,840	10.4	89,440
2. Production Cost				39,244		51,579		64,134		49,379		56,704		63,924
2.1 Material														
Seed / Seedlings	kg/gr/no.	38.00	100	3,800	130	4,940	170	6,460	130	4,940	150	5,700	170	6,460
Farm manure	ton	190	8	1,520	8	1,520	8	1,520	8	1,520	8	1,520	8	1,520
Fertilizers	kg	6.65	100	665	100	665	100	665	100	665	100	665	100	665
Pesticides / Chemicals	liter	238	3	714	3	714	3	714	3	714	3	714	3	714
Sub-Total (2.1)				6,699		7,839		9,359		7,839		8,599		9,359
2.2 Labor														
Family labor	man-day	95	240	22,800	320	30,400	400	38,000	320	30,400	360	34,200	400	38,000
Hired labor	man-day	95	20	1,900	30	2,850	40	3,800	20	1,900	30	2,850	40	3,800
Bullock labor	Animal-day	190	15	2,850	16	3,040	16	3,040	15	2,850	15	2,850	15	2,850
Sub-Total (2.2)				27,550		36,290		44,840		35,150		39,900		44,650
2.3 Others														
Transportation Cost	Lump sum			1,425		1,900		2,375		1,900		2,185		2,375
Irrigation Cost	Lump sum			0		950		1,900		0		950		1,900
Others	10%			3,570		4,600		5,660		4,490		5,070		5,640
Sub-Total (2.3)				4,995		7,450		9,935		6,390		8,205		9,915
3. Net Income				14,076		19,801		25,306		22,001		24,136		25,516
(proportion of net income against gross income)				26.4%		27.7%		28.3%		30.8%		29.9%		28.5%

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-4 Economic Crop Budget (7/7)

Component	Unit	Price	Without Project Condition						With Project Condition								
			Rainfed		Life Saving		Irrigated		Rainfed		Life Saving		Irrigated				
			Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)	Vol. (unit/ha)	Amount (Rs./ha)			
Crop: Cauliflower																	
1. Gross Income	ton	6,700	9.5	63,650	12.7	85,090	15.9	106,530	9.9	66,330	13.2	88,440	16.5	110,550			
2. Production Cost																	
2.1 Material																	
Seed / Seedlings	kg/gr/no.	0.95	400	380	500	475	700	665	400	380	600	570	700	665			
Farm manure	ton	190	8	1,520	8	1,520	8	1,520	8	1,520	8	1,520	12	2,280			
Fertilizers	kg	6.65	200	1,330	200	1,330	200	1,330	200	1,330	200	1,330	200	1,330			
Pesticides / Chemicals	liter	238	5	1,190	5	1,190	5	1,190	5	1,190	5	1,190	5	1,190			
Sub-Total (2.1)				4,420		4,515		4,705		4,420		4,610		5,465			
2.2 Labor																	
Family labor	man-day	95	300	28,500	400	38,000	500	47,500	310	29,450	420	39,900	510	48,450			
Hired labor	man-day	95	20	1,900	30	2,850	40	3,800	20	1,900	30	2,850	55	5,225			
Bullock labor	Animal-day	190	20	3,800	20	3,800	20	3,800	20	3,800	20	3,800	20	3,800			
Sub-Total (2.2)				34,200		44,650		55,100		35,150		46,550		57,475			
2.3 Others																	
Transportation Cost	Lump sum			3,325		4,465		5,605		3,420		4,655		5,795			
Irrigation Cost	Lump sum			0		1,425		2,850		0		1,425		2,850			
Others	10%			4,190		5,360		6,540		4,300		5,580		6,870			
Sub-Total (2.3)				7,515		11,250		14,995		7,720		11,660		15,515			
3. Net Income				17,515		24,675		31,730		19,040		25,620		32,095			
(proportion of net income against gross income)				27.5%		29.0%		29.8%		28.7%		29.0%		29.0%			

Note: Irrigation Cost includes cost for O&M and water management.

Attachment I-6 Project Cost for Action Plan

(unit: Rs. million)

Item	Project Cost			
	Financial		Ecomic	
1. Procurement and Works				
1.1 Institutional Development Program				
(1) Strengthening of Department of Agriculture	309.4	3.3%	293.9	4.9%
(2) Strengthening of Extension Service Function	247.1	2.6%	234.7	3.9%
Sub-total	556.5	5.9%	528.6	8.8%
1.2 Farmers' Support Program				
(1) Vegetable Promotion	522.5	5.5%	496.4	8.3%
(2) Food Grain Productivity Improvement	128.1	1.4%	121.7	2.0%
(3) Integrated Farm Management	78.6	0.8%	74.7	1.2%
(4) Post Harvest Processing Promotion	2.2	0.0%	2.1	0.0%
(5) Marketing System Improvement	130.3	1.4%	123.8	2.1%
Sub-total	861.7	9.1%	818.7	13.7%
1.3 Infrastructure Development Program				
(1) Infrastructure Development/Improvement	3,757.0	39.8%	3,569.2	59.6%
(2) Infrastructure Development Support	175.0	1.9%	166.3	2.8%
Sub-total	3,932.0	41.7%	3,735.5	62.4%
Total of 1.1+1.2+1.3	5,350.2	56.7%	5,082.8	84.9%
1.4 Price escalation	1,432.8	15.2%	0.0	0.0%
1.5 Physical contingency	678.3	7.2%	508.3	8.5%
Total of Procurement and Works	7,461.3	79.1%	5,591.1	93.4%
2. Engineering Services				
2.1 Internationa Project Consultants	379.7	4.0%	360.7	6.0%
2.2 Price Escalation	62.1	0.7%	0.0	0.0%
2.3 Physical Contingency	44.2	0.5%	36.1	0.6%
Total of Engineering Services	485.9	5.2%	396.8	6.6%
Total of of the above (1 & 2)	7,947.2	84.2%	5,987.9	100.0%
3. Administration and Other Cost				
(1) Administration cost	397.3	4.2%	0.0	0.0%
(2) Other cost (Marketing Board, ATMA, etc.)	295.7	3.1%	0.0	0.0%
(3) Tax & Duty	794.6	8.4%	0.0	0.0%
Total of Admiistration and Other Cost	1,487.7	15.8%	0.0	0.0%
Grand Total	9,434.9	100.0%	5,987.9	100.0%

Attachment I-7 Annual Disbursement Schedule of the Economic Cost

(1) Financial Cost

	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
1. Procurement / Works	559.9	631.4	598.4	902.0	1,212.2	1,269.4	1,032.9	768.9	486.2	7,461.3
1.1 Institutional Development Program	371.0	186.0	-	-	-	-	-	-	-	556.5
1.2 Farmers' Support Program	115.0	134.0	75.0	86.0	90.0	89.0	89.0	89.0	94.0	861.7
1.3 Infrastructure Development Program	0.0	203.0	398.0	594.0	782.0	782.0	587.0	391.0	196.0	3,932.0
1.4 Price Escalation	23.0	51.0	71.0	140.0	230.0	283.0	263.0	219.0	152.0	1,432.8
1.5 Physical Contingency	50.9	57.4	54.4	82.0	110.2	115.4	93.9	69.9	44.2	678.3
2. Consulting services	22.0	89.1	69.3	71.5	73.7	51.7	52.8	27.5	28.6	485.9
(1) Project Management Consultant	19.0	76.0	57.0	57.0	57.0	38.0	38.0	19.0	19.0	379.7
(2) Price escalation	1.0	5.0	6.0	8.0	10.0	9.0	10.0	6.0	7.0	62.1
(3) Physical contingency	2.0	8.1	6.3	6.5	6.7	4.7	4.8	2.5	2.6	44.2
3. Other Cost	112.0	136.0	127.0	180.0	233.0	239.0	201.0	154.0	107.0	1,487.7
a Administration cost	29.0	36.0	33.0	49.0	64.0	66.0	54.0	40.0	26.0	397.3
b Other cost (Marketing Board, etc.)	25.0	28.0	27.0	34.0	40.0	41.0	38.0	34.0	30.0	295.7
c VAT	58.0	72.0	67.0	97.0	129.0	132.0	109.0	80.0	51.0	794.6
GRAND TOTAL (1. to 6.)	693.9	856.5	794.7	1,153.5	1,518.9	1,560.1	1,286.7	950.4	621.8	9,434.9

(2) Economic Cost

	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
1. Procurement / Works	508.1	545.9	494.6	710.5	910.5	910.4	706.6	502.1	302.4	5,591.1
1.1 Institutional Development Program	352.4	176.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	528.6
1.2 Farmers' Support Program	109.5	127.1	71.3	81.6	85.1	85.0	85.0	85.0	89.0	818.7
1.3 Infrastructure Development Program	0.0	193.0	378.4	564.3	742.5	742.5	557.4	371.5	186.0	3,735.5
1.4 Price Escalation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.5 Physical Contingency	46.2	49.6	45.0	64.6	82.8	82.8	64.2	45.6	27.5	508.3
2. Consulting services	19.8	79.3	59.5	59.5	59.5	39.7	39.7	19.8	19.9	396.8
(1) Project Management Consultant	18.0	72.1	54.1	54.1	54.1	36.1	36.1	18.0	18.1	360.7
(2) Price escalation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(3) Physical contingency	1.8	7.2	5.4	5.4	5.4	3.6	3.6	1.8	1.8	36.1
3. Other Cost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a Administration cost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
b Other cost (Marketing Board, etc.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
c VAT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GRAND TOTAL (1. to 6.)	527.9	625.2	554.2	770.0	970.0	950.1	746.3	521.9	322.3	5,987.9

Attachment I-8 Flow of Economic Cost and Benefit

(Rs. million)

Year	Cost				Benefit	Balance
	Initial Cost	O&M Cost	Replacement	Total		
1 2009	528	0	0	528	0	-528
2 2010	625	0	0	625	0	-625
3 2011	554	5	0	559	18	-541
4 2012	770	14	0	784	72	-712
5 2013	970	28	0	998	186	-812
6 2014	950	47	0	997	360	-637
7 2015	746	66	0	812	577	-236
8 2016	522	80	0	602	799	197
9 2017	322	90	0	412	985	573
10 2018		94	0	94	1,111	1,017
11 2019		94	0	94	1,177	1,083
12 2020		94	0	94	1,201	1,107
13 2021		94	0	94	1,201	1,107
14 2022		94	0	94	1,201	1,107
15 2023		94	0	94	1,201	1,107
16 2024		94	0	94	1,201	1,107
17 2025		94	0	94	1,201	1,107
18 2026		94	0	94	1,201	1,107
19 2027		94	0	94	1,201	1,107
20 2028		94	0	94	1,201	1,107
21 2029		94	0	94	1,201	1,107
22 2030		94	97	192	1,201	1,009
23 2031		94	192	286	1,201	915
24 2032		94	286	380	1,201	821
25 2033		94	374	468	1,201	733
26 2034		94	374	468	1,201	733
27 2035		94	283	377	1,201	824
28 2036		94	189	283	1,201	918
29 2037		94	94	189	1,201	1,013
30 2038		94	0	94	1,201	1,107
Total	5,988	2,313	1,889	10,189	1,201	

Economic Internal Rate of Return 13.5%

Sensitivity Analysis by Cost Increase and Benefit Decrease

		Cost Inceas		
		0%	10%	20%
Benefit Decrease	0%	13.5%	12.2%	11.0%
	-10%	12.0%	10.7%	9.6%
	-20%	10.4%	9.1%	8.0%

Present Value at 12% Discount Rate			
Cost	Benefit	Balance	Ratio
4,062	4,525	463	1.11