

# **APPENDIX- IV**

## **PROJECT EVALUATION**

# APPENDIX IV: PROJECT EVALUATION

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## CHAPTER 1 PROJECT EVALUATION

Financial and economic analyses aim at comparing project cost-benefits and evaluating development projects in a tangible way. Generally, evaluation by financial analysis gives relevance of the proposed project from the viewpoint of project agency and it is calculated by market prices. On the other hand, economic evaluation is made with economic prices to estimate the effect of the benefits at national and regional levels derived from the project.

Economic analysis of this project was made in accordance with the contents designed in this study. This contains a common economic evaluation which consists of financial analysis with market prices and economic one through the calculation of such indicators as IRR (Internal Rate of Return), B/C (Benefit/Cost Ratio) and NPV (Net Present Value). In this context, the criteria for selecting project in World Bank or ADB proposed that those sites that have EIRR at the level of 12% or higher should be selected and this can be considered as the opportunity cost of the capital input into this project. The economic analysis was performed under the conditions given below.

### 1.1 Condition, Methodology and Evaluation Cases

#### 1.1.1 Purpose of Evaluation

The purpose of financial evaluation is to assess the benefit of a particular project from an individual economy standpoint, while economic evaluation assesses the project in terms of its contribution to the national economy as a whole.

#### 1.1.2 Methodology of Evaluation

On the basis of project benefit and cost comparison for the two cases of (i) Current Situation without project FW/O) and (ii) rehabilitation means future with project FW), the economic viabilities of the projects are examined in terms of the three criteria of net present value (NPV), benefit-cost ratio (B/C ratio) and internal rate of return (IRR).

#### 1) Evaluation Criteria

##### a) Interpretation of Future Without Project Case

It is assumed that the present conditions will keep status without project.

##### b) Project Life

Project life for rehabilitation of irrigation network and road works is set at 30 years considering the utility life of the proposed facilities and the O&M capacity of the line agency, including construction period works.

##### c) Project Benefit and Cost

Under financial evaluation, project benefit and cost are expressed in terms of market prices (financial prices). Economic evaluation, on the other hand, eliminates transfer payment, export duty, port and handling charges, wholesale margin and application of respective conversion factors. Moreover, project benefit and cost are based on August 2013 year prices.

##### d) Inputs and Outputs

With regard to traded and non-traded goods expressed in financial prices, these are based on August 2013 year prices. On the other hand, in the case of economic prices, the composition of non-traded goods is broken down into traded component, non-traded component, labor and transfer payment. In the case of the traded, non-traded labor components, border price, standard conversion factor (SCF), and shadow wage rate are applied, respectively.

**e) Opportunity Cost of Capital**

Referring to past agriculture-related reports, a discount rate of 12% is applied as the opportunity cost of capital for Myanmar.

**f) Foreign Exchange Rate**

In the evaluation, the foreign exchange rate of US\$ 1 = 975 Kyats as of August 2013 year is applied.

**g) Labor**

Nominal wages are used for financial evaluation. Under economic evaluation, on the other hand, (i) skilled labor is 1.0 and (ii) unskilled labor is also multiplied by 7/12 (7 month employ in a year) but with adjustment of a coefficient of labor productivity, i.e. 0.6.

**1.2 Conversion Factors****1.2.1 Standard Conversion Factor (SCF)**

Estimation of a precise SCF is constrained due to unavailability of recent customs data (the latest published data covers only the period 2010/11 - 2012/2013) and lack of reliable figures in the breakdown of annual customs duties into export and import categories. Under these circumstances, the following estimation method has been adopted to calculate annual export and import customs duty values in recent years. Annual customs duties in the recent years have been computed based on (i) official average customs duty value for the period 2010/11 - 2012/13 year and (ii) estimated import-export ratio to breakdown estimated custom duty values in recent years into import and export portions. Under this method, the same average tariff rate is applied for both imported and exported commodities.

As a result, the SCF is computed at 0.99 based on the official trade and customs data and the recent trade data as shown in Table 1.2.1

**Table 1.2.1 Standard Conversion Factor (SCF)**

Unit: Million Kyats

Year	Value of Imports (CIF) ①	Value of Exports (FOB) ②	Import duties ③	Export duties ④	⑤ = ①+②	⑥ = ①+②+ ③-④	SCF ⑤/⑥
2010/11	6,421.00	8,861.00	63.73	8.90	15,282.00	15,336.83	0.996
2011/12	9,035.00	9,135.00	153.26	9.10	18,170.00	18,314.16	0.990
2012/13	9,068.00	8,977.00	432.85	9.00	18,045.00	18,468.85	0.980
Total Average	8,174.67	8,991.00	216.61	9.00	17,165.67	17,373.28	0.990

Source: Customs Department Office

Standard Conversion Factor 0.99000

**1.2.2 Conversion Factor for Paddy**

Net farm income has been estimated at 196,879 Kyats/acre in financial terms and 197,542 Kyats in economic terms under rain fed paddy cultivation. As a result, the Conversion Factor for Paddy is computed at 0.695 based on the financial price at 196,879 Kyats/acre and economic price at 197,542 Kyats/acre as shown in Table 1.2.2.

**Table 1.2.2 Conversion Factor for Paddy**

Item	Unit	Rice (financial terms)	CF	Rice (economic terms)
FOB price (Yangon)*	US\$/mt	450	-	450
Foreign exchange rate (US\$ 1 =975 Kyats)	Kyats/mt	438,750	-	438,750
Export duty (0%)	Kyats/mt	0	0	0
Port and handling charges	Kyats/mt	5,000	0.99	4,950
Wholesale margin (5%)	Kyats/mt	21,938	0.99	21,718
Wholesale price in Yangon	Kyats/mt	411,813		412,082
Transport (Yangon – Pyay)	Kyats/mt	75,000	0.99	74,250
Ex-mill price	Kyats/mt	336,813		337,832
Miller's margin	Kyats/mt	33,681	0.99	33,344
Milling cost	Kyats/mt	20,000	0.99	19,800
By-product value	Kyats/mt	45,000	0.99	44,550
Farmgate price in milled rice	Kyats/mt	328,131	-	329,237
Farmgate price in paddy (milling recovery at 60%)	Kyats/mt	196,879	-	197,542
Farmgate price in paddy (Pyay)				284,160

Source: JICA Study Team

Conversion Factor

0.695

As a result of calculation based on the Yearly Price Description of Normal Quality Rice in Pyay Market crop Price is shown in Table: 1.2.3.

**Table 1.2.3 Yearly Price Description of Normal Quality Rice in Pyay Market**

(Kyat/30 viss)

Year	Innma Yebaw	Manaw Thukha
2001	2179	2087
2002	4406	4434
2003	6341	6260
2004	4295	4219
2005	6013	5952
2006	9544	9570
2007	14231	14094
2008	13689	13706
2009	12792	12567
2010	14605	14791
2011	14260	13921

Source: DAP office

Conversion factors for Black-Gram have been estimated at 1.07 based on the financial price at 16,776 Kyats/basket and economic price at 15,846Kyats/basket, as shown in Table 1.2.4.

**Table 1.2.4 Conversion Factor for Black Gram**

Item	Unit	Black-Gram (financial terms)	CF	Black Gram (economic terms)
FOB price (Yangon)*	US\$/mt	630	-	300
Foreign exchange rate (US\$ 1 =975 Kyats)	Kyats/mt	614,250	-	614,250
Export duty (0%)	Kyats/mt	0	0	0
Port and handling charges	Kyats/mt	5,000	0.990	4,950
Wholesale margin	Kyats/mt	12,285	0.990	12,162
Wholesale price in Yangon	Kyats/mt	596,965		597,138
Transport (Yangon – Pyay)	Kyats/mt	75,000	0.990	74,250
Farmgate price	Kyats/mt	521,965	-	522,888
	Kyats/Basket	16,776	-	16,806
Farmgate price (Pyay)				15,648

Source: JICA Study Team

Conversion Factor: 1.07

Conversion factors for Chemical Fertilizers have been estimated at 0.77 based on financial price and economic price as shown in Table 1.2.5

**Table 1.2.5 Conversion Factor for Chemical Fertilizers**

Item	Unit	Urea	TSP	MOP	CF	Urea	TSP	MOP
		(N46%)	(P46%)	(K60%)		(N46%)	(P46%)	(K60%)
		financial terms			economic terms			
CIF price (Muse/Tamu)	US\$/mt	355	360	355	-	355	360	355
Foreign exchange rate (US\$ 1 = 975 Kyats)	Kyats/mt	346,125	351,000	346,125	-	346,125	351,000	346,125
Import duty (0%)	Kyats/mt	0	0	0	0	0	0	0
Handling charge	Kyats/mt	3,000	3,000	3,000	0.990	2,970	2,970	2,970
Transport (Chaina – Yangon)	Kyats/mt	55,000	55,000	55,000	0.990	54,450	54,450	54,450
Wholesale margin	Kyats/mt	17,306	17,550	17,306	0.990	17,133	17,375	17,133
Wholesale price in Yangon	Kyats/mt	421,431	426,550	421,431	-	420,678	425,795	420,678
Transport(Yangon – Pyea)	Kyats/mt	70,000	70,000	70,000	0.990	69,300	69,300	69,300
Retail margin	Kyats/mt	49,143	49,655	49,143	0.990	48,652	49,158	48,652
Farmgate price	Kyats/mt	540,574	546,205	540,574	-	538,630	544,253	538,630
Farmgate price(Pyay)	Kyats/mt					700,000	700,000	700,000
		Conversion Factor				0.77	0.78	0.77

Source: JICA Study Team



### 1.2.3 Cases for Project Evaluation

Table 1.2.6 shows the cases to examine the project economic variability; namely, there are 5 cases in total. Base 0 takes into account only the area expansion of black gram as the project benefit, not considering other benefits such as the benefit from road improvement and yield increase. Base 1 considered, on top of Base 0, the benefit accrued from road improvement as reduction of fuels for transporting agricultural products. Base 2 further considers, on top of Base 1, the remaining value of procured machineries after having completed the use in the project. For these 3 basic cases, no yield increase is counted but area expansion of black gram only for a direct agriculture related benefit.

Aside from the basic 3 cases, there are 2 more cases; Case Ext. Service takes into account yield increase both for rice and black gram given an appropriate extension services supported by a team of experts, e.g. a team of technical cooperation project. The level of the yield increase for paddy refers to the outcomes from a pilot project implemented under a JICA development study. The level of the increase applied is 15% and 13% for monsoon paddy and summer paddy respectively. As for the black gram, yield is assumed to increase to the midstream one, which is the highest one amongst the 3 locations of upstream, midstream and downstream.

Last case, Case Road Only, undertakes the project cost of road improvement only and the benefit to be accrued from the road improvement only. The benefit is estimated how much transportation cost will be reduced with the improvement of the road mainly by the reduction of the fuel cost for Trollergyi, a common transportation mean mounted with tractor diesel engine. Note that though road improvement will facilitate rural transportation whereby enhancing rural economy as a whole, this benefit is not counted since it is difficult to estimate such benefit. Annual operation and maintenance cost have been computed based on project cost is multiplied by 0.3% for the period 2014 – 2043year.

Table 1.2.6 Cases for Project Evaluation by Area and Yield Change (Conditions)

Case	Monsoon Paddy		Summer Paddy		Black Gram		Remarks
	Yield	Area	Yield	Area	Yield	Area	
Base 0	Not changed	Not changed	Not changed	Not changed	Not changed	Expand by 117,243ac (47,446ha)	O&M Cost: 0.3%
Base 1	Not changed	Not changed	Not changed	Not changed	Not changed	Expand by 117,243ac (47,447ha)	Benefit from road improvement is not considered O&M Cost: 0.3%
Base 2	Not changed	Not changed	Not changed	Not changed	Not changed	Expand by 117,243ac (47,448ha)	Road benefit and machineries' remaining value are considered. O&M Cost: 0.3%
Ext. Service	Increase by 15% <sup>*1</sup>	Not changed	Increase by 13% <sup>*1</sup>	Not changed	All yields to the Middle portion (highest) one		Benefit from road improvement is not considered. O&M Cost: 0.3%
Road Only	This case considers cost for road improvement and the benefit from the road improvement only. Other costs and benefits are not taken into consideration						

Note;

\*1 Yield increases were recorded by the pilot project under Development Study on Sustainable Agricultural and Rural Development for Poverty Reduction Programme in the CDZ, July 2010, JICA

### 1.2.4 Project Cost

As components of the project cost, those of the civil & structure construction, machineries procurement, engineering service, on-farm irrigation facilities and operation / maintenance are to be estimated. The project cost is subdivided into two portions, i.e., foreign currency (F/C) and local currency (L/C), where L/C portion is converted into economic price by applying SCF. The composition of the project cost is shown in Table 1.2.7.

Total Project cost including contingencies, project management, miscellaneous and O& M (3% of the direct cost) is now estimated at 165,429 million Kyats at financial price, composed of foreign portion (FC) of 85,810 million Kyats and local portion (LC) of 79,619 million Kyats. As per the economic price, the total comes to 159,027 million Kyats composed of FC 85,810 million Kyats and LC 73,216 million Kyats. Concerning civil and structure construction cost, so-called direct cost, by irrigation system, Wegyi system shows the largest cost as 46,337 million Kyats for FC and 43,688 million Kyats for LC, followed by Taung Nyo, and South Nawin and lastly North Nawin.

**Table 1.2.7 Financial and Economic Project Costs, '000Kyats**

Particulars	FINANCIAL PRICE			ECONOMIC PRICE		
	FC	LC	Total	FC	LC	Total
	('000Kyat)	('000Kyat)	('000Kyat)	('000Kyat)	('000Kyat)	('000Kyat)
North Nawin	8,853,517	9,131,937	17,985,454	8,853,517	7,502,789	16,356,306
South Nawin	10,471,300	8,871,117	19,342,417	10,471,300	7,635,235	18,106,535
Wegyi	25,984,725	20,352,398	46,337,123	25,984,725	17,703,744	43,688,469
Taung Nyo	14,464,884	10,841,082	25,305,966	14,464,884	9,972,119	24,437,003
Total of Above	59,774,426	49,196,534	108,970,960	59,774,426	42,813,887	102,588,313
Machineries Procurement	14,785,510	147,855.1	14,933,365.1	14,785,510	146,376	170,713,785
Engineering Service (DD)	2,838,040	729,824	3,567,864	2,838,040	722,526	3,560,566
Engineering Service (SV)	4,326,290	1,112,540	5,438,830	4,326,290	1,101,415	5,427,705
Physical Contingency (5%)	4,086,213.3	2,559,337.7	6,645,551.0	4,086,213.3	2,559,337.7	6,645,551
Project Management (10%)		10,897,096	10,897,096.0		10,897,096.0	10,897,096
Others (Miscellaneous) (5%)		5,744,258	5,744,258		5,744,258	5,744,258
O&M (0.3%)		9,231,226	9,231,226		9,231,226	9,231,226
Total	85,810,479	79,618,671	165,429,150	85,810,479	73,216,122	159,026,601

Source: JICA Survey Team

## Project Benefit

Table 1.2.8 summarizes the project benefit by irrigation system accrued in a year after completion of the rehabilitation works. The benefits are summarized by such cases of; benefit accrued by area expansion of black gram (no yield increase) corresponding to Base 0, benefit associated with road improvement corresponding to Base Road Only, combination of these 2 benefits (Base 1), benefit or counted as minus cost for the remaining value of the procured construction machineries which accrues one time in the following year of the construction completion (part of Base 2 benefit), and benefits which are expected with technical assistances targeting yield increase corresponding to the case of Ext. Service.

**Table 1.2.8 Financial and Economic Project Benefits, '000Kyats**

Particulars	North Nawin	South Nawin	Weyi	Taung Nyo	Total
<b>FINANCIAL PRICE ('000 Kyats)</b>					
1. Agriculture Production *1	5,692,712	8,696,585	369,657	3,739,194	18,498,149
2. Road Improvement *2	192,632	215,183	1,284,633	1,441,516	3,133,963
3. Black Gram + Road Improvement	5,885,344	8,911,767	1,654,291	5,180,710	21,632,112
4. Remaining Machineries Value	7,320,111				7,320,111
5. Ext. Service	7,664,040	11,881,902	10,466,036	6,226,693	36,238,671
M-Paddy	4,944,875	7,315,882	4,121,669	1,695,319	18,077,744
S-Paddy	699,707	1,462,419	1,109,387	275,747	3,547,260
Black Gram	2,019,458	3,103,602	5,234,980	4,255,627	14,613,666
<b>ECONOMIC PRICE ('000 Kyats)</b>					
1. Agriculture Production *1	7,166,753	11,706,649	503,737	4,833,729	24,210,868
2. Road Improvement *2	148,029	213,166	1,271,787	1,427,100	3,060,082
3. Black Gram + Road Improvement	7,314,782	11,919,814	1,775,524	6,260,830	27,270,950
4. Remaining Machineries Value	7,246,910				7,246,910
5. Ext. Service	6,648,095	10,591,617	10,508,589	9,279,506	37,027,807
M-Paddy	3,859,592	5,873,535	3,419,459	3,940,552	17,093,138
S-Paddy	421,371	896,780	702,199	174,835	2,195,186
Black Gram	2,367,132	3,821,302	6,386,930	5,164,119	17,739,483

Remarks: \*1 family labor cost is considered (subtracted from the gross benefit). \*2 benefit accrued from fuel reduction for transportation machineries. Source: JICA Survey Team

### 1.2.5 Benefit Calculation for Road Upgrade

#### 1) Condition

Based on some field surveys by the Survey Team, the distance between villages ranges from 1 mile to 5 miles. Average distance between villages is therefore estimated at about 2-3 miles. Farmlands are located between villages, whereby total distance from a village to a farmland is estimated at 2.1 miles; 1 mile from a village to the intermediate point of the villages, 1.1 mile from the intermediate point to the farm land. The latter will be explained in case 2. About 20 % of farmers use engine transportation equipment, so called 'trollergyi', for their farm activities; their benefit is calculated in case 1. The remaining 80 % of the farmers still use traditional method of bull-cart transportation; their way of transportation can also receive benefit from the project explained in case 2 together with trollergyi transportation.

#### Monsoon Paddy, Summer Paddy, Black Gram

About 1 mile (Case 1)

20 %: Trollergyi

80 %: Bull-cart

#### Monsoon Paddy, Summer Paddy

About 1.1 mile (Case 2)

20 %: Trollergyi

80%: Bull-cart



## 2) Calculation

### a) Case 1: Transportation from Farmer's House to Threshing Place/Farmland

About 20% of the farmers use trollegyi for materials and harvest transportation in the project area according to information from the staff of ID and DOA. In case 1, the 20 % of farmers will be able to obtain profit by road upgrade in the project area, for those farmers who use trollegyi for paddy and material transportation instead of bull-cart. Before road upgrade, fuel consumption is high because high-output of engine is necessary for driving on bumpy road with low speed while decrease of fuel consumption can be expected with the road upgrade that trollegyi can run smoothly. Unit fuel consumption is calculated as follows.

**Table 1.2.9 Basic Fuel Consumption before and after Road Upgrade**

Hp	kW	Fuel consumption (kg/kW*hr)	Speed (km/hr)	Diesel specific gravity (g/cc)	Consumption (lit/km)	(gallon /lit)	(km / mile)	Consumption (gallon/mile)
22	16	0.280	10	0.86	0.521	0.220	0.621	0.184548553
22	16	0.255	25	0.86	0.190	0.220	0.621	0.067228401

Source: the Survey Team (2013)

Cost of diesel is now about 4,000 Kyats per gallon, and then, fuel cost before and after road upgrade is estimated as follows.

**Table 1.2.10 Fuel Cost Estimation for Trollegyi before and after Road Upgrade**

Consumption (gallon / mile)	Unit price of diesel (Kyats / gallon)	Cost (Kyats / mile)	Co-efficient for Chinese engine (X 1.2)
0.184548553	4,000	738	886
0.067228401	4,000	269	323

Source: the Survey Team (2013)

Transportation benefit in case 1 for monsoon paddy cultivation is calculated as follows.

**Table 1.2.11 Trollegyi Transportation Benefit for Monsoon Paddy before and after Road Upgrade**

Items	N. Nawin	S. Nawin	Wegyi	T. Nyo
No. of transportation for M. Paddy (times/ac)	2	2	2	2
No. of transportation for input of M. Paddy (times/ac)	0.5	0.5	0.5	0.5
Total transportation times for M. Paddy (times/ac)	2.5	2.5	2.5	2.5
Average distance from home in case 1 (mile/time/ac)	1	1	1	1
Transportation distance (x 2, mile)	5	5	5	5
Fuel cost before upgrade (kyat/ac: 10km/hr, x 886)	4,430	4,430	4,430	4,430
Fuel cost after upgrade (kyat/ac: 25km/hr, x 323)	1,615	1,615	1,615	1,615
Benefit for transportation (kyat/ac)	2,815	2,815	2,815	2,815
Sown Area for 1st year (ac)	27,679.15	26,886.33	19,455.36	16,611.77
Sown Area for 2nd year (ac)	25,489.39	23,949.60	10,096.25	18,988.74
Sown Area for 3rd year (ac)	0.00	21,872.73	10,876.81	14,380.80
Transportation benefit for 1st year (ac, 20%)	15,583,361	15,137,004	10,953,368	9,352,427
Transportation benefit for 2nd year (ac, 20%)	14,350,527	13,483,625	5,684,189	10,690,661
Transportation benefit for 3rd year (ac, 20%)	0	61,571,735	30,618,220	40,481,952
Sub-total	29,933,888	90,192,364	47,255,777	60,525,040
Total				227,907,069

Source: the Survey Team (2013)

Transportation benefit in case 1 for summer paddy cultivation is calculated as follows.

**Table 1.2.12 Trollegyi Transportation Benefit for Summer Paddy before and after Road Upgrade**

Items	N. Nawin	S. Nawin	Wegyi	T. Nyo
No. of transportation for S. Paddy (times/ac)	2	2	2	2
No. of transportation for input of S. Paddy (times/ac)	0.5	0.5	0.5	0.5
Total transportation times for S. Paddy (times/ac)	2.5	2.5	2.5	2.5
Average distance from home in case 1 (mile/time/ac)	1	1	1	1

Items	N. Nawin	S. Nawin	Wegyi	T. Nyo
Transportation distance (x 2, mile)	5	5	5	5
Fuel cost before upgrade (kyat/ac: 10km/hr, x 886)	4,430	4,430	4,430	4,430
Fuel cost after upgrade (kyat/ac: 25km/hr, x 323)	1,615	1,615	1,615	1,615
Benefit for transportation (kyat/ac)	2,815	2,815	2,815	2,815
Sown Area for 1st year (ac)	6,804.39	5,718.37	772.64	1,324.97
Sown Area for 2nd year (ac)	2,592.95	1,096.21	5,420.55	2,589.96
Sown Area for 3rd year (ac)	0.00	0.00	10,441.55	724.98
Transportation benefit for 1st year (ac, 20%)	3,830,872	3,219,442	434,996	745,958
Transportation benefit for 2nd year (ac, 20%)	1,459,831	617,166	3,051,770	1,458,147
Transportation benefit for 3rd year (ac, 20%)	0	0	5,878,593	408,164
Sub-total	5,290,703	3,836,608	9,365,359	2,612,269
Total				21,104,939

Source: the Survey Team (2013)

Trollergyi can come into the nearest place because it is cultivated in dry season. Transportation benefit in case 1 for black gram cultivation is calculated as follows.

**Table 1.2.13 Trollergyi Transportation Benefit for Black Gram before and after Road Upgrade**

Items	N. Nawin	S. Nawin	Wegyi	T. Nyo
No. of transportation for B. Gram (times/ac)	2	2	2	2
No. of transportation for input of B. Gram (times/ac)	0.5	0.5	0.5	0.5
Total transportation times for B. Gram (times/ac)	2.5	2.5	2.5	2.5
Average distance from home to farmland (mile/time/ac)	2.1	2.1	2.1	2.1
Transportation distance (x 2, mile)	10.5	10.5	10.5	10.5
Fuel cost before upgrade (kyat/ac: 10km/hr, x 886)	9,303	9,303	9,303	9,303
Fuel cost after upgrade (kyat/ac: 25km/hr, x 323)	3,392	3,392	3,392	3,392
Benefit for transportation (kyat/ac)	5,912	5,912	5,912	5,912
Sown Area for 1st year (ac)	13,779.39	26,886.33	18,233.47	16,611.77
Sown Area for 2nd year (ac)	20,520.61	23,949.60	5,221.16	18,988.74
Sown Area for 3rd year (ac)	0.00	21,872.73	2,925.63	14,380.80
Transportation benefit for 1st year (ac, 20%)	16,291,373	31,787,708	21,557,432	19,640,096
Transportation benefit for 2nd year (ac, 20%)	24,261,517	28,315,612	6,172,977	22,450,387
Transportation benefit for 3rd year (ac, 20%)	0	25,860,129	3,458,976	17,002,420
Sub-total	40,552,890	85,963,449	31,189,385	59,092,903
Total				216,798,627

Source: the Survey Team (2013)

### b) Case 2: Paddy Transportation from Farmland to Threshing Place

During rainy season before the road upgrade, farmers out-source transportation works of harvested paddy with straw from farmland to all-weather road where threshing machine can be placed. After upgrade; transportation charge will decrease because trollergyi and/or threshing machine on a small truck can come to the nearest place to the paddy farmland but diesel cost of the trollergyi or the small truck shall be considered from the previous threshing place to the nearest place to farmland.

Minimum transportation charge for this work is about 20,000 Kyats/ac and maximum is about 100,000 Kyats/ac according to interviews to famers. All works are usually done by farm labors. For summer paddy cultivation, transportation of this type is required because of poor road condition during harvesting time. Two irrigation systems located at southern part of the project area, i.e. Wegyi and Taung Nyo, require such transportation work because annual rain fall amount is heavier than that of other 2 irrigation systems.

**Table 1.2.14 Average Transportation Cost for Paddy with Straw from Farmland to Threshing Place**

Minimum Cost (acre)	Maximum Cost (acre)	Average Cost (acre)
20,000 kyats	100,000 kyats	60,000 kyat

Source: the Survey Team (2013)

**Table 1.2.15 Diesel consumption of Trollergyi / Small-medium truck for 1 mile**

Hp	Unit Consumption (lit/hr)	Speed (km/hr)	Consumption (lit/km)	Conversion (gal/lit)	(km / mile)	Consumption (gal/mile)
22	0.047	25.0	2.030	0.220	0.621	0.719

Source: the Survey Team (2013)

Present diesel price is about 4,000 Kyats/gallon. Transportation distance ranges from 0.2 mile to 2 miles or more, then average transportation distance of 1 way is calculated at 1.1 mile. At least 2 times of round trips are necessary for 1 acre harvest of paddy, and therefore total 4 ways of transportation are required. For threshing machine transportation by a small truck, it requires only 2 ways of transportation while trollergyi transportation requires 4 ways. In order to keep benefit safety side, reduction of transportation cost is omitted for threshing machine transportation.

**Table 1.2.16 Transportation Cost for Trollergyi from Track Loading Point to the nearest Place to Farmland**

Transportation distance (mile)	Number of Trips for transportation (times/acre)	Diesel Consumption (gal/mile)	Diesel Price (kyat/gal)	Transportation cost (kyat/acre)
1.1	4	0.067228401	4,000	1,183

Source: the Survey Team (2013)

Minimum cost for transportation is 20,000 Kyats per time, and transportation cost after upgrade is calculated as follows;

$$20,000 \text{ Kyats/ac} + 1,183 \text{ Kyats/ac} = 21,183 \text{ Kyats/ac}$$

In addition to harvesting, input transportation will also be benefited. According to interview to farmers, input materials such as chemical fertilizer, compost, and gypsum are used. Total weight of these materials is estimated at about 1.1 ton. Harvest of paddy is not more than 2 tons/ac (yield of 50 – 70 per acre is obtained by survey, the maximum yield 70 basket x 20.9 kg/basket = 1,463 ton/ac). With straw, it could be 4 tons/ac, and then about 25% (1.1ton/4ton) of benefit of paddy transportation can be estimated as material input transportation benefit for monsoon paddy. In case of summer paddy, road condition is not so bad for material transportation, thus there would be no benefit for this works.

**Table 1.2.17 Benefit of Road Upgrade for Summer Paddy (4 Irrigation Systems)**

Items	Amount (Kyats)
Labor cost for paddy transportation before upgrade	60,000
Labor and trollergyi cost for paddy transportation after upgrade	21,183
Expected benefit	38,817

Source: the Survey Team (2013)

**Table 1.2.18 Benefit of Road Upgrade for Monsoon Paddy (Wegyi and Taung Nyo irrigation systems)**

Items	Amount (Kyats)
Labor cost for paddy transportation before upgrade	60,000
Labor and trollergyi cost for paddy transportation after upgrade	21,183
Expected benefit for paddy transportation after upgrade	38,817
Estimated cost reduction for input material transportation (38,817x0.25)	9,704
Total benefit after road upgrade	48,521

Source: the Survey Team (2013)

Based on benefits examined above, following table summarizes the benefit for paddy and material transportation;

**Table 1.2.19 Summary of Benefit for Paddy Transportation from Farmland to Threshing Place**

Crops	Irrigation System	Items	1st Year	2nd Year	3rd Year
Monsoon Paddy	Wegyi	Sown Area (ac)	19,455.36	10,096.25	10,876.81
		Unit Benefit (kt/ac)	48,521	48,521	48,521
		Benefit (kt)	943,993,522	489,880,146	527,753,698
	Taung Nyo	Sown Area (ac)	16,611.77	18,988.74	14,380.80
		Unit Benefit (kt/ac)	48,521	48,521	48,521
		Benefit (kt)	806,019,692	921,352,654	697,770,797
	Sub-total			1,750,013,215	1,411,232,800
Summer Paddy	North Nawin	Sown Area (ac)	6,804.39	2,592.95	0.00
		Unit Benefit (kt/ac)	38,817	38,817	38,817
		Benefit (kt)	264,126,007	100,650,540	0
	South Nawin	Sown Area (ac)	5,718.37	1,096.21	0.00
		Unit Benefit (kt/ac)	38,817	38,817	38,817
		Benefit (kt)	221,969,968	42,551,584	0
	Wegyi	Sown Area (ac)	772.64	5,420.55	10,441.55
		Unit Benefit (kt/ac)	38,817	38,817	38,817
		Benefit (kt)	29,991,567	210,409,489	405,309,646
	Taung Nyo	Sown Area (ac)	1,324.97	2,589.96	724.98
		Unit Benefit (kt/ac)	38,817	38,817	38,817
		Benefit (kt)	51,431,360	100,534,477	28,141,549
	Sub-total			567,518,902	454,146,090
Total (kyat)			2,317,532,116	1,865,378,890	1,658,975,690
Grand Total (kyat)					5,841,886,696

Source: the Survey Team (2013)

**c) Total Benefit**

Based on the calculation aforementioned, benefit by road upgrade is summarized as follows. As is shown in the table, total benefit for road upgrade will arrive at 6.3 billion Kyats.

**Table 1.2.20 Summary of Benefit by Road Upgrade for all Irrigation Systems**

Work Types	Crops	Irrigation System	1st Year benefit (kyat)	2nd Year benefit (kyat)	3rd Year benefit (kyat)	Total (kyat)	
Village to mid-point	Monsoon Paddy	North Nawin	15,583,361	14,350,527	0	29,933,888	
		South Nawin	15,137,004	13,483,625	61,571,735	90,192,364	
		Wegyi	10,953,368	5,684,189	30,618,220	47,255,777	
		Taung Nyo	9,352,427	10,690,661	40,481,952	60,525,040	
		Sub-total	51,026,160	44,209,002	132,671,907	227,907,069	
	Summer Paddy	North Nawin	3,830,872	1,459,831	0	5,290,703	
		South Nawin	3,219,442	617,166	0	3,836,608	
		Wegyi	434,996	3,051,770	5,878,593	9,365,359	
		Taung Nyo	745,958	1,458,147	408,164	2,612,269	
		Sub-total	8,231,268	6,586,914	6,286,757	21,104,939	
	Black Gram	North Nawin	16,291,373	24,261,517	0	40,552,890	
		South Nawin	31,787,708	28,315,612	25,860,129	85,963,449	
			Wegyi	21,557,432	6,172,977	3,458,976	31,189,385
			Taung Nyo	19,640,096	22,450,387	17,002,420	59,092,903
Sub-total			89,276,609	81,200,493	46,321,525	216,798,627	
Total			148,534,037	131,996,409	185,280,189	465,810,635	
Harvest and material transportation	Monsoon Paddy	Wegyi	943,993,522	489,880,146	527,753,698	1,961,627,366	
		Taung Nyo	806,019,692	921,352,654	697,770,797	2,425,143,143	
		Sub-total	1,750,013,214	1,411,232,800	1,225,524,495	4,386,770,509	
	Summer Paddy	North Nawin	264,126,007	100,650,540	0	364,776,547	
		South Nawin	221,969,968	42,551,584	0	264,521,552	
		Wegyi	29,991,567	210,409,489	405,309,646	645,710,702	
		Taung Nyo	51,431,360	100,534,477	28,141,549	180,107,386	
		Sub-total	567,518,902	454,146,090	433,451,195	1,455,116,187	
	Total			2,317,532,116	1,865,378,890	1,658,975,690	5,841,886,696
	Grand Total			2,466,066,153	1,997,375,299	1,844,255,879	6,307,697,331

Source: the Survey Team (2013)



### **1.3 Cases for Sensitivity Analysis**

Aside from above basic cases, there should be a sensitivity analysis to know to what extent the project variability is affected by such factors as hike of construction cost, reduction of benefit, delay of construction schedule whereby delaying the benefit to take place, etc. Table 5.2.2 shows the cases of sensitivity analysis where total 5 cases are to be examined against a base case, which is Base 1 where the benefits from area expansion of black gram and road improvement are taken into account. The 5 cases are; cost increase by 10%, benefit reduction by -10%, cost increase together with benefit reduction of each 10%, construction delayed by 2 years, and increase of O & M cost to 3% from the base 0.3% of the initial investment cost:

### **1.4 Result of the Project Evaluation**

Table 2.2.3 shows the results of the economic analysis; EIRR shows up over 15% in all the cases including the Base 0 where only area expansion of black gram is counted as the project benefit. By case, the minimum EIRR shows up in Base 0 as 19.4%, and then Base 1 shows 22.2% up by 2.8% from the Base 0 by undertaking the benefit from road improvement. By considering the remaining value of procured machineries, not much hike in EIRR takes place as indicated in Case Base 2, only 0.7% top up on the Base 1.

**Table1.4.1 Case for Sensitivity Analysis (Conditions)**

Case	Cost	Benefit	Base Cost and Benefit	Remarks
SA 1 (C+10%)	+10% of Base 1	No change from Base 1	Base 1	O&M Cost: 0.3%
SA 2 (B-10%)	No Change from Base 1	-10% of Base 1	Base 1	O&M Cost: 0.3%
SA 3 (C+10B-10)	+10% of Base 1	-10% of Base 1	Base 1	O&M Cost: 0.3%
SA 4 (+2years)	Construction completion delayed by 2 years		Base 1	O&M Cost: 0.3%
SA 5 (O&M Cost up)	Increase of O&M Cost: 3% of direct construction cost		Base 1	

**Table1.4.2 Summary of Case Study (Project Evaluation)**

Case	Economic analysis			Financial Analysis		
	EIRR	NPV (Million Kyat)	B/C	EIRR	NPV (Million Kyat)	B/C
Base0	19.4%	48,894	1.48	12.7%	4,948	1.04
Base1	22.2%	67,176	1.66	15.3%	24,089	1.22
Base2	22.9%	71,016	1.72	15.9%	27,797	1.26
Base3 (Ext. Service)	22.8%	78,645	1.73	17.0%	38,299	1.34
Base4 (Road Only)	32.6%	11,100	2.42	32.9%	11,290	2.45

## **CHAPTER 2 FARM BUDGET ANALYSIS: INCOME INCREASE PER FARMER HOUSEHOLD WITH PROJECT**

Above discussion centered on the project economic justification from the view point of what extent the project contributes to in the national economy. As concluded, the Project was justified by showing high return of investment, higher than the opportunity cost of 12-15% applied in most of developing countries. Here in this section, the extent of how the project benefits in the beneficiary's income is explored by comparing the net income between the present (without-project) and the after the project has been completed (with-project).

To explore the change with project at the level of farmer household, we should establish a model farmer's farm budget. To know the model farm budget, a typical average farmer's agricultural income should be estimated. In the project economic analysis as discussed before, current net agricultural benefit and the benefit with project (both in financial term) have been estimated at the level of irrigation system, and the present and with-project benefits can further be calculated by the location where the farmers do farming such as upstream, midstream and downstream.

The upper part of Table 2.1.1 summarizes the net benefits without- and with-projects, which are shown by irrigation system and further by location. As for the number of farmer households, there is no data available. However, a sample household survey conducted by JICA team, which had covered 225 households, has made out the area of farmlands of the sampled farm households. Dividing the irrigation scheme's irrigable area by the farmland area, already averaged by scheme and by location, we can estimate the number of famers (see the mid part of Table 2.1.1).

With the estimated number of famers by system and by location, a typical average famer's benefit can now be calculated by dividing the net benefits for with- and without-projects with the number of farmers. The results are summarized in the bottom part of Table 2.1.1. As shown, a typical average farmer at present, namely without project, fetches net income ranging from 1.2 million Kyats (downstream of South Nawin) to 3 million Kyats (midstream of North Nawin) with an overall average net income of 1.88 million Kyats.

The net income of 'with-project' would increase to a range of 1.7 million Kyats (upstream of Wegyi) to as much as 5.8 million Kyats (midstream of North Nawin) with an overall average net income of 2.81 million Kyats. It is by percentage concluded that the net income per farmer household would increase by 104% (Wegyi) to as much as 184% (South Nawin) by irrigation system with an overall increase of 150%. With the project, overall farmer's income would therefore increase by 1.5 times, presenting a great impact on the beneficiary farmers' income

**Table 2.1.1 Farm Budget Analysis (Farm Net Benefit Increase per Farmer)**

Particular	N. Nawin	S. Nawin	Wegyi	T. Nyo	Total
Net Benefit without Project (Kyats)	9,382,466,365	12,602,248,547	11,294,887,739	10,611,688,279	43,891,290,930
Upstream Benefit (Kyats)	5,086,780,059	5,858,977,188	5,497,082,916	3,693,616,741	20,136,456,904
Midstream Benefit (Kyats)	4,295,686,306	3,139,858,430	2,773,005,601	4,331,450,892	14,540,001,229
Downstream Benefit (Kyats)	0	3,603,412,929	3,024,799,222	2,586,620,646	9,214,832,797
Net Benefit with Project (Kyats)	14,982,533,756	23,136,984,480	11,735,472,055	15,992,839,829	65,847,830,120
Upstream Benefit (Kyats)	6,869,877,048	8,939,575,277	5,893,990,715	5,286,424,648	26,989,867,688
Midstream Benefit (Kyats)	8,112,656,708	8,707,962,035	2,773,005,601	7,018,052,940	26,611,677,284
Downstream Benefit (Kyats)	0	5,489,447,168	3,068,475,739	3,688,362,241	12,246,285,148
Net Irrigable Area (acre) 1/	53,168.54	72,708.66	40,428.42	49,981.31	216,286.93
Upstream Area (acre)	27,679.15	26,886.33	19,455.36	16,611.77	90,632.61
Midstream Area (acre)	25,489.39	23,949.60	10,096.25	18,988.74	78,523.98
Downstream Area (acre)	0	21,872.73	10,876.81	14,380.80	47,130.34
Average Farmland (acre/FHH 2/	12.72	8.28	8.01	9.28	9.91
Upstream Area (acre/FHH)	9.90	8.22	5.50	11.48	8.89
Midstream Area (acre/FHH)	18.23	9.30	9.37	8.15	12.06
Downstream Area (acre/FHH)	10.03	7.31	9.17	8.22	8.77
No. of FHHs	4,180	8,781	5,047	5,386	23,394
No. of FHHs (upstream)	2,796	3,271	3,537	1,447	11,051
No. of FHHs (midstream)	1,398	2,575	1,078	2,330	7,381
No. of FHHs (downstream)	0	2,992	1,186	1,749	5,928
<b>Per Farmer Household</b>	<b>N. Nawin</b>	<b>S. Nawin</b>	<b>Wegyi</b>	<b>T. Nyo</b>	<b>Total</b>
Net Benefit without Project (Kyats/FHH)	2,244,654	1,435,133	2,237,833	1,970,266	1,876,152
Upstream Benefit (Kyats/FHH)	1,819,388	1,791,274	1,554,017	2,552,571	1,822,127
Midstream Benefit (Kyats/FHH)	3,072,273	1,219,256	2,573,536	1,859,066	1,969,963
Downstream Benefit (Kyats/FHH)	NA	1,204,283	2,550,142	1,478,501	1,554,516
Net Benefit with Project (Kyats/FHH)	3,584,410	2,634,820	2,325,125	2,969,381	2,814,694
Upstream Benefit (Kyats/FHH)	2,457,149	2,733,110	1,666,222	3,653,323	2,442,285
Midstream Benefit (Kyats/FHH)	5,802,168	3,381,436	2,573,536	3,012,160	3,605,502
Downstream Benefit (Kyats/FHH)	NA	1,834,607	2,586,965	2,108,251	2,065,913
Ratio b/t with & without Project (%)	160	184	104	151	150
Upstream Area (%)	135	153	107	143	134
Midstream Area (%)	189	277	100	162	183
Downstream Area (%)	NA	152	101	143	133

Note: the downstream area of North Nawin is supplied with irrigation water by South Nawin irrigation system, and therefore the downstream area of North Nawin is counted at Nil producing no benefit therein but counted in the benefits of South Nawin.

Source: 1/Irrigation Department, 2/ Sample Survey (225 households), JICA

## TABLES OF PROJECT EVALUATION

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**Table 3.1.1 Project COST Estimation (Financial / Economic)-Base 0**

	2014年				2015年				2016年				2017年				2018年					
	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic		
	FC	LC			FC	LC			FC	LC			FC	LC			FC	LC				
<b>North Nawm</b>	540,492		0.99	540,492	2,317,826		1.00	2,317,824	935,000		1.00	932,100										
LC	Total	6526,687		6,107,801	1,937,249		1.00	1,619,106	667,713		0.99	644,482										
	Material	1,293,000		1,279,080	3,338		0.99	3,338	669,439		0.99	664,751										
	Skilled Labor	2,019,570		2,019,570	467,079		1.00	467,079	298,330		1.00	298,330										
	Unskilled Labor	3,014,117		1,808,841	456,252		0.60	418,997	299,943		0.60	179,403										
<b>South Nawm</b>	1,492,202		1.00	1,492,202	4,309,837		1.00	4,309,837	4,599,260		1.00	4,169,261										
LC	Total	1,546,420		1,593,830	3,444,566		0.99	2,986,125	1,886,141		0.99	1,844,820										
	Material	311,220		308,173	1,791,113		0.99	1,781,518	1,752,242		0.99	1,744,820										
	Skilled Labor	414,491		414,491	240,047		1.00	240,047	849,095		1.00	849,095										
	Unskilled Labor	814,645		371,166	4,309,981		0.60	663,625	1,268,197		0.60	769,918										
<b>Wegy</b>								9,941,794		1.00	9,941,794	8,798,769		1.00	8,499,769	7,449,172		1.00	7,449,172			
LC	Total							8,576,719		0.99	8,499,769	7,449,172		0.99	7,449,172	6,845,961		0.99	6,845,961			
	Material							2,512,046		0.99	2,497,046	2,497,046		0.99	2,497,046	2,497,046		0.99	2,497,046			
	Skilled Labor							2,176,689		1.00	2,176,689	1,117,091		1.00	1,117,091	809,251		1.00	809,251			
	Unskilled Labor							7,344,750		0.60	6,949,274	6,677,300		0.60	6,677,300	4,465,065		0.60	4,465,065			
<b>Taung Myo</b>							4,825,500		1.00	4,825,500	3,886,708		1.00	3,886,708	3,122,676		1.00	3,122,676				
LC	Total							3,327,821		0.99	3,164,679	4,353,586		0.99	4,369,847	2,781,795		0.99	2,679,599			
	Material							2,090,121		0.99	2,078,347	1,651,819		0.99	1,649,427	1,810,665		0.99	1,820,715			
	Skilled Labor							411,040		1.00	411,040	189,129		1.00	189,129	178,165		1.00	178,165			
	Unskilled Labor							855,372		0.60	813,233	692,125		0.60	638,692	792,825		0.60	638,692			
<b>Sub-Total(FC+LC)</b>	7,562,794	7,873,937		11,661,421	9,567,962		5,822,917	11,204,741	20,285,949		14,832,442	34,816,727	10,919,069		24,433,223	11,171,848		8,149,559		8,482,791		
<b>Machinery Procurement</b>	5,944,204		1.00	5,944,204	4,871,309		1.00	4,871,309														
<b>Engineering Service</b>																						
Engineering Service (DG)					2,838,040		1.00	2,838,040														
Engineering Service (SY)					1,442,140		1.00	1,442,140	1,442,140		1.00	1,442,140	1,442,140		1.00	1,442,140	1,442,140		1.00	1,442,140		
<b>Sub-Total</b>	11,176,998	11,857,937		19,786,629	19,419,348		6,557,251	21,653,839	21,137,737		11,346,132	36,338,648	12,916,491		11,213,750	22,864,158		12,513,988		8,461,291		
<b>Physical Contingency</b>	5%	658,850	380,652		918,951	970,957,400		221,672,200	1,082,746,950		1,011,889,126	875,301,600		1,811,932,000	181,930,826	96,624		1,393,207	615,699,480	423,169,590		395,715,400
<b>Project Management (FC+LC)</b>	10%	124,279	587,394		1,366,443	656,795,200		138,211,200	1,120,474,300		2,029,984,500	1,683,244,200		3,480,672,700	1,411,647,700	1,091,938		1,443,122	1,117,184,800	508,950,000		1,448,229,200
<b>Sub-Total</b>	11,462,127	13,255,993		21,921,603	20,946,871,600		7,149,986,100	23,828,425	24,598,239		19,688,704	41,531,147	1,780,195,259	1,286,660		29,400,487	14,046,872,200	6,369,912,100		12,759,540		
<b>Grand-Total(FC+LC)</b>		13,918,120			28,066,261				44,127,945			38,713,848						23,746,285				
<b>O&amp;M</b>	7.5%				39,531	23,419		18,725,387	97,788,138		43,119,603	123,700,794	162,001,793		94,718,019	22,418,621		108,957,644	128,257,289		310,089,033	

Table 3.1.2 Project Cost and Benefit Estimation -Base 0

Particulars	FC/LC	Total	Ratio %	2014	2015	2016	2017	2018	2019	2020	Remarks
<b>Implementation</b>											
<b>1 Civil &amp; Structure Construction</b>											
1.1 North Nawin	FC	8,853,517,000	49	5,670,592,000	2,257,825,000	925,100,000					
	LC	9,131,937,000	51	6,326,617,000	1,937,549,000	867,771,000					
	(unskilled labors)	4,012,079,000	44	3,014,741,000	698,325,000	299,013,000					
	Sub Total (FC+LC)	17,985,454,000	100	11,997,209,000	4,195,374,000	1,792,871,000	0				
1.2 South Nawin	FC	10,471,300,000	54	1,592,202,000	4,309,837,000	4,569,261,000					
	LC	8,871,117,000	46	1,546,420,000	3,444,566,000	3,880,131,000					
	(unskilled labors)	2,992,881,000	34	618,643,000	1,106,041,000	1,268,197,000					
	Sub Total (FC+LC)	19,342,417,000	100	3,138,622,000	7,754,403,000	8,449,392,000	0				
1.3 Wegyi	FC	25,984,725,000	56			9,945,784,000	8,589,769,000	7,449,172,000			
	LC	20,352,398,000	44			8,576,719,000	6,387,854,000	5,387,825,000			
	(unskilled labors)	6,379,155,000	31			3,248,790,000	1,667,300,000	1,463,065,000			
	Sub Total (FC+LC)	46,337,123,000	100			18,522,503,000	14,977,623,000	12,836,997,000			
1.4 Taung Nyo	FC	14,464,884,000	57			4,855,500,000	5,886,708,000	3,722,676,000			
	LC	10,841,082,000	43			3,527,821,000	4,531,506,000	2,781,755,000			
	(unskilled labors)	2,348,591,000	22			855,372,000	928,794,000	564,425,000			
	Sub Total (FC+LC)	25,305,966,000	100			8,383,321,000	10,418,214,000	6,504,431,000			
<b>Total of Civil &amp; Structure Construction</b>	FC	59,774,426,000	55	7,262,794,000	6,567,662,000	20,295,645,000	14,476,477,000	11,171,848,000			
	LC	49,196,534,000	45	7,873,037,000	5,382,115,000	16,852,442,000	10,919,360,000	8,169,580,000			
	(unskilled labors)	15,732,706,000	32	3,633,384,000	1,804,366,000	5,671,372,000	2,596,094,000	2,027,490,000			
	<b>Total (FC+LC)</b>	<b>108,970,960,000</b>	<b>100</b>	<b>15,135,831,000</b>	<b>11,949,777,000</b>	<b>37,148,087,000</b>	<b>25,395,837,000</b>	<b>19,341,428,000</b>			
<b>2 Machineries Procurement</b>	FC	14,785,510,000	99	5,914,204,000	8,871,306,000						
	LC	147,855,100	1		147,855,100						
	<b>Total (FC+LC)</b>	<b>14,933,365,100</b>	<b>100</b>	<b>5,914,204,000</b>	<b>9,019,161,100</b>	<b>0</b>	<b>0</b>				
<b>5 Engineering Service</b>		0									
5.1 Engineering Service (DD)	FC	2,838,040,000	80		2,838,040,000						
	LC	729,824,000	20		729,824,000						
	<b>Total (FC+LC)</b>	<b>3,567,864,000</b>	<b>100</b>		<b>3,567,864,000</b>	<b>0</b>	<b>0</b>				
5.2 Engineering Service (SV)	FC	4,326,290,000	80		1,142,140,000	1,142,140,000	1,142,140,000	899,870,000			
	LC	1,112,540,000	20		293,710,000	293,710,000	293,710,000	231,410,000			
	<b>Total (FC+LC)</b>	<b>5,438,830,000</b>	<b>100</b>		<b>1,435,850,000</b>	<b>1,435,850,000</b>	<b>1,435,850,000</b>	<b>1,131,280,000</b>			
<b>1.1 Total of 1.2.5 (FC)</b>	FC	81,724,266,000	61	13,176,998,000	19,419,148,000	21,437,785,000	15,618,617,000	12,071,718,000			
<b>1.2 Total of 1.2.5 (LC)</b>	LC	51,186,753,100	39	7,873,037,000	6,553,504,100	17,146,152,000	11,213,070,000	8,400,990,000			
<b>1.3 Total of 1.2.5 (Unskilled Labors)</b>	(unskilled labors)	15,732,706,000	31	3,633,384,000	1,804,366,000	5,671,372,000	2,596,094,000	2,027,490,000			
<b>1.4 Total of 1.2.5 (Grand Total)</b>	<b>Total (FC+LC)</b>	<b>132,911,019,100</b>	<b>100</b>	<b>21,050,035,000</b>	<b>25,972,652,100</b>	<b>38,583,937,000</b>	<b>26,831,687,000</b>	<b>20,472,708,000</b>			
2.1 Physical Contingency (5% of 1.1)	5% FC	4,086,213,300	61	658,849,900	970,957,400	1,071,889,250	780,930,850	603,585,900			
2.2 Physical Contingency (5% of 1.2)	5% LC	2,559,337,655	39	393,651,850	327,675,205	857,307,600	560,653,500	420,049,500			
2.3 Physical Contingency (5% of 1.3)	5% (unskilled labors)	786,635,300	31	181,669,200	90,218,300	283,568,600	129,804,700	101,374,500			
2.4 Physical Contingency (5% of 1.4)	5% Total (FC+LC)	6,645,550,955	100	1,052,501,750	1,298,632,605	1,929,196,850	1,341,584,350	1,023,635,400			
<b>3.1 Total of 1.1 &amp; 2.1</b>	FC	85,810,479,300	61	13,835,847,900	20,390,105,400	22,509,674,250	16,399,547,850	12,675,303,900			
<b>3.2 Total of 1.1 &amp; 2.2</b>	LC	53,746,090,755	39	8,266,688,850	6,881,179,305	18,003,459,600	11,773,723,500	8,821,039,500			
<b>3.3 Total of 1.1 &amp; 2.3</b>	(unskilled labors)	16,519,341,300	31	3,815,053,200	1,894,584,300	5,954,940,600	2,725,898,700	2,128,864,500			
<b>3.4 Total of 1.1 &amp; 2.4</b>	<b>Total (FC+LC)</b>	<b>139,556,570,055</b>	<b>100</b>	<b>22,102,536,750</b>	<b>27,271,284,705</b>	<b>40,513,133,850</b>	<b>28,173,271,350</b>	<b>21,496,343,400</b>			
4. Project Management (10% of 1)	10% LC	10,897,096,000	100	1,513,583,100	1,194,977,700	3,714,808,700	2,539,583,700	1,934,142,800			
5. Others (Miscellaneous, 5% of 1-2)	5% LC	5,744,258,200	100	1,052,501,750	597,488,850	1,857,404,350	1,269,791,850	967,071,400			
<b>6.1 Grand Total Cost for Project Evaluation</b>	FC	85,810,479,300	55	13,835,847,900	20,390,105,400	22,509,674,250	16,399,547,850	12,675,303,900			
<b>6.2 Grand Total Cost for Project Evaluation</b>	LC	70,387,444,955	45	10,832,773,700	8,673,645,855	23,575,672,650	15,583,099,050	11,722,253,700			
<b>6.3 Grand Total Cost for Project Evaluation</b>	<b>Total (FC+LC)</b>	<b>156,197,924,255</b>	<b>100</b>	<b>24,668,621,600</b>	<b>29,063,751,255</b>	<b>46,085,346,900</b>	<b>31,982,646,900</b>	<b>24,397,557,600</b>			
<b>7. Operation and Maintenance</b>	0.30% LC				63,150,105	126,056,919	237,501,180	313,688,691	371,712,975		371,712,975





Table 3.1.3 Project Benefit Estimation -Base 0

x	2015			2016			2017			2018			2019		
	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic
1. Agriculture Production															
1.1 North Nawin															
1.1.1 Black Gram															
(a) Increase of Sawn Area (ac)	10,192.16		10,192	15,178.42		15,178.42	0	0.00	0	0	0.00	0	0	0.00	0
(b) Gross Profit (Ktac)	328,000	1.07	350,960	328,000	1.07	350,960									
(c) Input Cost (ktac)	37,086	0.77	28,556	37,086	0.77	28,556									
(d) Family Labor (ktac)	28,258	0.60	16,955	28,258	0.60	16,955									
(e) Hired Labor (ktac)	36,535	0.60	21,921	39,441	0.60	23,665									
(f) Unit Net Profit (ktac)	226,121		283,528	223,215		281,784									
(g) Net Profit (Kt)	2,304,661,411		2,889,717,376	3,388,051,020		4,277,035,901									
(h) Accumulated Net Profit (Kt)	2,304,661,411		2,889,717,376	5,692,712,431		7,166,753,277	5,692,712,431		7,166,753,277	5,692,712,431		7,166,753,277	5,692,712,431		7,166,753,277
1.2 South Nawin															
1.2.1 Black Gram															
(a) Increase of Sawn Area (ac)	17,608.66		17,608.66	22,141.91		22,141.91	18,705.22		18,705.22	0	0.00	0	0	0.00	0
(b) Gross Profit (Ktac)	250,167	1.07	267,679	250,167	1.07	267,679	250,167	1.07	267,679						
(c) Input Cost (ktac)	38,684	0.77	29,787	38,684	0.77	29,787	38,684	0.77	29,787						
(d) Family Labor (ktac)	26,176	0.60	15,706	26,176	0.60	15,706	26,176	0.60	15,706						
(e) Hired Labor (ktac)	36,535	0.60	21,921	36,535	0.60	21,921	36,535	0.60	21,921						
(f) Unit Net Profit (ktac)	148,772		200,265	148,772		200,265	148,772		200,265						
(g) Net Profit (Kt)	2,619,675,566		3,526,398,295	3,294,096,235		4,434,249,606	2,782,812,990		3,746,000,883						
(h) Accumulated Net Profit (Kt)	2,619,675,566		3,526,398,295	5,913,771,801		7,960,647,901	8,696,584,791		11,706,648,784	8,696,584,791		11,706,648,784	8,696,584,791		11,706,648,784
1.3 Wegyi															
1.3.1 Black Gram															
(a) Increase of Sawn Area (ac)							2,268.72		2,268.72	0.00		0.00	433.17		433.17
(b) Gross Profit (Ktac)							250,167	1.07	267,679	328,000	1.07	350,960	153,494	1.07	164,239
(c) Input Cost (ktac)							38,684.00	0.77	29,787	37,086	0.77	28,556	15,476	0.77	11,917
(d) Family Labor (ktac)							26,176	0.60	15,706	28,258	0.60	16,955	26,644	0.60	15,986
(e) Hired Labor (ktac)							36,535.00	0.60	21,921	39,441	0.60	23,665	37,188	0.60	22,313
(f) Unit Net Profit (ktac)							148,772		200,265	223,215		281,784	74,186		114,023
(g) Net Profit (Kt)							337,522,012		454,345,211	0		32,135,150	49,391,343		49,391,343
(h) Accumulated Net Profit (Kt)							337,522,012		454,345,211	337,522,012		454,345,211	369,657,162		503,736,554
1.4 Taung Nyo															
1.4.1 Black Gram															
(a) Increase of Sawn Area (ac)							9,104.47		9,104.47	10,683.44		10,683.44	0.00		0.00
(b) Gross Profit (Ktac)							250,167	1.07	267,679	328,000	1.07	350,960	0	1.07	0
(c) Input Cost (ktac)							38,684	0.77	29,787	37,086	0.77	28,556	0	0.77	0
(d) Family Labor (ktac)							26,176	0.60	15,706	28,258	0.60	16,955	0	0.60	0
(e) Hired Labor (ktac)							36,535	0.60	21,921	39,441	0.60	23,665	0	0.60	0
(f) Unit Net Profit (ktac)							148,772		200,265	223,215		281,784	0		0
(g) Net Profit (Kt)							1,354,490,211		1,823,306,685	2,384,704,060		3,010,422,457	0		0
(h) Accumulated Net Profit (Kt)							1,354,490,211		1,823,306,685	3,739,194,271		4,833,729,142	3,739,194,271		4,833,729,142
Sub-Total (Base Case, Financial)	4,924,336,977		6,416,115,671	11,606,484,232		15,127,401,178	16,081,309,445		21,151,053,957	18,466,013,505		24,161,476,414	18,498,148,655		24,210,867,757
G-Tota	4,924,336,977		6,416,115,671	11,606,484,232		15,127,401,178	16,081,309,445		21,151,053,957	18,466,013,505		24,161,476,414	18,498,148,655		24,210,867,757



Table 3.1.4 Financial Cost and Benefit Analyses (Base0)

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	FIRR =		12.7%		B/C =		1.04	
						Present Value Factor	Present Value		Present Value	Present Value			
							Discount Rate	12.7%		Discount Rate	12.0%		
	Investment	O & M	Total	Total		Cost	Benefit	Cost	Benefit		Cost	Benefit	
1	23,616,120,000		23,616,120,000	0	-23,616,120,000	0.88731	20,954,819,437	0	0.89286	21,085,888,903	0		
2	28,466,262,000	63,150,000	28,529,412,000	4,924,336,977	-23,605,075,023	0.78732	22,461,776,656	3,877,028,989	0.79719	22,743,361,952	3,925,632,195		
3	44,227,943,000	141,068,061	44,369,011,061	11,606,484,232	-32,762,526,829	0.69860	30,996,191,127	8,108,289,884	0.71178	31,580,974,693	8,261,263,347		
4	30,712,856,000	256,819,872	30,969,675,872	16,081,309,445	-14,888,366,427	0.61988	19,197,482,680	9,968,482,099	0.63552	19,681,848,410	10,219,993,778		
5	23,750,285,000	337,314,933	24,087,599,933	18,466,013,505	-5,621,586,428	0.55002	13,248,661,715	10,156,676,748	0.56743	13,668,026,830	10,478,170,043		
6		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.48804	164,623,180	9,027,836,470	0.50663	170,893,865	9,371,717,053		
7		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.43304	146,070,859	8,010,438,294	0.45235	152,584,410	8,367,637,544		
8		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.38425	129,613,263	7,107,913,621	0.40388	136,234,755	7,471,032,279		
9		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.34095	115,007,526	6,306,943,784	0.36061	121,639,138	6,670,617,386		
10		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.30252	102,044,514	5,596,059,931	0.32197	108,605,289	5,955,848,922		
11		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.26843	90,545,447	4,965,458,043	0.28748	96,971,297	5,317,847,775		
12		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.23818	80,341,671	4,405,889,047	0.25668	86,581,997	4,748,104,797		
13		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.21134	71,288,138	3,909,398,737	0.22917	77,302,463	4,239,220,727		
14		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.18753	63,256,669	3,468,957,817	0.20462	69,021,382	3,785,091,178		
15		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.16640	56,129,205	3,078,091,936	0.18270	61,627,438	3,379,611,759		
16		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.14764	49,801,177	2,731,066,667	0.16312	55,022,812	3,017,418,009		
17		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.13101	44,191,629	2,423,442,455	0.14564	49,126,547	2,694,070,370		
18		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.11624	39,209,488	2,150,224,800	0.13004	43,864,434	2,405,499,251		
19		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.10314	34,790,662	1,907,899,052	0.11611	39,165,637	2,147,820,040		
20		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.09152	30,871,063	1,692,950,565	0.10367	34,969,439	1,917,703,071		
21		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.08121	27,393,346	1,502,234,652	0.09256	31,221,870	1,712,188,640		
22		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.07206	24,306,914	1,332,976,592	0.08264	27,875,706	1,528,687,005		
23		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.06394	21,567,917	1,182,771,625	0.07379	24,890,469	1,364,978,389		
24		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.05673	19,135,876	1,049,399,973	0.06588	22,222,308	1,218,658,033		
25		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.05034	16,980,434	931,196,803	0.05882	19,840,864	1,088,061,104		
26		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.04467	15,067,858	826,312,300	0.05252	17,715,780	971,522,767		
27		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.03963	13,367,791	733,081,631	0.04689	15,816,697	867,378,190		
28		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.03517	11,863,366	650,579,888	0.04187	14,123,376	774,517,484		
29		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.03120	10,524,226	577,142,238	0.03738	12,608,832	691,460,797		
30		337,314,933	337,314,933	18,498,148,655	18,160,833,722	0.02769	9,340,250	512,213,736	0.03338	11,259,572	617,468,202		
Total	150,773,466,000	9,231,226,191	160,004,692,191		353,527,168,343		108,246,264,084	108,190,958,377		110,261,287,165	115,209,220,135		
							NPV =	-55,305,707		NPV =	4,947,932,970		

Table 3.1.5 Economic Cost and Benefit Analyses -Base0

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	EIRR = Present Value Factor	19.4%		B/C = Present Value Factor	1.48	
							Present Value			Present Value	
	Investment	O & M	Total	Total			Discount Rate	19.4%		Discount Rate	12.0%
							Cost	Benefit		Cost	Benefit
1	21,924,003,000		21,924,003,000	0	-21,924,003,000	0.837520938	18,361,811,557	-	0.892857143	19,575,002,679	0
2	23,858,119,000	63,150,000	23,921,269,000	6,416,115,671	-17,505,153,329	0.701441322	16,779,366,542	4,500,528,656	0.797193878	19,069,889,190	5,114,888,131
3	41,531,145,000	141,068,061	41,672,213,061	15,127,401,178	-26,544,811,883	0.587471794	24,481,249,753	8,886,921,503	0.711780248	29,661,458,139	10,767,385,359
4	29,600,465,000	256,819,872	29,857,284,872	21,151,053,957	-8,706,230,915	0.492019928	14,690,379,144	10,406,740,038	0.635518078	18,974,844,308	13,441,877,167
5	22,759,543,000	337,314,933	23,096,857,933	24,161,476,414	1,064,618,481	0.412076991	9,517,683,727	9,956,388,508	0.567426856	13,105,777,474	13,709,870,591
6		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.345123108	116,415,178	8,355,729,936	0.506631121	170,894,243	12,265,979,076
7		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.289047829	97,500,149	6,998,098,774	0.452349215	152,584,145	10,951,767,033
8		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.242083609	81,658,416	5,861,054,249	0.403883228	136,235,844	9,778,363,422
9		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.202750091	68,390,634	4,908,755,653	0.360610025	121,639,146	8,730,681,627
10		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.169807447	57,278,588	4,111,185,639	0.321973237	108,606,381	7,795,251,452
11		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.142217292	47,972,016	3,443,204,053	0.287476104	96,969,983	6,960,045,940
12		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.11910996	40,177,568	2,883,755,488	0.256675093	86,580,342	6,214,326,732
13		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.099757085	33,649,555	2,415,205,601	0.22917419	77,303,877	5,548,506,011
14		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.083548648	28,182,207	2,022,785,261	0.204619813	69,021,318	4,954,023,224
15		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.069973742	23,603,188	1,694,125,009	0.182696261	61,626,177	4,423,235,021
16		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.058604474	19,768,164	1,418,865,167	0.163121662	55,023,372	3,949,316,983
17		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.049082474	16,556,251	1,188,329,285	0.145644341	49,128,011	3,526,175,878
18		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.0411076	13,866,207	995,250,658	0.13003959	43,864,296	3,148,371,320
19		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.034428475	11,613,239	833,543,264	0.116106777	39,164,550	2,811,045,821
20		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.028834569	9,726,331	698,109,937	0.10366677	34,968,350	2,509,862,459
21		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.024149555	8,146,006	584,681,689	0.09255961	31,221,739	2,240,948,477
22		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.020225758	6,822,450	489,683,157	0.08264251	27,876,553	2,000,846,881
23		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.016939496	5,713,945	410,119,897	0.07378796	24,889,781	1,786,470,542
24		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.014187183	4,785,549	343,484,001	0.06588210	22,223,016	1,595,062,811
25		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.011882062	4,007,997	287,675,042	0.05882331	19,841,981	1,424,163,379
26		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.009951476	3,356,781	240,933,871	0.05252081	17,716,054	1,271,574,385
27		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.00833457	2,811,375	201,787,162	0.04689358	15,817,905	1,135,334,264
28		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.006980377	2,354,585	169,000,973	0.04186927	14,123,130	1,013,691,359
29		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.005846212	1,972,014	141,541,854	0.03738327	12,609,935	905,081,406
30		337,314,933	337,314,933	24,210,867,757	23,873,552,824	0.004896325	1,651,603	118,544,266	0.03337792	11,258,871	808,108,407
Total	139,673,275,000	9,231,226,191	148,904,501,191	665,711,625,474	523,223,239,954	5	84,538,470,719	84,566,028,591		101,888,160,790	150,782,255,158
							NPV =	27,557,872		NPV =	48,894,094,368

Table 3.1.6 Project Cost Estimation (Financial / Economic)-Base1

	2014#				2015#				2016#				2017#				2018#			
	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic
	FC	LC			FC	LC			FC	LC			FC	LC			FC	LC		
North Nyaung	5,670,997		1.00	5,670,992	2,247,825		1.00	2,247,824	925,100		1.00	925,100								
LC	Total	6,136,617		6,136,781	1,971,549		1.00	1,971,549	951,771		1.00	951,771								
	Material	1,341,000		1,341,000	771,194		0.99	765,633	-50,410		0.99	364,135								
	Skilled Labor	3,014,271		2,915,876	467,713		1.00	467,578	280,119		1.00	300,239								
	Unskilled Labor	3,004,741		1,808,814	668,757		0.66	410,999	299,023		0.66	179,405								
South Nyaung	1,492,302		1,001,203	4,360,837		1.00	4,360,837	4,969,200		1.00	4,969,200									
LC	Total	1,546,520		1,393,210	3,441,286		1.00	3,441,286	3,580,131		1.00	3,580,131								
	Material	115,238		908,153	1,017,473		0.99	1,018,303	1,762,242		0.99	1,744,620								
	Skilled Labor	316,493		414,491	791,020		1.00	791,020	1,060,692		1.00	849,692								
	Unskilled Labor	616,643		171,196	1,060,041		0.66	962,622	1,268,197		0.66	760,918								
Wegyi								8,945,754		1.00	8,945,754	8,596,769		1.00	8,596,769	7,498,172		1.00	7,498,172	
LC	Total							8,576,719		0.98	8,195,738	6,884,839		0.99	6,884,839	5,287,825		0.99	5,287,825	
	Material							1,191,216		0.98	1,191,216	1,191,216		0.99	1,191,216	2,044,536		0.99	2,044,536	
	Skilled Labor							1,760,619		1.00	1,760,619	1,760,619		1.00	1,760,619	602,269		1.00	602,269	
	Unskilled Labor							3,245,799		0.66	1,984,212	1,863,346		0.66	1,000,000	1,462,855		0.66	877,839	
Taing Nyaung							4,655,500		1.00	4,655,500	5,896,708		1.00	5,896,708	3,723,676		1.00	3,723,676		
LC	Total							3,527,821		0.98	3,186,679	4,657,500		0.99	4,657,500	2,781,784		0.99	2,781,784	
	Material							2,595,919		0.98	2,078,337	1,582,716		0.99	1,582,716	1,018,987		0.99	1,018,987	
	Skilled Labor							470,699		1.00	470,699	751,667		1.00	751,667	373,365		1.00	373,365	
	Unskilled Labor							559,203		0.66	337,223	760,117		0.66	328,617	689,422		0.66	338,835	
Sub-Total(FC+LC)	7,362,794	7,873,027		13,667,425	9,367,662		1.00	11,304,343	20,295,649		1.00	18,652,442	34,069,527		1.00	31,478,477	18,949,399		1.00	18,482,295
Machinery Procurement	3,911,301		1.00	3,911,301	3,871,306		1.00	3,871,306												
Engineering Service																				
Engineering Service (DD)					3,838,046		1.00	3,838,046												
Engineering Service (S)					59,824		0.99	59,824												
Engineering Service (O)					1,142,140		1.00	1,142,140	1,142,140		1.00	1,142,140	1,142,140		1.00	1,142,140	1,142,140		1.00	1,142,140
					283,719		0.99	283,719												
Total	13,178,995	13,873,027		25,578,829	19,419,148		1.00	21,654,939	41,437,785		1.00	38,146,132	76,238,640		1.00	70,618,617	42,212,928		1.00	40,191,508
Physical Contingency	5%	658,549		689,652	905,857		1.00	905,857	1,081,766		1.00	1,081,766	1,311,920		1.00	1,311,920	1,589,400		1.00	1,887,710
Project Management (FC+LC)	10%	736,279		787,302	1,366,443		1.00	1,366,443	1,366,443		1.00	1,366,443	1,366,443		1.00	1,366,443	1,366,443		1.00	1,366,443
Sub-Total		14,573,823		15,353,383	21,681,448		1.00	23,927,142	43,885,988		1.00	40,584,341	80,927,003		1.00	73,357,080	45,951,771		1.00	42,441,661
Grand-Total(FC+LC)		15,232,646		16,142,766	23,048,596		1.00	25,294,284	47,271,973		1.00	42,172,682	82,249,006		1.00	74,734,160	47,313,548		1.00	43,848,154
OMR	0.3%				39,433		1.00	39,433	118,600		1.00	118,600	359,760		1.00	359,760	1,085,280		1.00	3,271,680

Table 3.1.7 Project Cost and Benefit Estimation -Base1

Particulars	FC/LC	Total	Ratio, %	2014	2015	2016	2017	2018	2019	2020	Remarks
<b>Implementation</b>											
<b>1 Civil &amp; Structure Construction</b>											
1.1 North Nawin	FC	8,853,517,000	49	5,670,592,000	2,257,825,000	925,100,000					
	LC	9,131,937,000	51	6,326,617,000	1,937,549,000	867,771,000					
	(unskilled labors)	4,012,079,000	44	3,014,741,000	698,325,000	299,013,000					
	Sub Total (FC+LC)	17,985,454,000	100	11,997,209,000	4,195,374,000	1,792,871,000	0				
1.2 South Nawin	FC	10,471,300,000	54	1,592,202,000	4,309,837,000	4,569,261,000					
	LC	8,871,117,000	46	1,546,420,000	3,444,566,000	3,880,131,000					
	(unskilled labors)	2,992,881,000	34	618,643,000	1,106,041,000	1,268,197,000					
	Sub Total (FC+LC)	19,342,417,000	100	3,138,622,000	7,754,403,000	8,449,392,000	0				
1.3 Wegyi	FC	25,984,725,000	56			9,945,784,000	8,589,769,000	7,449,172,000			
	LC	20,352,398,000	44			8,576,719,000	6,387,854,000	5,387,825,000			
	(unskilled labors)	6,379,155,000	31			3,248,790,000	1,667,300,000	1,463,065,000			
	Sub Total (FC+LC)	46,337,123,000	100			18,522,503,000	14,977,623,000	12,836,997,000			
1.4 Taung Nyo	FC	14,464,884,000	57			4,855,500,000	5,886,708,000	3,722,676,000			
	LC	10,841,082,000	43			3,527,821,000	4,531,506,000	2,781,755,000			
	(unskilled labors)	2,348,591,000	22			855,372,000	928,794,000	564,425,000			
	Sub Total (FC+LC)	25,305,966,000	100			8,383,321,000	10,418,214,000	6,504,431,000			
<b>Total of Civil &amp; Structure Construction</b>	FC	59,774,426,000	55	7,262,794,000	6,567,662,000	20,295,645,000	14,476,477,000	11,171,848,000			
	LC	49,196,534,000	45	7,873,037,000	5,382,115,000	16,852,442,000	10,919,360,000	8,169,580,000			
	(unskilled labors)	15,732,706,000	32	3,633,384,000	1,804,366,000	5,671,372,000	2,596,094,000	2,027,490,000			
	<b>Total (FC+LC)</b>	<b>108,970,960,000</b>	<b>100</b>	<b>15,135,831,000</b>	<b>11,949,777,000</b>	<b>37,148,087,000</b>	<b>25,395,837,000</b>	<b>19,341,428,000</b>			
<b>2 Machineries Procurement</b>	FC	14,785,510,000	99	5,914,204,000	8,871,306,000						
	LC	147,855,100	1		147,855,100						
	<b>Total (FC+LC)</b>	<b>14,933,365,100</b>	<b>100</b>	<b>5,914,204,000</b>	<b>9,019,161,100</b>	<b>0</b>	<b>0</b>				
<b>5 Engineering Service</b>		0									
5.1 Engineering Service (DD)	FC	2,838,040,000	80		2,838,040,000						
	LC	729,824,000	20		729,824,000						
	<b>Total (FC+LC)</b>	<b>3,567,864,000</b>	<b>100</b>		<b>3,567,864,000</b>	<b>0</b>	<b>0</b>				
5.2 Engineering Service (SV)	FC	4,326,290,000	80		1,142,140,000	1,142,140,000	1,142,140,000	899,870,000			
	LC	1,112,540,000	20		293,710,000	293,710,000	293,710,000	231,410,000			
	<b>Total (FC+LC)</b>	<b>5,438,830,000</b>	<b>100</b>		<b>1,435,850,000</b>	<b>1,435,850,000</b>	<b>1,435,850,000</b>	<b>1,131,280,000</b>			
<b>1.1 Total of 1.2.5 (FC)</b>	FC	81,724,266,000	61	13,176,998,000	19,419,148,000	21,437,785,000	15,618,617,000	12,071,718,000			
<b>1.2 Total of 1.2.5 (LC)</b>	LC	51,186,753,100	39	7,873,037,000	6,553,504,100	17,146,152,000	11,213,070,000	8,400,990,000			
<b>1.3 Total of 1.2.5 (Unskilled Labors)</b>	(unskilled labors)	15,732,706,000	31	3,633,384,000	1,804,366,000	5,671,372,000	2,596,094,000	2,027,490,000			
<b>1.4 Total of 1.2.5 (Grand Total)</b>	<b>Total (FC+LC)</b>	<b>132,911,019,100</b>	<b>100</b>	<b>21,050,035,000</b>	<b>25,972,652,100</b>	<b>38,583,937,000</b>	<b>26,831,687,000</b>	<b>20,472,708,000</b>			
2.1 Physical Contingency (5% of 1.1)	5% FC	4,086,213,300	61	658,849,900	970,957,400	1,071,889,250	780,930,850	603,585,900			
2.2 Physical Contingency (5% of 1.2)	5% LC	2,559,337,655	39	393,651,850	327,675,205	857,307,600	560,653,500	420,049,500			
2.3 Physical Contingency (5% of 1.3)	5% (unskilled labors)	786,635,300	31	181,669,200	90,218,300	283,568,600	129,804,700	101,374,500			
2.4 Physical Contingency (5% of 1.4)	5% <b>Total (FC+LC)</b>	<b>6,645,550,955</b>	<b>100</b>	<b>1,052,501,750</b>	<b>1,298,632,605</b>	<b>1,929,196,850</b>	<b>1,341,584,350</b>	<b>1,023,635,400</b>			
3.1 Total of 1.1 & 2.1	FC	85,810,479,300	61	13,835,847,900	20,390,105,400	22,509,674,250	16,399,547,850	12,675,303,900			
3.2 Total of 1.1 & 2.2	LC	53,746,090,755	39	8,266,688,850	6,881,179,305	18,003,459,600	11,773,723,500	8,821,039,500			
3.3 Total of 1.1 & 2.3	(unskilled labors)	16,519,341,300	31	3,815,053,200	1,894,584,300	5,954,940,600	2,725,898,700	2,128,864,500			
3.4 Total of 1.1 & 2.4	<b>Total (FC+LC)</b>	<b>139,556,570,555</b>	<b>100</b>	<b>22,102,536,750</b>	<b>27,271,284,705</b>	<b>40,513,133,850</b>	<b>28,173,271,350</b>	<b>21,496,343,400</b>			
4 Project Management (10% of 1)	10% LC	10,897,096,000	100	1,513,583,100	1,194,977,700	3,714,808,700	2,539,583,700	1,934,142,800			
5 Others (Miscellaneous 5% of 1-2)	5% LC	5,744,258,200	100	1,052,501,750	597,488,850	1,857,404,350	1,269,791,850	967,071,400			
6.1 Grand Total Cost for Project Evaluation	FC	85,810,479,300	55	13,835,847,900	20,390,105,400	22,509,674,250	16,399,547,850	12,675,303,900			
6.2 Grand Total Cost for Project Evaluation	LC	70,387,444,955	45	10,832,773,700	8,673,645,855	23,575,672,650	15,583,099,050	11,722,253,700			
6.3 Grand Total Cost for Project Evaluation	<b>Total (FC+LC)</b>	<b>156,197,924,255</b>	<b>100</b>	<b>24,668,621,600</b>	<b>29,063,751,255</b>	<b>46,085,346,900</b>	<b>31,982,646,900</b>	<b>24,397,557,600</b>			
<b>7 Operation and Maintenance</b>	0.30% LC				63,150,105	126,056,919	237,501,180	313,688,691	371,712,975		371,712,975





**Table 3.1.8 Project Benefit Estimation -Base1**

x	2015			2016			2017			2018			2019			2020		
	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic
1 Agriculture Production																		
1.1 North Nawin																		
1.1.1 Black Gram																		
(a) Increase of Sawn Area (ac)	10,192.16		10,192	15,178.42		15,178.42	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0
(b) Gross Profit (Kt ac)	328,000	1.07	350,960	328,000	1.07	350,960												
(c) Input Cost (kt ac)	37,086	0.77	28,556	37,086	0.77	28,556												
(d) Family Labor (kt ac)	28,258	0.60	16,955	28,258	0.60	16,955												
(e) Hired Labor (kt ac)	36,535	0.60	21,921	39,441	0.60	23,665												
(f) Unit Net Profit (kt ac)	226,121		283,528	223,215		281,784												
(g) Net Profit (Kt)	2,304,661,411		2,889,717,376	3,388,051,020		4,277,035,901												
(h) Accumulated Net Profit (Kt)	2,304,661,411		2,889,717,376	5,692,712,431		7,166,753,277	5,692,712,431		7,166,753,277	5,692,712,431		7,166,753,277	5,692,712,431		7,166,753,277	5,692,712,431		7,166,753,277
1.2 South Nawin																		
1.2.1 Black Gram																		
(a) Increase of Sawn Area (ac)	17,608.66		17,608.66	22,141.91		22,141.91	18,705.22		18,705.22	0	0.00	0	0	0.00	0	0	0.00	0
(b) Gross Profit (Kt ac)	250,167	1.07	267,679	250,167	1.07	267,679	250,167	1.07	267,679									
(c) Input Cost (kt ac)	38,684	0.77	29,787	38,684	0.77	29,787	38,684	0.77	29,787									
(d) Family Labor (kt ac)	26,176	0.60	15,706	26,176	0.60	15,706	26,176	0.60	15,706									
(e) Hired Labor (kt ac)	36,535	0.60	21,921	36,535	0.60	21,921	36,535	0.60	21,921									
(f) Unit Net Profit (kt ac)	148,772		200,265	148,772		200,265	148,772		200,265									
(g) Net Profit (Kt)	2,619,675,566		3,526,398,295	3,294,096,235		4,434,249,606	2,782,812,990		3,746,000,883									
(h) Accumulated Net Profit (Kt)	2,619,675,566		3,526,398,295	5,913,771,801		7,960,647,901	8,696,584,791		11,706,648,784	8,696,584,791		11,706,648,784	8,696,584,791		11,706,648,784	8,696,584,791		11,706,648,784
1.3 Wegy																		
1.3.1 Black Gram																		
(a) Increase of Sawn Area (ac)							2,268.72		2,268.72	0.00		0.00	433.17		433.17	0.00		0.00
(b) Gross Profit (Kt ac)							250,167	1.07	267,679	328,000	1.07	350,960	153,494	1.07	164,239	0	1.07	0
(c) Input Cost (kt ac)							38,684	0.77	29,787	37,086	0.77	28,556	15,476	0.77	11,917	0	0.77	0
(d) Family Labor (kt ac)							26,176	0.60	15,706	28,258	0.60	16,955	26,644	0.60	15,986	0	0.60	0
(e) Hired Labor (kt ac)							36,535	0.60	21,921	39,441	0.60	23,665	37,188	0.60	22,313	0	0.60	0
(f) Unit Net Profit (kt ac)							148,772		200,265	223,215		281,784	74,186		114,023	0		0
(g) Net Profit (Kt)							337,522,012		454,345,211	0		0	32,135,150		49,391,343	0		0
(h) Accumulated Net Profit (Kt)							337,522,012		454,345,211	337,522,012		454,345,211	369,657,162		503,736,554	369,657,162		503,736,554
1.4 Taung Nyo																		
1.4.1 Black Gram																		
(a) Increase of Sawn Area (ac)							9,104.47		9,104.47	10,683.44		10,683.44	0.00		0.00	0.00		0.00
(b) Gross Profit (Kt ac)							250,167	1.07	267,679	328,000	1.07	350,960	0	1.07	0	0	1.07	0
(c) Input Cost (kt ac)							38,684	0.77	29,787	37,086	0.77	28,556	0	0.77	0	0	0.77	0
(d) Family Labor (kt ac)							26,176	0.60	15,706	28,258	0.60	16,955	0	0.60	0	0	0.60	0
(e) Hired Labor (kt ac)							36,535	0.60	21,921	39,441	0.60	23,665	0	0.60	0	0	0.60	0
(f) Unit Net Profit (kt ac)							148,772		200,265	223,215		281,784	0		0	0		0
(g) Net Profit (Kt)							1,354,490,211		1,823,306,685	2,384,704,060		3,010,422,457	0		0	0		0
(h) Accumulated Net Profit (Kt)							1,354,490,211		1,823,306,685	3,739,194,271		4,833,729,142	3,739,194,271		4,833,729,142	3,739,194,271		4,833,729,142
Sub-Total (Base Case, Financial)	4,924,336,977		6,416,115,671	11,606,484,232		15,127,401,178	16,081,309,445		21,151,053,957	18,466,013,505		24,161,476,414	18,498,148,655		24,210,867,757	18,498,148,655		24,210,867,757
G-Tota	4,924,336,977		6,416,115,671	11,606,484,232		15,127,401,178	16,081,309,445		21,151,053,957	18,466,013,505		24,161,476,414	18,498,148,655		24,210,867,757	18,498,148,655		24,210,867,757



**Table 3.1.9 Financial Cost and Benefit Analyses (Base1)**

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	FIRR =	15.3%		B/C =	1.22	
						Present Value Factor	Present Value		Present Value Factor	Present Value	
	Investment	O & M	Total	Total	Total	Value Factor	Discount Rate	15.3%	Value Factor	Discount Rate	12.0%
							Cost	Benefit		Cost	Benefit
1	23,616,120,000		23,616,120,000	0	-23,616,120,000	0.86730	20,482,260,876	0	0.89286	21,085,888,903	0
2	28,466,262,000	63,150,000	28,529,412,000	5,195,148,066	-23,334,263,934	0.75221	21,460,109,001	3,907,842,327	0.79719	22,743,361,952	4,141,520,087
3	44,227,943,000	141,068,061	44,369,011,061	13,595,014,920	-30,773,996,141	0.65240	28,946,342,816	8,869,387,734	0.71178	31,580,974,693	9,676,659,720
4	30,712,856,000	256,819,872	30,969,675,872	19,113,096,550	-11,856,579,322	0.56583	17,523,571,699	10,814,763,421	0.63552	19,681,848,410	12,146,755,119
5	23,750,285,000	337,314,933	24,087,599,933	21,599,976,556	-2,487,623,377	0.49074	11,820,748,791	10,599,972,495	0.56743	13,668,026,830	12,256,474,697
6		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.42562	143,567,982	9,193,382,022	0.50663	170,893,865	10,943,196,123
7		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.36914	124,516,434	7,973,415,346	0.45235	152,584,410	9,770,749,395
8		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.32016	107,994,749	6,915,448,494	0.40388	136,234,755	8,723,798,531
9		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.27767	93,662,237	5,997,665,490	0.36061	121,639,138	7,789,167,546
10		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.24083	81,235,555	5,201,922,354	0.32197	108,605,289	6,954,544,452
11		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.20887	70,454,970	4,511,587,103	0.28748	96,971,297	6,209,561,260
12		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.18115	61,104,600	3,912,835,753	0.25668	86,581,997	5,544,281,982
13		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.15712	52,998,922	3,393,788,316	0.22917	77,302,463	4,950,066,627
14		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.13627	45,965,906	2,943,428,805	0.20462	69,021,382	4,419,787,203
15		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.11818	39,863,879	2,552,685,229	0.18270	61,627,438	3,946,315,717
16		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.10250	34,574,781	2,213,997,597	0.16312	55,022,812	3,523,388,176
17		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.08890	29,987,298	1,920,237,916	0.14564	49,126,547	3,145,820,586
18		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.07710	26,006,981	1,665,358,192	0.13004	43,864,434	2,808,860,951
19		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.06687	22,556,250	1,444,390,432	0.11611	39,165,637	2,507,973,278
20		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.05800	19,564,266	1,252,798,640	0.10367	34,969,439	2,239,269,570
21		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.05030	16,966,941	1,086,478,821	0.09256	31,221,870	1,999,293,830
22		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.04363	14,717,051	942,406,977	0.08264	27,875,706	1,785,022,063
23		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.03784	12,763,997	817,343,113	0.07379	24,890,469	1,593,862,270
24		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.03282	11,070,676	708,911,231	0.06588	22,222,308	1,423,006,456
25		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.02846	9,599,983	614,735,333	0.05882	19,840,864	1,270,510,621
26		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.02469	8,328,306	533,303,421	0.05252	17,715,780	1,134,430,769
27		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.02141	7,221,913	462,455,498	0.04689	15,816,697	1,012,822,901
28		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.01857	6,263,938	401,111,565	0.04187	14,123,376	904,391,018
29		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.01610	5,430,770	347,759,623	0.03738	12,608,832	807,407,124
30		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.01397	4,712,290	301,751,672	0.03338	11,259,572	721,007,217
Total	150,773,466,000	9,231,226,191	160,004,692,191		439,497,957,801		101,284,163,858	101,501,164,920		110,261,287,165	134,349,945,289
							NPV =	217,001,062		NPV =	24,088,658,124

**Table 3.1.10 Economic Cost and Benefit Analyses (Base1)**

			E IRR =		22.2%		B/C =		1.66	
Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	Present Value Factor	Present Value		Present Value Factor	Present Value	
Investment	O & M	Total	Total			Discount Rate	22.2%		Discount Rate	12.0%
						Cost	Benefit		Cost	Benefit
21,924,003,000		21,924,003,000	0	-21,924,003,000	0.81833	17,941,069,375	0	0.89286	19,575,065,319	0
23,858,119,000	63,150,000	23,921,269,000	6,684,353,535	-17,236,915,465	0.66966	16,019,116,999	4,476,244,188	0.79719	19,069,796,434	5,328,699,795
41,531,145,000	141,068,061	41,672,213,061	17,053,505,075	-24,618,707,986	0.54801	22,836,789,480	9,345,491,316	0.71178	29,661,447,813	12,138,343,842
29,600,465,000	256,819,872	29,857,284,872	24,053,704,606	-5,803,580,266	0.44845	13,389,499,401	10,786,883,831	0.63552	18,974,901,682	15,286,610,351
22,759,543,000	337,314,933	23,096,857,933	27,165,281,249	4,068,423,316	0.36698	8,476,084,924	9,969,114,913	0.56743	13,105,850,097	15,414,395,539
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.30031	101,299,048	8,158,005,612	0.50663	170,893,865	13,762,746,439
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.24575	82,895,145	6,675,867,867	0.45235	152,584,410	12,288,214,973
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.20111	67,837,406	5,463,209,712	0.40388	136,234,755	10,971,513,791
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.16457	55,511,919	4,470,590,335	0.36061	121,639,138	9,796,072,071
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.13468	45,429,575	3,658,620,079	0.32197	108,605,289	8,746,405,604
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.11021	37,175,479	2,993,885,646	0.28748	96,971,297	7,809,475,053
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.09019	30,422,434	2,450,036,716	0.25668	86,581,997	6,972,784,391
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.07380	24,893,842	2,004,797,756	0.22917	77,302,463	6,225,467,504
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.06040	20,373,822	1,640,782,987	0.20462	69,021,382	5,558,559,849
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.04942	16,670,104	1,342,508,199	0.18270	61,627,438	4,963,096,884
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.04044	13,641,016	1,098,563,974	0.16312	55,022,812	4,431,200,677
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.03310	11,165,124	899,170,809	0.14564	49,126,547	3,956,351,561
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.02708	9,134,488	735,635,816	0.13004	43,864,434	3,532,573,174
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.02216	7,474,899	601,982,632	0.11611	39,165,637	3,154,160,806
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.01814	6,118,893	492,778,202	0.10367	34,969,439	2,816,224,707
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.01484	5,005,754	403,132,774	0.09256	31,221,870	2,514,418,432
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.01215	4,098,376	330,058,167	0.08264	27,875,706	2,244,938,842
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00994	3,352,910	270,022,896	0.07379	24,890,469	2,004,526,103
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00813	2,742,370	220,853,737	0.06588	22,222,308	1,789,648,729
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00666	2,246,517	180,920,773	0.05882	19,840,864	1,597,861,843
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00545	1,838,366	148,050,783	0.05252	17,715,780	1,426,720,571
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00446	1,504,425	121,157,154	0.04689	15,816,697	1,273,780,038
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00365	1,231,200	99,153,277	0.04187	14,123,376	1,137,410,326
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00298	1,005,199	80,952,538	0.03738	12,608,832	1,015,438,213
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00244	823,048	66,283,286	0.03338	11,259,572	906,777,088
139,673,275,000	9,231,226,191	148,904,501,191	747,404,522,155	605,184,374,499	4	79,216,451,538	79,184,755,975		101,888,247,722	169,064,417,196
						NPV =	-31,695,563			NPV = 67,176,169,474

Table 3.1.11 Project Cost Estimation (Financial / Economic)-Base2

	2014#				2015#				2016#				2017#				2018#			
	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic
	FC	LC			FC	LC			FC	LC			FC	LC			FC	LC		
<b>North Iwam</b>	5,670,593		1.00	5,670,593	2,251,815		1.00	2,251,815	925,000		1.00	925,000								
LC	Total	6,026,611		5,977,301	1,997,549		0.99	1,850,746	847,771		0.99	844,481								
	Material	1,250,000		1,250,000	711,000		0.99	705,635	60,000		0.99	59,400								
	Skilled Labor	100,000		100,000	40,000		1.00	40,000	20,000		1.00	20,000								
	Unskilled Labor	3,000,000		2,880,000	1,000,000		0.98	980,000	200,000		0.98	196,000								
<b>South Iwam</b>	1,592,204		1.00	1,592,204	4,899,827		1.00	4,899,827	4,199,261		1.00	4,199,261								
LC	Total	1,592,204		1,592,204	3,244,566		0.99	2,988,125	3,345,230		0.99	3,315,620								
	Material	500,000		500,000	1,500,000		0.99	1,485,000	1,500,000		0.99	1,485,000								
	Skilled Labor	100,000		100,000	200,000		1.00	200,000	200,000		1.00	200,000								
	Unskilled Labor	992,204		992,204	1,544,566		0.98	1,503,125	1,645,230		0.98	1,630,620								
<b>Weyi</b>								6,945,724			6,945,724			8,189,769			5,249,921			1,000
LC	Total							8,576,718			8,576,718			9,684,899			5,257,825			4,428,114
	Material							1,000,000			1,000,000			1,000,000			1,000,000			1,000,000
	Skilled Labor							2,000,000			2,000,000			2,000,000			2,000,000			2,000,000
	Unskilled Labor							5,576,718			5,576,718			6,684,899			2,247,825			1,428,114
<b>Taung Nya</b>							1,855,400			1,855,400			5,886,708			5,886,708			3,122,676	
LC	Total							3,127,123			3,127,123			4,269,847			2,786,755			2,457,993
	Material							1,000,000			1,000,000			1,000,000			1,000,000			1,000,000
	Skilled Labor							500,000			500,000			500,000			500,000			500,000
	Unskilled Labor							2,627,123			2,627,123			3,786,847			1,286,755			957,993
<b>Sub Total(FC+LC)</b>	7,362,794	7,875,937		7,362,794	8,767,642		1.00	8,767,642	10,395,645		1.00	10,395,645				11,438,645			11,474,848	13,862,730
<b>Machinery Procurement</b>	5,944,204		1.00	5,944,204	8,871,306		1.00	8,871,306												
<b>Engineering Service</b>																				
Engineering Service (D1)					2,000,000		1.00	2,000,000												
Engineering Service (S1)					1,142,140		1.00	1,142,140	3,142,140		1.00	3,142,140								1,142,140
					285,710		0.99	285,710	285,710		0.99	285,710								285,710
<b>Total</b>	13,176,998	13,176,998		13,176,998	14,638,948		1.00	14,638,948	17,117,591		1.00	17,117,591				18,581,591			18,581,591	21,915,908
<b>Physical Contingency 5%</b>	658,850	658,850		658,850	731,947		1.00	731,947	818,687		1.00	818,687				818,687			818,687	920,789
<b>Physical Contingency 10%</b>	1,317,700	1,317,700		1,317,700	1,463,894		1.00	1,463,894	1,637,374		1.00	1,637,374				1,637,374			1,637,374	1,841,578
<b>Sub-Total</b>	14,562,127	14,562,127		14,562,127	16,834,789		1.00	16,834,789	19,573,742		1.00	19,573,742				21,038,252			21,038,252	24,578,215
<b>Grand Total(FC+LC)</b>		15,616,120			18,301,683			18,301,683	21,211,514			21,211,514				22,675,924			22,675,924	26,419,793
<b>O&amp;M 0.3%</b>					55,850			55,850	157,800			157,800				157,800			157,800	178,000

Table 3.1.12 Project Cost and Benefit Estimation -Base2

Particulars	FC/LC	Total	Ratio, %	2014	2015	2016	2017	2018
<b>Implementation</b>								
<b>1. Civil &amp; Structure Construction</b>								
1.1 North Nawin	FC	8,853,517,000	49	5,670,592,000	2,257,825,000	925,100,000		
	LC	9,131,937,000	51	6,326,617,000	1,937,549,000	867,771,000		
	(unskilled labors)	4,012,079,000	44	3,014,741,000	698,325,000	299,013,000		
	Sub Total (FC+LC)	17,985,454,000	100	11,997,209,000	4,195,374,000	1,792,871,000	0	
1.2 South Nawin	FC	10,471,300,000	54	1,592,202,000	4,309,837,000	4,569,261,000		
	LC	8,871,117,000	46	1,546,420,000	3,444,566,000	3,880,131,000		
	(unskilled labors)	2,992,881,000	34	618,643,000	1,106,041,000	1,268,197,000		
	Sub Total (FC+LC)	19,342,417,000	100	3,138,622,000	7,754,403,000	8,449,392,000	0	
1.3 Wegyi	FC	25,984,725,000	56			9,945,784,000	8,589,769,000	7,449,172,000
	LC	20,352,398,000	44			8,576,719,000	6,387,854,000	5,387,825,000
	(unskilled labors)	6,379,155,000	31			3,248,790,000	1,667,300,000	1,463,065,000
	Sub Total (FC+LC)	46,337,123,000	100			18,522,503,000	14,977,623,000	12,836,997,000
1.4 Taung Nyo	FC	14,464,884,000	57			4,855,500,000	5,886,708,000	3,722,676,000
	LC	10,841,082,000	43			3,527,821,000	4,531,506,000	2,781,755,000
	(unskilled labors)	2,348,591,000	22			855,372,000	928,794,000	564,425,000
	Sub Total (FC+LC)	25,305,966,000	100			8,383,321,000	10,418,214,000	6,504,431,000
<b>Total of Civil &amp; Structure Construction</b>	FC	59,774,426,000	55	7,262,794,000	6,567,662,000	20,295,645,000	14,476,477,000	11,171,848,000
	LC	49,196,534,000	45	7,873,037,000	5,382,115,000	16,852,442,000	10,919,360,000	8,169,580,000
	(unskilled labors)	15,732,706,000	32	3,633,384,000	1,804,366,000	5,671,372,000	2,596,094,000	2,027,490,000
	<b>Total (FC+LC)</b>	<b>108,970,960,000</b>	<b>100</b>	<b>15,135,831,000</b>	<b>11,949,777,000</b>	<b>37,148,087,000</b>	<b>25,395,837,000</b>	<b>19,341,428,000</b>
<b>2. Machineries Procurement</b>	FC	14,785,510,000	99	5,914,204,000	8,871,306,000			
	LC	147,855,100	1		147,855,100			
	<b>Total (FC+LC)</b>	<b>14,933,365,100</b>	<b>100</b>	<b>5,914,204,000</b>	<b>9,019,161,100</b>	<b>0</b>	<b>0</b>	
<b>5. Engineering Service</b>		0						
5.1 Engineering Service (DD)	FC	2,838,040,000	80		2,838,040,000			
	LC	729,824,000	20		729,824,000			
	<b>Total (FC+LC)</b>	<b>3,567,864,000</b>	<b>100</b>		<b>3,567,864,000</b>	<b>0</b>	<b>0</b>	
5.2 Engineering Service (SV)	FC	4,326,290,000	80		1,142,140,000	1,142,140,000	1,142,140,000	899,870,000
	LC	1,112,540,000	20		293,710,000	293,710,000	293,710,000	231,410,000
	<b>Total (FC+LC)</b>	<b>5,438,830,000</b>	<b>100</b>		<b>1,435,850,000</b>	<b>1,435,850,000</b>	<b>1,435,850,000</b>	<b>1,131,280,000</b>
<b>1.1 Total of 1, 2, 5 (FC)</b>	FC	81,724,266,000	61	13,176,998,000	19,419,148,000	21,437,785,000	15,618,617,000	12,071,718,000
<b>1.2 Total of 1, 2, 5 (LC)</b>	LC	51,186,753,100	39	7,873,037,000	6,553,504,100	17,146,152,000	11,213,070,000	8,400,990,000
<b>1.3 Total of 1, 2, 5 (Unskilled Labors)</b>	(unskilled labors)	15,732,706,000	31	3,633,384,000	1,804,366,000	5,671,372,000	2,596,094,000	2,027,490,000
<b>1.4 Total of 1, 2, 5 (Grand Total)</b>	<b>Total (FC+LC)</b>	<b>132,911,019,100</b>	<b>100</b>	<b>21,050,035,000</b>	<b>25,972,652,100</b>	<b>38,583,937,000</b>	<b>26,831,687,000</b>	<b>20,472,708,000</b>
2.1 Physical Contingency (5% of 1.1)	5% FC	4,086,213,300	61	658,849,900	970,957,400	1,071,889,250	780,930,850	603,585,900
2.2 Physical Contingency (5% of 1.2)	5% LC	2,559,337,655	39	393,651,850	327,675,205	857,307,600	560,653,500	420,049,500
2.3 Physical Contingency (5% of 1.3)	5% (unskilled labors)	786,635,300	31	181,669,200	90,218,300	283,568,600	129,804,700	101,374,500
2.4 Physical Contingency (5% of 1.4)	5% <b>Total (FC+LC)</b>	<b>6,645,550,955</b>	<b>100</b>	<b>1,052,501,750</b>	<b>1,298,632,605</b>	<b>1,929,196,850</b>	<b>1,341,584,350</b>	<b>1,023,635,400</b>
3.1 Total of 1.1 & 2.1	FC	85,810,479,300	61	13,835,847,900	20,390,105,400	22,509,674,250	16,399,547,850	12,675,303,900
3.2 Total of 1.1 & 2.2	LC	53,746,090,755	39	8,266,688,850	6,881,179,305	18,003,459,600	11,773,723,500	8,821,039,500
3.3 Total of 1.1 & 2.3	(unskilled labors)	16,519,341,300	31	3,815,053,200	1,894,584,300	5,954,940,600	2,725,898,700	2,128,864,500
3.4 Total of 1.1 & 2.4	<b>Total (FC+LC)</b>	<b>139,556,570,055</b>	<b>100</b>	<b>22,102,536,750</b>	<b>27,271,284,705</b>	<b>40,513,133,850</b>	<b>28,173,271,350</b>	<b>21,496,343,400</b>
4. Project Management (10% of 1)	10% LC	10,897,096,000	100	1,513,583,100	1,194,977,700	3,714,808,700	2,539,583,700	1,934,142,800
5. Others (Miscellaneous, 5% of 1-2)	5% LC	5,744,258,200	100	1,052,501,750	597,488,850	1,857,404,350	1,269,791,850	967,071,400
6.1 Grand Total Cost for Project Evaluation	FC	85,810,479,300	55	13,835,847,900	20,390,105,400	22,509,674,250	16,399,547,850	12,675,303,900
6.2 Grand Total Cost for Project Evaluation	LC	70,387,444,955	45	10,832,773,700	8,673,645,855	23,575,672,650	15,583,099,050	11,722,253,700
6.3 Grand Total Cost for Project Evaluation	<b>Total (FC+LC)</b>	<b>156,197,924,255</b>	<b>100</b>	<b>24,668,621,600</b>	<b>29,063,751,255</b>	<b>46,085,346,900</b>	<b>31,982,646,900</b>	<b>24,397,557,600</b>
<b>7. Operation and Maintenance</b>	0.30% LC				63,150,105	126,056,919	237,501,180	313,688,691



Table 3.1.13 Project Benefit Estimation -Base 2

x	2015			2016			2017			2018			2019		
	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic
<b>1. Agriculture Production</b>															
<b>1.1 North Nawin</b>															
1.1.1 Black Gram															
(a) Increase of Sawn Area (ac)	10,192.16		10,192	15,178.42		15,178.42	0	0.00	0	0	0.00	0	0	0.00	0
(b) Gross Profit (Kt/ac)	328,000	1.07	350,960	328,000	1.07	350,960									
(c) Input Cost (Kt/ac)	37,086	0.77	28,556	37,086	0.77	28,556									
(d) Family Labor (kt/ac)	28,258	0.60	16,955	28,258	0.60	16,955									
(e) Hired Labor (kt/ac)	36,535	0.60	21,921	39,441	0.60	23,665									
(f) Unit Net Profit (Kt/ac)	226,121		283,528	223,215		281,784									
(g) Net Profit (Kt)	2,304,661,411		2,889,717,376	3,388,051,020		4,277,035,901									
(h) Accumulated Net Profit (Kt)	2,304,661,411		2,889,717,376	5,692,712,431		7,166,753,277	5,692,712,431		7,166,753,277	5,692,712,431		7,166,753,277	5,692,712,431		7,166,753,277
<b>1.2 South Nawin</b>															
1.2.1 Black Gram															
(a) Increase of Sawn Area (ac)	17,608.66		17,608.66	22,141.91		22,141.91	18,705.22		18,705.22	0	0.00	0	0	0.00	0
(b) Gross Profit (Kt/ac)	250,167	1.07	267,679	250,167	1.07	267,679	267,679	1.07	267,679						
(c) Input Cost (Kt/ac)	38,684	0.77	29,787	38,684	0.77	29,787	38,684	0.77	29,787						
(d) Family Labor (kt/ac)	26,176	0.60	15,706	26,176	0.60	15,706	26,176	0.60	15,706						
(e) Hired Labor (kt/ac)	36,535	0.60	21,921	36,535	0.60	21,921	36,535	0.60	21,921						
(f) Unit Net Profit (Kt/ac)	148,772		200,265	148,772		200,265	148,772		200,265						
(g) Net Profit (Kt)	2,619,675,566		3,526,398,295	3,294,096,235		4,434,249,606	2,782,812,990		3,746,000,883						
(h) Accumulated Net Profit (Kt)	2,619,675,566		3,526,398,295	5,913,771,801		7,960,647,901	8,696,584,791		11,706,648,784	8,696,584,791		11,706,648,784	8,696,584,791		11,706,648,784
<b>1.3 Wegyi</b>															
1.3.1 Black Gram															
(a) Increase of Sawn Area (ac)							2,268.72		2,268.72	0.00		0.00	433.17		433.17
(b) Gross Profit (Kt/ac)							250,167	1.07	267,679	328,000	1.07	350,960	153,494	1.07	164,239
(c) Input Cost (Kt/ac)							38,684.00	0.77	29,787	37,086	0.77	28,556	15,476	0.77	11,917
(d) Family Labor (kt/ac)							26,176	0.60	15,706	28,258	0.60	16,955	26,644	0.60	15,986
(e) Hired Labor (kt/ac)							36,535.00	0.60	21,921	39,441	0.60	23,665	37,188	0.60	22,313
(f) Unit Net Profit (Kt/ac)							148,772		200,265	223,215		281,784	74,186		114,023
(g) Net Profit (Kt)							337,522,012		454,345,211	0		0	32,135,150		49,391,343
(h) Accumulated Net Profit (Kt)							337,522,012		454,345,211	337,522,012		454,345,211	369,657,162		503,736,554
<b>1.4 Taung Nyo</b>															
1.4.1 Black Gram															
(a) Increase of Sawn Area (ac)							9,104.47		9,104.47	10,683.44		10,683.44	0.00		0.00
(b) Gross Profit (Kt/ac)							250,167	1.07	267,679	328,000	1.07	350,960	0	1.07	0
(c) Input Cost (Kt/ac)							38,684	0.77	29,787	37,086	0.77	28,556	0	0.77	0
(d) Family Labor (kt/ac)							26,176	0.60	15,706	28,258	0.60	16,955	0	0.60	0
(e) Hired Labor (kt/ac)							36,535	0.60	21,921	39,441	0.60	23,665	0	0.60	0
(f) Unit Net Profit (Kt/ac)							148,772		200,265	223,215		281,784	0		0
(g) Net Profit (Kt)							1,354,490,211		1,823,306,685	2,384,704,060		3,010,422,457	0		0
(h) Accumulated Net Profit (Kt)							1,354,490,211		1,823,306,685	3,739,194,271		4,833,729,142	3,739,194,271		4,833,729,142
<b>Sub-Total (Base Case, Financial)</b>	<b>4,924,336,977</b>		<b>6,416,115,671</b>	<b>11,606,484,232</b>		<b>15,127,401,178</b>	<b>16,081,309,445</b>		<b>21,151,053,957</b>	<b>18,466,013,505</b>		<b>24,161,476,414</b>	<b>18,498,148,655</b>		<b>24,210,867,757</b>





Benefit	2016			2017			2018			2019		
	Financial cost	Conversion Factor	Economic cost	Financial cost	Conversion Factor	Economic cost	Financial cost	Conversion Factor	Economic cost	Financial cost	Conversion Factor	Economic cost
<b>1. Road Improvement</b>												
<b>1.1 North Nawin</b>												
1.1.1 Monsoon Paddy												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (kt)												
(c) Cost after Rehabilitation (Kt)												
(d) Net Profit (Kt)												
1.1.2 Summer Paddy												
(a) Area Improved (ac)	2,998		2,998	0		0	0		0	0		0
(b) Cost before Rehabilitation (kt)	179,906,400	0.99	178,107,336	0	0.99	0	0	0.99	0	0	0.99	0
(c) Cost after Rehabilitation (Kt)	63,515,955	0.99	62,880,795	0	0.99	0	0	0.99	0	0	0.99	0
(d) Net Profit (Kt)	116,390,445		115,226,541	159,497,888		115,226,541	159,497,888		115,226,541	159,497,888		115,226,541
1.1.3 Improvement of Trolleergy Driving												
(a) Monsoon Paddy Cultivation (kyat)	9,551,109	0.99	9,455,598	3,537,447	0.99	3,502,073						
(b) Summer Paddy Cultivation (kyat)	1,688,122	0.99	1,671,241	625,228	0.99	618,976						
(c) Black Gram Cultivation (kyat)	12,939,351	0.99	12,809,957	4,792,358	0.99	4,744,434						
(d) Sub-total of Trolleergy Driving (kyat)	24,178,582		23,936,796	8,955,033		8,865,483			0			0
(e) Accumulation of Trolleergy (kyat)	24,178,582		23,936,796	33,133,615		32,802,279	33,133,615		32,802,279	33,133,615		32,802,279
<b>1.2 South Nawin</b>												
1.2.1 Monsoon Paddy												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (kt)												
(c) Cost after Rehabilitation (Kt)												
(d) Net Profit (Kt)												
1.2.2 Summer Paddy												
(a) Area Improved (ac)	2,245		2,245	1,464		1,464	0		0	0		0
(b) Cost before Rehabilitation (kt)	134,729,400	0.99	133,382,106	87,867,000	0.99	86,988,330	0	0.99	0	0	0.99	0
(c) Cost after Rehabilitation (Kt)	47,566,215	0.99	47,090,553	31,021,444	0.99	30,711,230	0	0.99	0	0	0.99	0
(d) Net Profit (Kt)	87,163,185		86,291,553	144,008,741		142,568,653	144,008,741		86,291,553	144,008,741		86,291,553
1.2.3 Improvement of Trolleergy Driving												
(a) Monsoon Paddy Cultivation (kyat)	13,488,602	0.99	13,488,602	8,796,914	0.99	8,708,945	0	0.99	0			
(b) Summer Paddy Cultivation (kyat)	1,264,211	0.99	1,251,569	824,485	0.99	816,240	0	0.99	0			
(c) Black Gram Cultivation (kyat)	28,326,064	0.99	28,042,803	18,473,520	0.99	18,288,785	0	0.99	0			
(d) Sub-total of Trolleergy Driving (kyat)	43,078,877		42,782,974	28,094,919		27,813,970	0		0			0
(e) Accumulation of Trolleergy (kyat)	43,078,877		42,782,974	71,173,796		70,596,944	71,173,796		70,596,944	71,173,796		70,596,944
<b>1.3 Wegyi</b>												
1.3.1 Monsoon Paddy												
(a) Area Improved (ac)			13,413			13,413	5,412		5,412	5,412		5,412
(b) Cost before Rehabilitation (kt)			934,966,937	0.99	925,617,268	377,267,324	0.99	373,494,651	377,267,324	0.99	373,494,651	
(c) Cost after Rehabilitation (Kt)			284,135,840	0.99	281,294,482	114,651,293	0.99	113,504,780	114,651,293	0.99	113,504,780	
(d) Net Profit (Kt)			650,831,097		644,322,786	913,447,128		904,312,657	913,447,128		904,312,657	
1.3.2 Summer Paddy												
(a) Area Improved (ac)			773			773	5,421		5,421	1,603		1,603
(b) Cost before Rehabilitation (kt)			46,358,400	0.99	45,894,816	325,233,000	0.99	321,980,670	96,174,600	0.99	95,212,854	
(c) Cost after Rehabilitation (Kt)			16,366,833	0.99	16,203,165	114,823,511	0.99	113,675,276	33,954,443	0.99	33,614,899	
(d) Net Profit (Kt)			29,991,567		29,691,651	240,401,056		237,997,045	302,621,213		299,595,000	
1.3.3 Improvement of Trolleergy Driving												
(a) Monsoon Paddy Cultivation (kyat)			7,551,739	0.99	7,476,222	3,047,192	0.99	3,016,720	30,618,220	0.99	30,312,038	
(b) Summer Paddy Cultivation (kyat)			434,996	0.99	430,646	3,051,770	0.99	3,021,252	5,878,593	0.99	5,819,807	
(c) Black Gram Cultivation (kyat)			10,348,045	0.99	10,244,565	4,175,529	0.99	4,133,774	3,458,976	0.99	3,424,386	
(d) Sub-total of Trolleergy Driving (kyat)			18,334,780		18,151,433	10,274,491		10,171,746	39,955,789		39,556,231	
(e) Accumulation of Trolleergy (kyat)			18,334,780		18,151,433	28,609,271		28,323,179	68,565,060		67,879,410	
<b>1.4 Taung Nyo</b>												
1.4.1 Monsoon Paddy												
(a) Area Improved (ac)			16,500			16,500	10,234		10,234	0		0
(b) Cost before Rehabilitation (kt)			1,150,099,271	0.99	1,138,598,278	713,320,066	0.99	706,186,865	0		0	
(c) Cost after Rehabilitation (Kt)			349,514,416	0.99	346,019,272	216,777,501	0.99	214,609,726	0		0	
(d) Net Profit (Kt)			800,584,855		792,579,006	1,297,127,420		1,284,156,145	1,297,127,420		1,284,156,145	
1.4.2 Summer Paddy												
(a) Area Improved (ac)			1,325			1,325	1,157		1,157	0		0
(b) Cost before Rehabilitation (kt)			79,498,200	0.99	78,703,218	69,405,600	0.99	68,711,544	0	0.99	0	
(c) Cost after Rehabilitation (Kt)			28,066,840	0.99	27,786,172	24,503,647	0.99	24,258,611	0	0.99	0	
(d) Net Profit (Kt)			51,431,360		50,917,046	96,333,313		95,369,979	96,333,313		95,369,979	
1.3.3 Improvement of Trolleergy Driving												
(a) Monsoon Paddy Cultivation (kyat)			9,289,365	0.99	9,196,471	5,761,494	0.99	5,703,879	0		0	
(b) Summer Paddy Cultivation (kyat)			745,958	0.99	738,498	651,256	0.99	644,743	0		0	
(c) Black Gram Cultivation (kyat)			19,507,666	0.99	19,312,589	12,099,138	0.99	11,978,147	0		0	
(d) Sub-total of Trolleergy Driving (kyat)			29,542,989		29,247,558	18,511,888		18,326,769	0		0	
(e) Accumulation of Trolleergy (kyat)			29,542,989		29,247,558	48,054,877		47,574,327	48,054,877		47,574,327	
<b>Sub-total of Road Improve Benefit (kt)</b>	<b>270,811,089</b>		<b>268,237,864</b>	<b>1,988,530,688</b>		<b>1,926,103,897</b>	<b>3,031,787,105</b>		<b>2,902,650,649</b>	<b>3,133,963,051</b>		<b>3,003,804,835</b>
<b>Total (Base Case Financial)</b>	<b>5,195,148,066</b>		<b>6,684,353,535</b>	<b>13,595,014,920</b>		<b>17,053,505,075</b>	<b>19,113,096,550</b>		<b>24,053,704,606</b>	<b>21,599,976,556</b>		<b>27,165,281,249</b>

Table 3.1.14 Financial Cost and Benefit Analyses (Base2)

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	FIRR = Present Value Factor	15.9%		B/C = Present Value	1.26	
							Present Value			Present Value	
	Investment	O & M	Total	Total	Total	Value	Discout Rate	15.9%	Value	Discout Rate	12.0%
							Cost	Benefit		Cost	Benefit
1	23,616,120,000		23,616,120,000	0	-23,616,120,000	0.86281	20,376,224,497	0	0.89286	21,085,888,903	0
2	28,466,262,000	63,150,000	28,529,412,000	5,195,148,066	-23,334,263,934	0.74445	21,238,720,763	3,867,527,978	0.79719	22,743,361,952	4,141,520,087
3	44,227,943,000	141,068,061	44,369,011,061	13,595,014,920	-30,773,996,141	0.64232	28,499,103,185	8,732,349,983	0.71178	31,580,974,693	9,676,659,720
4	30,712,856,000	256,819,872	30,969,675,872	19,113,096,550	-11,856,579,322	0.55420	17,163,394,368	10,592,478,108	0.63552	19,681,848,410	12,146,755,119
5	23,750,285,000	337,314,933	24,087,599,933	21,599,976,556	-2,487,623,377	0.47817	11,517,967,660	10,328,460,790	0.56743	13,668,026,830	12,256,474,697
6	-7,320,111,000	337,314,933	-6,982,796,067	21,599,976,556	28,582,772,623	0.41257	-2,880,892,173	8,911,502,328	0.50663	-3,537,693,971	10,943,196,123
7		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.35597	120,073,997	7,688,943,655	0.45235	152,584,410	9,770,749,395
8		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.30714	103,602,909	6,634,216,799	0.40388	136,234,755	8,723,798,531
9		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.26500	89,388,457	5,723,993,787	0.36061	121,639,138	7,789,167,546
10		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.22865	77,127,059	4,938,834,640	0.32197	108,605,289	6,954,544,452
11		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.19728	66,545,490	4,261,243,375	0.28748	96,971,297	6,209,561,260
12		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.17022	57,417,748	3,676,748,009	0.25668	86,581,997	5,544,281,982
13		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.14686	49,538,071	3,172,172,557	0.22917	77,302,463	4,950,066,627
14		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.12672	42,744,548	2,737,149,029	0.20462	69,021,382	4,419,787,203
15		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.10933	36,878,642	2,361,525,437	0.18270	61,627,438	3,946,315,717
16		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.09433	31,818,918	2,037,525,789	0.16312	55,022,812	3,523,388,176
17		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.08139	27,454,062	1,758,022,092	0.14564	49,126,547	3,145,820,586
18		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.07023	23,689,628	1,516,966,354	0.13004	43,864,434	2,808,860,951
19		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.06059	20,437,912	1,308,742,580	0.11611	39,165,637	2,507,973,278
20		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.05228	17,634,825	1,129,246,774	0.10367	34,969,439	2,239,269,570
21		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.04511	15,216,277	974,374,942	0.09256	31,221,870	1,999,293,830
22		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.03892	13,128,297	840,671,088	0.08264	27,875,706	1,785,022,063
23		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.03358	11,327,035	725,327,213	0.07379	24,890,469	1,593,862,270
24		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.02897	9,772,014	625,751,321	0.06588	22,222,308	1,423,006,456
25		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.02500	8,432,873	539,999,414	0.05882	19,840,864	1,270,510,621
26		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.02157	7,275,883	465,911,494	0.05252	17,715,780	1,134,430,769
27		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.01861	6,277,431	401,975,564	0.04689	15,816,697	1,012,822,901
28		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.01606	5,417,278	346,895,623	0.04187	14,123,376	904,391,018
29		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.01385	4,671,812	299,159,675	0.03738	12,608,832	807,407,124
30		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.01195	4,030,913	258,119,720	0.03338	11,259,572	721,007,217
Total	143,453,355,000	9,231,226,191	152,684,581,191		446,818,068,801		96,764,420,379	96,855,836,118		106,552,699,329	134,349,945,289
							NPV =	91,415,739		NPV =	27,797,245,960

**Table 3.1.15 Economic Cost and Benefit Analyses (Base2)**

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	EIRR = Present Value Factor	22.9%		B/C = Present Value Factor	1.72	
							Present Value			Present Value	
							Discount Rate	22.9%		Discount Rate	12.0%
Investment	O & M	Total	Total			Cost	Benefit		Cost	Benefit	
1	21,924,003,000		21,924,003,000	0	-21,924,003,000	0.813669650	17,838,895,848	-	0.892857143	19,575,002,679	0
2	23,858,119,000	58,735,887	23,916,854,887	6,684,353,535	-17,232,501,352	0.6620583	15,834,352,277	4,425,431,735	0.797193878	19,066,370,286	5,328,725,713
3	41,531,145,000	123,700,701	41,654,845,701	17,053,505,075	-24,601,340,626	0.538696745	22,439,329,790	9,186,667,674	0.711780248	29,649,096,396	12,138,348,068
4	29,600,465,000	232,416,621	29,832,881,621	24,053,704,606	-5,779,177,015	0.438321192	13,076,384,232	10,543,248,474	0.635518078	18,959,335,601	15,286,564,130
5	22,759,543,000	310,009,029	23,069,552,029	27,165,281,249	4,095,729,220	0.356648651	8,227,724,608	9,688,460,909	0.567426856	13,090,283,371	15,414,310,124
6	-7,246,910,000	310,009,029	-6,936,900,971	27,165,281,249	34,102,182,220	0.290194183	(2,013,048,310)	7,883,206,598	0.506631121	-3,514,449,916	13,762,776,896
7		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.236122199	73,200,014	6,414,325,955	0.452349215	140,232,341	12,288,193,657
8		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.192125467	59,560,630	5,219,142,355	0.403883228	125,207,447	10,971,601,480
9		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.156326662	48,462,677	4,246,657,734	0.360610025	111,792,364	9,796,072,750
10		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.12719826	39,432,609	3,455,376,513	0.321973237	99,814,610	8,746,493,527
11		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.103497364	32,085,117	2,811,534,998	0.287476104	89,120,188	7,809,369,220
12		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.084212664	26,106,686	2,287,660,698	0.256675093	79,571,596	6,972,651,089
13		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.068521289	21,242,218	1,861,400,080	0.22917419	71,046,068	6,225,581,330
14		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.055753693	17,284,148	1,514,564,752	0.204619813	63,433,989	5,558,554,759
15		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.045365088	14,063,587	1,232,355,372	0.182696261	56,637,491	4,962,995,320
16		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.036912195	11,443,114	1,002,730,164	0.163121662	50,569,188	4,431,245,822
17		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.030034333	9,310,914	815,891,102	0.145644341	45,151,061	3,956,469,484
18		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.024438025	7,576,008	663,865,827	0.13003959	40,313,447	3,532,562,039
19		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.019884479	6,164,368	540,167,475	0.116106777	35,994,149	3,154,073,249
20		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.016179397	5,015,759	439,517,881	0.10366677	32,137,635	2,816,136,963
21		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.013164685	4,081,171	357,622,360	0.09255961	28,694,315	2,514,407,838
22		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.010711704	3,320,725	290,986,461	0.08264251	25,619,924	2,245,007,027
23		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.008715789	2,701,973	236,766,852	0.07378796	22,874,934	2,004,470,686
24		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.007091773	2,198,514	192,650,001	0.06588210	20,424,046	1,789,705,776
25		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.00577036	1,788,864	156,753,459	0.05882331	18,235,757	1,597,951,760
26		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.004695167	1,455,544	127,545,532	0.05252081	16,281,925	1,426,742,575
27		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.003820315	1,184,332	103,779,929	0.04689358	14,537,433	1,273,877,289
28		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.003108474	963,655	84,442,578	0.04186927	12,979,852	1,137,390,495
29		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.002529271	784,097	68,708,363	0.03738327	11,589,151	1,015,527,044
30		310,009,029	310,009,029	27,165,281,249	26,855,272,220	0.002057991	637,996	55,905,910	0.03337792	10,347,457	906,720,584
Total	132,426,365,000	8,475,087,963	140,901,452,963	747,404,522,155	613,187,422,727	4	75,793,703,165	75,907,367,741		98,048,244,785	169,064,526,694
							NPV =	113,664,576		NPV =	71,016,281,909

**Table 3.1.16 Estimated Cost on Equipment Procurement**

No.	Equipment Name	Functions	Specifications	Unit Price				Qty	Amount (000JPY)	(Reference)				
				Basic Price (000JPY)	Spare Parts ②=①×10% (000JPY)	Packing & Transport ③=①×10% (000JPY)	Installation-Management ④=①×5% (000JPY)			CIF Unit Price ⑤=①+②+③+④ (000JPY)	Standard Economic Life (year)	Remaining Value as Scrap (%)	Remaining Economic Value (000JPY)	Remaining Value as Scrap (price)
1	Hydraulic Excavator, Standard	general earth works for rehabilitation of dikes and roads	crawler type, Tier-2, 0.8m <sup>3</sup> , 122kW, long boom hybrid type, w/ crane attachment, dozer	17,500	1,750	1,750	875	21,875	11 units	240,625	9.0	14	152,172	33,688
2	Hydraulic Excavator, Long Arm	earth works for dredge and rehabilitation of main canals	crawler type, super long arm, Tier-2, 0.4m <sup>3</sup> , 130kW, w/ slope bucket	17,200	1,720	1,720	860	21,500	24 units	516,000	9.0	14	323,475	72,240
3	Hydraulic Excavator, Mini Size	earth works for rehabilitation of distributary canals	rubber crawler type, Tier-2, 0.08m <sup>3</sup> , 18kW	3,450	345	345	173	4,313	26 units	112,138	9.0	14	70,250	15,699
4	Hydraulic Breaker	concrete braking works for rehabilitation of existing roads	attachment to excavator, 1300kg class	5,330	-	533	267	6,130	2 units	12,260	7.0	7	7,987	858
5	Track Dozer (Bulldozer)	general earth works for rehabilitation of dikes and roads	11t class, 100kW output, Tier-2	12,400	1,240	1,240	620	15,500	10 units	155,000	12.5	9	105,276	13,950
6	Wheel Loader	general earth works for rehabilitation of dikes and roads	standard type, Tier-2, standard bucket capacity 0.9-1.0m <sup>3</sup> , 55kW	6,180	618	618	309	7,725	3 units	23,175	12.0	11	16,130	2,549
7	Earth Work Vibration Roller	compacting works for roads on dikes	steering type, single drum roller, Tier-2, 11-12ton, 103kW	14,100	1,410	1,410	705	17,625	5 units	88,125	13.0	10	61,064	8,813
8	Hand-guided Vibration Roller	compaction of soils for medium-scale works on canal dikes	120(front)-130(rear)kgf/cm in dynamic pressure, φ355x575, 55Hz, 4.6kW, diesel engine	1,840	184	184	92	2,300	5 units	11,500	6.0	9	6,299	1,035
9	Vibrating Plate Compactor	compaction of soils for small-scale works on canal dikes	15kN, 500mmx525mm, 3.5kW, diesel engine	607	61	61	30	759	24 units	18,216	6.0	7	9,754	1,275
10	Tilting Drum Concrete Mixer	concrete works of canal lining and road pavement	diesel engine drive, 0.5m <sup>3</sup> wet capacity, 7.5kW, pneumatic tires, w/ mixing materials charging device, water measuring tank, pump & pipe	8,580	858	858	429	10,725	26 sets	278,850	9.5	9	176,888	25,097
11	Concrete Mixer Truck	construction of concrete canals and concrete roads	mixer capacity 1.6-1.7m <sup>3</sup> , 138kW	4,340	434	434	217	5,425	13 units	70,525	10.5	9	46,064	6,347
12	Concrete Pump Truck	construction of concrete canals and concrete roads	Boom type (15m boom), 30m <sup>3</sup> /hr, 103kW, w/mixer hopper	10,800	1,080	1,080	540	13,500	5 units	67,500	9.5	9	43,604	6,075
13	Semi-Trailer Truck	transport of heavy machineries	maximum loading capacity 25t, 235kW	15,600	1,560	1,560	780	19,500	5 units	97,500	12.0	8	66,248	7,800
14	Dump Truck	transport of soils	maximum loading capacity 4t, 135kW	4,300	430	430	215	5,375	14 units	75,250	11.0	12	49,771	9,030
15	Truck with Crane	transport and hoist of light machineries and concrete panels	maximum loading capacity 6t, crane capacity 2.9t, 132kW	7,980	798	798	399	9,975	4 units	39,900	12.0	7	27,159	2,793
16	Water Bowser	transport of water	5.5-6.5kl, 132kW	7,700	770	770	385	9,625	4 units	38,500	11.0	7	25,739	2,695
17	High Cycle Internal Concrete Vibrator and Frequency & Voltage Converter	compaction of concrete by removing air bubble in structures	frequency & voltage converter (input 230V, output 48V 200Hz), 3 extension codes (15m, 2.0mm <sup>2</sup> ) and 3 inner headers (φ32mm rod, 6m)	838	84	84	42	1,048	15 units	15,720	5.0	7	7,601	1,100
18	Engine Pump	drainage of large amount of mud water for temporary works	1m <sup>3</sup> /min at 10m total head, nominal diameter 100mm, maximum total head 24m, diesel engine 6.3kW	4,485	449	449	224	5,607	5 units	28,035	8.5	7	17,462	1,962
19	Submersible Sand Pump	drainage of small amount of mud water for temporary works	φ50mm, 2 poles, 0.8kW, single phase 230V/50Hz	200	20	20	10	250	20 units	5,000	10.5	7	3,252	350
20	Mobile Workshop	support of daily maintenance and repair of machineries and vehicles at sites	147kW, w/ hydraulic crane, engine generator/welder, oxygen-acetylene gas welder/cutter, air compressor, mechanic tools, electrical tools, lubricating tools, diesel engine service kit	18,700	1,870	1,870	935	23,375	2 sets	46,750	12.0	7	32,476	3,273
21	Workshop Equipment	support of daily maintenance and repair of machineries and vehicles at Construction No.2 Workshop in Pyay	electrical air compressor, portable hydraulic press, hydraulic pressure meter, portable dnf. mechanic tool set, etc.	5,000	-	500	250	5,750	1 set	5,750	5.0	-	3,000	-
22	Soil Mechanics and Concrete Testing Apparatus	Testing on civil construction materials by Irrigation Technology Centre (ITC) Pyay Laboratory	soil mechanics testing, concrete testing and others	15,000	-	1,500	750	17,250	1 set	17,250	2.0	-	-	-
23	4-Wheel Tractor	leveling works of plot farms and traction of concrete mixers	37.5kW, w/ dozer, disc plow and rotary	3,000	300	300	150	3,750	4 units	15,000	7.0	-	8,571	-
24	Combine Harvester	mechanization in model farms	52.2kW, w/ grain tank, tractor-driven trailer	4,000	400	400	200	5,000	2 units	10,000	7.0	-	5,714	-
25	Diesel Engine Generator, Small	power supply to submersible sand pump and inverter of high cycle internal concrete vibrator	rated output 2.7KVA, 3.4kW, single phase 230V/50Hz	342	34	34	17	427	15 units	6,405	10.0	6	4,125	384
26	Diesel Engine Generator, Large	gate operation for the Diversion Dam of South Nawn	rated output 125KVA, 134kW, Tier-2, three phase 400V/50Hz	6,220	622	622	311	7,775	1 units	7,775	10.0	6	5,349	467
								Total		2,002,749			1,275,430 (a)	217,480 (b)

Table 3.1.17 Project Cost Estimation (Financial / Economic) -Base 3 (Extension Service)

	2014年				2015年				2016年				2017年				2018年			
	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic
	FC	LC			FC	LC			FC	LC			FC	LC			FC	LC		
North Nawn	5,670,992		1.00	5,670,992	2,257,824		1.00	2,257,824	925,100		1.00	925,100								
LC																				
Total	6,236,887		1.00	6,236,887	1,997,549		1.00	1,997,549	860,771		1.00	860,771								
Material	1,292,000		0.95	1,228,400	71,246		0.99	70,633	65,919		0.99	65,306								
Skilled Labor	2,019,973		1.00	2,019,973	867,873		1.00	867,873	200,319		1.00	200,319								
Unskilled Labor	3,094,744		1.00	3,094,744	698,375		0.90	628,537	299,032		0.90	269,128								
South Nawn	1,392,200		1.00	1,392,200	4,306,827		1.00	4,306,827	4,569,260		1.00	4,569,260								
LC																				
Total	1,546,420		1.00	1,546,420	5,444,766		1.00	5,444,766	5,870,131		1.00	5,870,131								
Material	711,256		0.95	675,693	1,397,479		0.99	1,381,303	1,762,242		0.99	1,744,620								
Skilled Labor	414,440		1.00	414,440	744,047		1.00	744,047	1,416,642		1.00	1,416,642								
Unskilled Labor	414,440		1.00	414,440	1,069,041		0.90	962,675	1,687,197		0.90	1,511,336								
Wegyi									9,845,734		1.00	9,845,734								
LC																				
Total									10,830,468		1.00	10,830,468								
Material									3,119,240		0.99	3,087,920								
Skilled Labor									2,175,659		1.00	2,175,659								
Unskilled Labor									4,535,569		0.90	4,082,280								
Taung Nyo									2,855,500		1.00	2,855,500								
LC																				
Total									3,521,021		0.99	3,486,619								
Material									2,096,050		0.99	2,075,347								
Skilled Labor									1,100,095		1.00	1,100,095								
Unskilled Labor									314,876		0.90	283,187								
Sub Total(FC+LC)	7,262,790	7,073,007		13,335,797	8,567,863		1.00	8,567,863	11,204,243		1.00	11,204,243								
Machinery Procurement	4,914,204				8,571,266		1.00	8,571,266												
Engineering Service									147,835		0.99	146,377								
Engineering Service (E2)					2,838,040		1.00	2,838,040												
Engineering Service (S1)					75,824		0.99	75,236												
Engineering Service (S1)					1,142,140		1.00	1,142,140	1,142,140		1.00	1,142,140								
Engineering Service (S1)					290,710		0.99	286,773	290,710		0.99	286,773								
Total	13,176,994	7,073,007		20,250,001	19,416,129		1.00	19,416,129	21,427,783		1.00	21,427,783								
Physical Contingency	5%	668,650	303,652		972,302			972,302	321,675,300			321,675,300								
Project Management (FC+LC)	10%	706,219	337,304		1,043,523			1,043,523	3,682,144,300			3,682,144,300								
Sub-Total	14,451,472	7,713,963		21,163,824	20,410,054		1.00	20,410,054	22,111,427		1.00	22,111,427								
Grand Total(FC+LC)		13,816,133			20,410,054		1.00	20,410,054	22,111,427		1.00	22,111,427								
O&M	0.3%				60,753			60,753	203,926,300			203,926,300								
Technical Cooperation Project (Agriculture Extension)					996,274		1.00	996,274	1,347,969		1.00	1,347,969								
Technical Cooperation Project (Agriculture Extension)					426,333		0.99	422,069	530,930		0.99	525,121								
Technical Cooperation Project (Agriculture Extension)					299,941			299,941	211,039			211,039								

**Table 3.1.18 Project Cost and Benefit Estimation -Base 3 (Extension Service)**

Particulars	FC/LC	Total	Ratio %	2014	2015	2016	2017	2018	2019	2020	Remarks
<b>Implementation</b>											
<b>1 Civil &amp; Structure Construction</b>											
1.1 North Nawin	FC	8,853,517,000	49	5,670,592,000	2,257,825,000	925,100,000					
	LC	9,131,937,000	51	6,326,617,000	1,937,549,000	867,771,000					
	(unskilled labors)	4,012,079,000	44	3,014,741,000	698,325,000	299,013,000					
	Sub Total (FC+LC)	17,985,454,000	100	11,997,209,000	4,195,374,000	1,792,871,000	0				
1.2 South Nawin	FC	10,471,300,000	54	1,592,202,000	4,309,837,000	4,569,261,000					
	LC	8,871,117,000	46	1,546,420,000	3,444,566,000	3,880,131,000					
	(unskilled labors)	2,992,881,000	34	618,643,000	1,106,041,000	1,268,197,000					
	Sub Total (FC+LC)	19,342,417,000	100	3,138,622,000	7,754,403,000	8,449,392,000	0				
1.3 Wegyi	FC	25,984,725,000	56			9,945,784,000	8,589,769,000	7,449,172,000			
	LC	20,352,398,000	44			8,576,719,000	6,387,854,000	5,387,825,000			
	(unskilled labors)	6,379,155,000	31			3,248,790,000	1,667,300,000	1,463,065,000			
	Sub Total (FC+LC)	46,337,123,000	100			18,522,503,000	14,977,623,000	12,836,997,000			
1.4 Taung Nyo	FC	14,464,884,000	57			4,855,500,000	5,886,708,000	3,722,676,000			
	LC	10,841,082,000	43			3,527,821,000	4,531,506,000	2,781,755,000			
	(unskilled labors)	2,348,591,000	22			855,372,000	928,794,000	564,425,000			
	Sub Total (FC+LC)	25,305,966,000	100			8,383,321,000	10,418,214,000	6,504,431,000			
<b>Total of Civil &amp; Structure Construction</b>	FC	59,774,426,000	55	7,262,794,000	6,567,662,000	20,295,645,000	14,476,477,000	11,171,848,000			
	LC	49,196,534,000	45	7,873,037,000	5,382,115,000	16,852,442,000	10,919,360,000	8,169,580,000			
	(unskilled labors)	15,732,706,000	32	3,633,384,000	1,804,366,000	5,671,372,000	2,596,094,000	2,027,490,000			
	<b>Total (FC+LC)</b>	<b>108,970,960,000</b>	<b>100</b>	<b>15,135,831,000</b>	<b>11,949,777,000</b>	<b>37,148,087,000</b>	<b>25,395,837,000</b>	<b>19,341,428,000</b>			
<b>2 Machineries Procurement</b>	FC	14,785,510,000	99	5,914,204,000	8,871,306,000						
	LC	147,855,100	1		147,855,100						
	<b>Total (FC+LC)</b>	<b>14,933,365,100</b>	<b>100</b>	<b>5,914,204,000</b>	<b>9,019,161,100</b>	<b>0</b>	<b>0</b>				
<b>5 Engineering Service</b>		0									
5.1 Engineering Service (DD)	FC	2,838,040,000	80		2,838,040,000						
	LC	729,824,000	20		729,824,000						
	<b>Total (FC+LC)</b>	<b>3,567,864,000</b>	<b>100</b>		<b>3,567,864,000</b>	<b>0</b>	<b>0</b>				
5.2 Engineering Service (SV)	FC	4,326,290,000	80		1,142,140,000	1,142,140,000	1,142,140,000	899,870,000			
	LC	1,112,540,000	20		293,710,000	293,710,000	293,710,000	231,410,000			
	<b>Total (FC+LC)</b>	<b>5,438,830,000</b>	<b>100</b>		<b>1,435,850,000</b>	<b>1,435,850,000</b>	<b>1,435,850,000</b>	<b>1,131,280,000</b>			
<b>1.1 Total of 1.2.5 (FC)</b>	FC	81,724,266,000	61	13,176,998,000	19,419,148,000	21,437,785,000	15,618,617,000	12,071,718,000			
<b>1.2 Total of 1.2.5 (LC)</b>	LC	51,186,753,100	39	7,873,037,000	6,553,504,100	17,146,152,000	11,213,070,000	8,400,990,000			
<b>1.3 Total of 1.2.5 (Unskilled Labors)</b>	(unskilled labors)	15,732,706,000	31	3,633,384,000	1,804,366,000	5,671,372,000	2,596,094,000	2,027,490,000			
<b>1.4 Total of 1.2.5 (Grand Total)</b>	<b>Total (FC+LC)</b>	<b>132,911,019,100</b>	<b>100</b>	<b>21,050,035,000</b>	<b>25,972,652,100</b>	<b>38,583,937,000</b>	<b>26,831,687,000</b>	<b>20,472,708,000</b>			
2.1 Physical Contingency (5% of 1.1)	5% FC	4,086,213,300	61	658,849,900	970,957,400	1,071,889,250	780,930,850	603,585,900			
2.2 Physical Contingency (5% of 1.2)	5% LC	2,559,337,655	39	393,651,850	327,675,205	857,307,600	560,653,500	420,049,500			
2.3 Physical Contingency (5% of 1.3)	5% (unskilled labors)	786,635,300	31	181,669,200	90,218,300	283,568,600	129,804,700	101,374,500			
2.4 Physical Contingency (5% of 1.4)	5% <b>Total (FC+LC)</b>	<b>6,645,550,955</b>	<b>100</b>	<b>1,052,501,750</b>	<b>1,298,632,605</b>	<b>1,929,196,850</b>	<b>1,341,584,350</b>	<b>1,023,635,400</b>			
3.1 Total of 1.1 & 2.1	FC	85,810,479,300	61	13,835,847,900	20,390,105,400	22,509,674,250	16,399,547,850	12,675,303,900			
3.2 Total of 1.1 & 2.2	LC	53,746,090,755	39	8,266,688,850	6,881,179,305	18,003,459,600	11,773,723,500	8,821,039,500			
3.3 Total of 1.1 & 2.3	(unskilled labors)	16,519,341,300	31	3,815,053,200	1,894,584,300	5,954,940,600	2,725,898,700	2,128,864,500			
3.4 Total of 1.1 & 2.4	<b>Total (FC+LC)</b>	<b>139,556,570,055</b>	<b>100</b>	<b>22,102,536,750</b>	<b>27,271,284,705</b>	<b>40,513,133,850</b>	<b>28,173,271,350</b>	<b>21,496,343,400</b>			
4 Project Management (10% of 1)	10% LC	10,897,096,000	100	1,513,583,100	1,194,977,700	3,714,808,700	2,539,583,700	1,934,142,800			
5 Others (Miscellaneous, 5% of 1-2)	5% LC	5,744,258,200	100	1,052,501,750	597,488,850	1,857,404,350	1,269,791,850	967,071,400			
<b>6.1 Grand Total Cost for Project Evaluation</b>	FC	85,810,479,300	55	13,835,847,900	20,390,105,400	22,509,674,250	16,399,547,850	12,675,303,900			
<b>6.2 Grand Total Cost for Project Evaluation</b>	LC	70,387,444,955	45	10,832,773,700	8,673,645,855	23,575,672,650	15,583,099,050	11,722,253,700			
<b>6.3 Grand Total Cost for Project Evaluation</b>	<b>Total (FC+LC)</b>	<b>156,197,924,255</b>	<b>100</b>	<b>24,668,621,600</b>	<b>29,063,751,255</b>	<b>46,085,346,900</b>	<b>31,982,646,900</b>	<b>24,397,557,600</b>			
<b>7. Operation and Maintenance</b>	0.30% LC				63,150,105	126,056,919	237,501,180	313,688,691	371,712,975		371,712,975

Benefit												
1 Agriculture Production												
1.1 North Nawin												
1.1.1 Black Gram												
(a) Increase of Sawn Area (ac)												
(b) Gross Profit (kViac)												
(c) Input Cost (kViac)												
(d) Family Labor (kVac)												
(e) Hired Labor (kVac)												
(f) Unit Net Profit (kVac)												
(g) Net Profit (k)												
(h) Accumulated Net Profit (k)												
1.2 South Nawin												
1.2.1 Black Gram												
(a) Increase of Sawn Area (ac)												
(b) Gross Profit (kViac)												
(c) Input Cost (kViac)												
(d) Family Labor (kVac)												
(e) Hired Labor (kVac)												
(f) Unit Net Profit (kVac)												
(g) Net Profit (k)												
(h) Accumulated Net Profit (k)												
1.3 Weegy												
1.3.1 Black Gram												
(a) Increase of Sawn Area (ac)												
(b) Gross Profit (kViac)												
(c) Input Cost (kViac)												
(d) Family Labor (kVac)												
(e) Hired Labor (kVac)												
(f) Unit Net Profit (kVac)												
(g) Net Profit (k)												
(h) Accumulated Net Profit (k)												
1.4 raung Nyo												
1.4.1 Black Gram												
(a) Increase of Sawn Area (ac)												
(b) Gross Profit (kViac)												
(c) Input Cost (kViac)												
(d) Family Labor (kVac)												
(e) Hired Labor (kVac)												
(f) Unit Net Profit (kVac)												
(g) Net Profit (k)												
(h) Accumulated Net Profit (k)												
Sub-Total of Crop Benefit (k)												
1 Road Improvement												
1.1 North Nawin												
1.1.1 Monsoon Paddy for threshing												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (k)												
(c) Cost after Rehabilitation (k)												
(d) Net Profit (k)												
1.1.2 Summer Paddy for threshing												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (k)												
(c) Cost after Rehabilitation (k)												
(d) Net Profit (k)												
1.1.3 Improvement of Tractor/Tractor Driving Condition												
(a) Monsoon Paddy Cultivation (kyat)												
(b) Summer Paddy Cultivation (kyat)												
(c) Black Gram Cultivation (kyat)												
(d) Accumulation above (kyat)												
1.2 South Nawin												
1.2.1 Monsoon Paddy												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (k)												
(c) Cost after Rehabilitation (k)												
(d) Net Profit (k)												
1.2.2 Summer Paddy												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (k)												
(c) Cost after Rehabilitation (k)												
(d) Net Profit (k)												
1.2.3 Improvement of Tractor/Tractor Driving Condition												
(a) Monsoon Paddy Cultivation (kyat)												
(b) Summer Paddy Cultivation (kyat)												
(c) Black Gram Cultivation (kyat)												
(d) Accumulation above (kyat)												
1.3 Weegy												
1.3.1 Monsoon Paddy												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (k)												
(c) Cost after Rehabilitation (k)												
(d) Net Profit (k)												
1.3.2 Summer Paddy												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (k)												
(c) Cost after Rehabilitation (k)												
(d) Net Profit (k)												
1.3.3 Improvement of Tractor/Tractor Driving Condition												
(a) Monsoon Paddy Cultivation (kyat)												
(b) Summer Paddy Cultivation (kyat)												
(c) Black Gram Cultivation (kyat)												
(d) Accumulation above (kyat)												
1.4 raung Nyo												
1.4.1 Monsoon Paddy												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (k)												
(c) Cost after Rehabilitation (k)												
(d) Net Profit (k)												
1.4.2 Summer Paddy												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (k)												
(c) Cost after Rehabilitation (k)												
(d) Net Profit (k)												
1.4.3 Improvement of Tractor/Tractor Driving Condition												
(a) Monsoon Paddy Cultivation (kyat)												
(b) Summer Paddy Cultivation (kyat)												
(c) Black Gram Cultivation (kyat)												
(d) Accumulation above (kyat)												
Sub-total of Road Improve Benefit (k)												
Total (Base Case Financial)												



Table 3.1.19 Cost Breakdown for Technical Cooperation Project (Agriculture Extension)

		Unit	Qty.	Foreign Portion		Local Portion		Combined Total ('000) Yen
				(Yen)		Kyat		
				Rate	Amount ('000)	Rate	Amount ('000)	
<b>A</b>	<b>Remuneration (International)</b>							
1	Chief Advisor	M/M	55	2,753,000	151,415			151,415
2	Agriculture (paddy)	M/M	32	2,753,000	88,096			88,096
3	Agriculture (pulses, sesame)	M/M	20	2,753,000	55,060			55,060
4	Farm Mechanization	M/M	15	2,753,000	41,295			41,295
5	Post Harvest	M/M	10	2,753,000	27,530			27,530
6	Training / Coordinator	M/M	46	2,753,000	126,638			126,638
7	Irrigation Water Management	M/M	20	2,753,000	55,060			55,060
	Sub-total of A		198		545,094		0	545,094
<b>B</b>	<b>Counterpart Personnel</b>							
1	Agriculture (crops)	M/M	60			1,147,000	68,820	6,882
2	Agriculture (extension)	M/M	60			1,147,000	68,820	6,882
3	Farm Mechanization	M/M	36			1,147,000	41,292	4,129
4	Post Harvest	M/M	36			1,147,000	41,292	4,129
5	Irrigation Water Management	M/M	36			1,147,000	41,292	4,129
	Sub-total of B		228		0		261,516	26,152
<b>C</b>	<b>Direct Cost</b>							
1	International Airfare	Trip	17	350,000	5,950			5,950
2	Training (Out Country)	Person	50	700,000	35,000			35,000
3	Accommodation Allowance	M/M	198			3,924,000	776,952	77,695
4	Vehicle Rental	Month	118			2,492,500	294,115	29,412
5	Office Equipment, furniture, consumable	M/M	198			250,000	49,500	4,950
6	International Communications	M/M	198			100,000	19,800	1,980
7	Domestic Communications	M/M	198			50,000	9,900	990
8	Report Preparation	Year	5			2,000,000	10,000	1,000
9	Training (agriculture extension)	Batch	25			10,000,000	250,000	25,000
10	Extension Operation (fuel, allowance)	Month	59			6,000,000	354,000	35,400
11	Extension Camp Establishment	Places	100			5,000,000	500,000	50,000
	Subtotal of C				40,950		2,264,267	267,377
	<b>Total</b>				<b>5,860,440</b>		<b>2,525,783</b>	<b>838,623</b>
<b>Allocation by Year (Based on Yearly MM)</b>				<b>Foreign Portion</b>		<b>Local Portion</b>		<b>Total</b>
				<b>(Kyat)</b>		<b>(Kyat)</b>		<b>('000)</b>
1st year (2015)	%	17%			996,275		429,383	142,566
2nd year (2016)	%	23%			1,347,901		580,930	192,883
3rd year (2017)	%	20%			1,172,088		505,157	167,725
4th year (2018)	%	21%			1,230,692		530,414	176,111
5th year (2019)	%	16%			937,670		404,125	134,180
6th year (2020)	%	3%			175,813		75,773	25,159
<b>Total</b>					<b>5,860,439</b>		<b>2,525,782</b>	<b>838,624</b>

Table 3.1.20 Project Benefit Estimation -Base3 (Extension Service)

x	2015			2016			2017			2018			2019		
	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic
1. Agriculture Production															
1.1 North Nawin															
1.1.1 Black Gram															
(a) Increase of Sawn Area (ac)	10,192.16		10,192	15,178.42		15,178.42	0	0.00	0	0	0.00	0	0	0.00	0
(b) Gross Profit (K/ha)	328,000	1.07	350,960	328,000	1.07	350,960									
(c) Input Cost (K/ha)	37,086	0.77	28,556	37,086	0.77	28,556									
(d) Family Labor (K/ha)	28,258	0.60	16,955	28,258	0.60	16,955									
(e) Hired Labor (K/ha)	36,535	0.60	21,921	39,441	0.60	23,665									
(f) Unit Net Profit (K/ha)	226,121		283,528	223,215		281,784									
(g) Net Profit (K)	2,304,661.411		2,889,717.376	3,388,051.020		4,277,035.901									
(h) Accumulated Net Profit (K)	2,304,661.411		2,889,717.376	5,692,712.431		7,166,753.277	5,692,712.431		7,166,753.277	5,692,712.431		7,166,753.277	5,692,712.431		7,166,753.277
1.2 South Nawin															
1.2.1 Black Gram															
(a) Increase of Sawn Area (ac)	17,608.66		17,608.66	22,141.91		22,141.91	18,705.22		18,705.22	0	0.00	0	0	0.00	0
(b) Gross Profit (K/ha)	250,167	1.07	267,679	250,167	1.07	267,679	250,167	1.07	267,679						
(c) Input Cost (K/ha)	38,684	0.77	29,787	38,684	0.77	29,787	38,684	0.77	29,787						
(d) Family Labor (K/ha)	26,176	0.60	15,706	26,176	0.60	15,706	26,176	0.60	15,706						
(e) Hired Labor (K/ha)	36,535	0.60	21,921	36,535	0.60	21,921	36,535	0.60	21,921						
(f) Unit Net Profit (K/ha)	148,772		200,265	148,772		200,265			200,265						
(g) Net Profit (K)	2,619,675.566		3,526,398.295	3,294,096.235		4,434,249.606	2,782,812.990		3,746,000.883						
(h) Accumulated Net Profit (K)	2,619,675.566		3,526,398.295	5,913,771.801		7,960,647.901	8,696,584.791		11,706,648.784	8,696,584.791		11,706,648.784	8,696,584.791		11,706,648.784
1.3 Weyga															
1.3.1 Black Gram															
(a) Increase of Sawn Area (ac)							2,268.72		2,268.72	0.00		0.00	433.17		433.17
(b) Gross Profit (K/ha)							250,167	1.07	267,679	328,000	1.07	350,960	153,494	1.07	164,239
(c) Input Cost (K/ha)							38,684.00	0.77	29,787	37,086	0.77	28,556	15,476	0.77	11,917
(d) Family Labor (K/ha)							26,176	0.60	15,706	28,258	0.60	16,955	26,644	0.60	15,986
(e) Hired Labor (K/ha)							36,535.00	0.60	21,921	39,441	0.60	23,665	37,188	0.60	22,313
(f) Unit Net Profit (K/ha)							148,772		200,265	223,215		281,784	74,186		114,023
(g) Net Profit (K)							337,522.012		454,345.211	0		32,135.150	49,391.343		49,391.343
(h) Accumulated Net Profit (K)							337,522.012		454,345.211	337,522.012		454,345.211	369,657.162		503,736.554
1.4 Taung Nyo															
1.4.1 Black Gram															
(a) Increase of Sawn Area (ac)							9,104.47		9,104.47	10,683.44		10,683.44	0.00		0.00
(b) Gross Profit (K/ha)							250,167	1.07	267,679	328,000	1.07	350,960	0	1.07	0
(c) Input Cost (K/ha)							38,684	0.77	29,787	37,086	0.77	28,556	0	0.77	0
(d) Family Labor (K/ha)							26,176	0.60	15,706	28,258	0.60	16,955	0	0.60	0
(e) Hired Labor (K/ha)							36,535	0.60	21,921	39,441	0.60	23,665	0	0.60	0
(f) Unit Net Profit (K/ha)							148,772		200,265	223,215		281,784	0		0
(g) Net Profit (K)							1,354,490.211		1,823,306.685	2,384,704.060		3,010,422.457	0		0
(h) Accumulated Net Profit (K)							1,354,490.211		1,823,306.685	3,739,194.271		4,833,729.142	3,739,194.271		4,833,729.142
Sub-Total (Base Case, Financial)	4,924,336,977		6,416,115,671	11,606,484,232		15,127,401,178	16,081,309,445		21,151,053,957	18,466,013,505		24,161,476,414	18,498,148,655		24,210,867,757
Yield Increase (Black Gram)				710,563,489		883,939,781	1,421,126,978		1,767,879,563	2,131,690,468		2,651,819,347	2,842,253,957		3,535,759,129
Yield Increase by 15% <sup>1</sup>				556,846,018		445,907,943	1,113,692,035		891,815,889	1,670,538,051		1,337,723,831	2,227,384,069		1,783,631,775
Yield Increase by 13% <sup>1</sup>				81,338,388		50,508,693	162,676,776		101,017,387	244,015,163		151,526,079	326,845,393		202,034,776
G-Total	4,924,336,977		6,416,115,671	12,955,232,127		16,507,757,595	18,778,805,234		23,911,766,796	22,512,257,187		28,302,545,671	23,894,632,074		29,732,293,437

Benefit	2016			2017			2018			2019		
	Financial cost	Conversion Factor	Economic cost	Financial cost	Conversion Factor	Economic cost	Financial cost	Conversion Factor	Economic cost	Financial cost	Conversion Factor	Economic cost
<b>1. Road Improvement</b>												
<b>1.1 North Nawin</b>												
1.1.1 Monsoon Paddy												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (kt)												
(c) Cost after Rehabilitation (Kt)												
(d) Net Profit (Kt)												
1.1.2 Summer Paddy												
(a) Area Improved (ac)	2,998		2,998	0		0	0		0	0		0
(b) Cost before Rehabilitation (kt)	179,906,400	0.99	178,107,336	0	0.99	0	0	0.99	0	0	0.99	0
(c) Cost after Rehabilitation (Kt)	63,515,955	0.99	62,880,795	0	0.99	0	0	0.99	0	0	0.99	0
(d) Net Profit (Kt)	116,390,445		115,226,541	159,497,888		115,226,541	159,497,888		115,226,541	159,497,888		115,226,541
1.1.3 Improvement of Trolleergy Driving												
(a) Monsoon Paddy Cultivation (kyat)	9,551,109	0.99	9,455,598	3,537,447	0.99	3,502,073						
(b) Summer Paddy Cultivation (kyat)	1,688,122	0.99	1,671,241	625,228	0.99	618,976						
(c) Black Gram Cultivation (kyat)	12,939,351	0.99	12,809,957	4,792,358	0.99	4,744,434						
(d) Sub-total of Trolleergy Driving (kyat)	24,178,582		23,936,796	8,955,033		8,865,483			0			0
(e) Accumulation of Trolleergy (kyat)	24,178,582		23,936,796	33,133,615		32,802,279	33,133,615		32,802,279	33,133,615		32,802,279
<b>1.2 South Nawin</b>												
1.2.1 Monsoon Paddy												
(a) Area Improved (ac)												
(b) Cost before Rehabilitation (kt)												
(c) Cost after Rehabilitation (Kt)												
(d) Net Profit (Kt)												
1.2.2 Summer Paddy												
(a) Area Improved (ac)	2,245		2,245	1,464		1,464	0		0	0		0
(b) Cost before Rehabilitation (kt)	134,729,400	0.99	133,382,106	87,867,000	0.99	86,988,330	0	0.99	0	0	0.99	0
(c) Cost after Rehabilitation (Kt)	47,566,215	0.99	47,090,553	31,021,444	0.99	30,711,230	0	0.99	0	0	0.99	0
(d) Net Profit (Kt)	87,163,185		86,291,553	144,008,741		142,568,653	144,008,741		86,291,553	144,008,741		86,291,553
1.2.3 Improvement of Trolleergy Driving												
(a) Monsoon Paddy Cultivation (kyat)	13,488,602	0.99	13,488,602	8,796,914	0.99	8,708,945	0	0.99	0	0		0
(b) Summer Paddy Cultivation (kyat)	1,264,211	0.99	1,251,569	824,485	0.99	816,240	0	0.99	0	0		0
(c) Black Gram Cultivation (kyat)	28,326,064	0.99	28,042,803	18,473,520	0.99	18,288,785	0	0.99	0	0		0
(d) Sub-total of Trolleergy Driving (kyat)	43,078,877		42,782,974	28,094,919		27,813,970	0		0	0		0
(e) Accumulation of Trolleergy (kyat)	43,078,877		42,782,974	71,173,796		70,596,944	71,173,796		70,596,944	71,173,796		70,596,944
<b>1.3 Wegyi</b>												
1.3.1 Monsoon Paddy												
(a) Area Improved (ac)			13,413			13,413			5,412			5,412
(b) Cost before Rehabilitation (kt)			934,966,937	0.99		925,617,268	377,267,324	0.99	373,494,651	377,267,324	0.99	373,494,651
(c) Cost after Rehabilitation (Kt)			284,135,840	0.99		281,294,482	114,651,293	0.99	113,504,780	114,651,293	0.99	113,504,780
(d) Net Profit (Kt)			650,831,097			644,322,786	913,447,128		904,312,657	913,447,128		904,312,657
1.3.2 Summer Paddy												
(a) Area Improved (ac)			773			773			5,421			1,603
(b) Cost before Rehabilitation (kt)			46,358,400	0.99		45,894,816	325,233,000	0.99	321,980,670	96,174,600	0.99	95,212,854
(c) Cost after Rehabilitation (Kt)			16,366,833	0.99		16,203,165	114,823,511	0.99	113,675,276	33,954,443	0.99	33,614,899
(d) Net Profit (Kt)			29,991,567			29,691,651	240,401,056		237,997,045	302,621,213		299,595,000
1.3.3 Improvement of Trolleergy Driving												
(a) Monsoon Paddy Cultivation (kyat)			7,551,739	0.99		7,476,222	3,047,192	0.99	3,016,720	30,618,220	0.99	30,312,038
(b) Summer Paddy Cultivation (kyat)			434,996	0.99		430,646	3,051,770	0.99	3,021,252	5,878,593	0.99	5,819,807
(c) Black Gram Cultivation (kyat)			10,348,045	0.99		10,244,565	4,175,529	0.99	4,133,774	3,458,976	0.99	3,424,386
(d) Sub-total of Trolleergy Driving (kyat)			18,334,780			18,151,433	10,274,491		10,171,746	39,955,789		39,556,231
(e) Accumulation of Trolleergy (kyat)			18,334,780			18,151,433	28,609,271		28,323,179	68,565,060		67,879,410
<b>1.4 Taung Nyo</b>												
1.4.1 Monsoon Paddy												
(a) Area Improved (ac)			16,500			16,500	10,234		10,234	0		0
(b) Cost before Rehabilitation (kt)			1,150,099,271	0.99		1,138,598,278	713,320,066	0.99	706,186,865	0		0
(c) Cost after Rehabilitation (Kt)			349,514,416	0.99		346,019,272	216,777,501	0.99	214,609,726	0		0
(d) Net Profit (Kt)			800,584,855			792,579,006	1,297,127,420		1,284,156,145	1,297,127,420		1,284,156,145
1.4.2 Summer Paddy												
(a) Area Improved (ac)			1,325			1,325	1,157		1,157	0		0
(b) Cost before Rehabilitation (kt)			79,498,200	0.99		78,703,218	69,405,600	0.99	68,711,544	0	0.99	0
(c) Cost after Rehabilitation (Kt)			28,066,840	0.99		27,786,172	24,503,647	0.99	24,258,611	0	0.99	0
(d) Net Profit (Kt)			51,431,360			50,917,046	96,333,313		95,369,979	96,333,313		95,369,979
1.4.3 Improvement of Trolleergy Driving												
(a) Monsoon Paddy Cultivation (kyat)			9,289,365	0.99		9,196,471	5,761,494	0.99	5,703,879	0		0
(b) Summer Paddy Cultivation (kyat)			745,958	0.99		738,498	651,256	0.99	644,743	0		0
(c) Black Gram Cultivation (kyat)			19,507,666	0.99		19,312,589	12,099,138	0.99	11,978,147	0		0
(d) Sub-total of Trolleergy Driving (kyat)			29,542,989			29,247,558	18,511,888		18,326,769	0		0
(e) Accumulation of Trolleergy (kyat)			29,542,989			29,247,558	48,054,877		47,574,327	48,054,877		47,574,327
<b>Sub-total of Road Improve Benefit (kt)</b>	<b>270,811,089</b>		<b>268,237,864</b>	<b>1,988,530,688</b>		<b>1,926,103,897</b>	<b>3,031,787,105</b>		<b>2,902,650,649</b>	<b>3,133,963,051</b>		<b>3,003,804,835</b>
<b>Total (Base Case Financial)</b>	<b>5,195,148,066</b>		<b>6,684,353,535</b>	<b>13,595,014,920</b>		<b>17,053,505,075</b>	<b>19,113,096,550</b>		<b>24,053,704,606</b>	<b>21,599,976,556</b>		<b>27,165,281,249</b>

**Table 3.1.21 Financial Cost and Benefit Analyses (Base3) (Extension Service)**

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	FIRR =		17.0%		B/C =		1.34	
						Present Value Factor	Present Value		Present Value	Present Value			
							Discount Rate	17.0%		Discount Rate	12.0%		
	Investment	O & M	Total	Total		Cost	Benefit		Cost	Benefit			
1	23,616,120,000		23,616,120,000	0	-23,616,120,000	0.85470	20,184,697,764	0	0.89286	21,085,888,903	0		
2	29,891,920,000	63,150,000	29,955,070,000	4,924,336,977	-25,030,733,023	0.73051	21,882,478,186	3,597,277,405	0.79719	23,879,882,253	3,925,632,195		
3	46,156,774,000	141,068,061	46,297,842,061	12,955,232,127	-33,342,609,934	0.62437	28,906,983,648	8,088,858,283	0.71178	32,953,878,022	9,221,275,123		
4	25,511,391,000	256,819,872	25,768,210,872	18,778,805,234	-6,989,405,638	0.53365	13,751,205,732	10,021,309,413	0.63552	16,376,213,373	11,934,306,302		
5	25,511,391,000	337,314,933	25,848,705,933	22,512,257,187	-3,336,448,746	0.45611	11,789,853,263	10,268,065,626	0.56743	14,667,331,208	12,774,130,096		
6	1,341,795,000	337,314,933	1,679,109,933	23,894,632,074	22,215,522,141	0.38984	654,584,216	9,315,083,368	0.50663	850,687,465	12,105,737,448		
7	251,586,000	337,314,933	588,900,933	25,254,056,952	24,665,156,019	0.33320	196,221,791	8,414,651,776	0.45235	266,389,337	11,423,672,662		
8		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.28478	96,060,547	7,191,850,339	0.40388	136,234,755	10,199,608,522		
9		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.24340	82,102,455	6,146,837,462	0.36061	121,639,138	9,106,865,477		
10		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.20804	70,174,999	5,253,854,008	0.32197	108,605,289	8,131,048,717		
11		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.17781	59,977,968	4,490,423,867	0.28748	96,971,297	7,260,036,293		
12		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.15197	51,261,750	3,837,859,035	0.25668	86,581,997	6,482,211,338		
13		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.12989	43,813,837	3,280,249,457	0.22917	77,302,463	5,787,472,232		
14		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.11102	37,448,704	2,803,705,403	0.20462	69,021,382	5,167,485,134		
15		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.09489	32,007,814	2,396,357,464	0.18270	61,627,438	4,613,916,205		
16		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.08110	27,356,241	2,048,104,019	0.16312	55,022,812	4,119,441,770		
17		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.06932	23,382,671	1,750,611,228	0.14564	49,126,547	3,678,000,854		
18		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.05925	19,985,910	1,496,302,874	0.13004	43,864,434	3,284,037,566		
19		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.05064	17,081,628	1,278,865,444	0.11611	39,165,637	2,932,248,553		
20		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.04328	14,598,990	1,092,995,585	0.10367	34,969,439	2,618,088,084		
21		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.03699	12,477,279	934,147,567	0.09256	31,221,870	2,337,515,511		
22		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.03162	10,665,898	798,533,281	0.08264	27,875,706	2,086,995,267		
23		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.02702	9,114,249	682,364,619	0.07379	24,890,469	1,863,496,862		
24		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.02310	7,791,975	583,368,716	0.06588	22,222,308	1,663,737,272		
25		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.01974	6,658,597	498,515,084	0.05882	19,840,864	1,485,443,630		
26		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.01687	5,690,503	426,035,941	0.05252	17,715,780	1,326,343,071		
27		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.01442	4,864,081	364,163,501	0.04689	15,816,697	1,184,162,730		
28		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.01233	4,159,093	311,382,522	0.04187	14,123,376	1,057,387,365		
29		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.01053	3,551,926	265,925,220	0.03738	12,608,832	943,996,649		
30		337,314,933	337,314,933	25,254,056,952	24,916,742,019	0.00900	3,035,834	227,286,513	0.03338	11,259,572	842,980,421		
Total	152,280,977,000	9,231,226,191	161,512,203,191		527,650,427,256		98,009,287,549	97,864,985,020		111,257,978,663	149,557,273,349		

**Table 3.1.22 Economic Cost and Benefit Analyses (Base2) (Extension Service)**

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	FIRR = Present Value Factor	22.8%		B/C = Present Value	1.73		
							Present Value			Present Value	Present Value	
							Discount Rate	22.8%			Discount Rate	12.0%
1	21,924,003,000		21,924,003,000	0	-21,924,003,000	0.81433	17,853,373,363	0	0.89286	19,575,065,319	0	
2	25,279,484,000	63,150,000	25,342,634,000	6,416,115,671	-18,926,518,329	0.66314	16,805,714,311	4,254,782,946	0.79719	20,202,894,398	5,114,863,252	
3	43,454,167,000	141,068,061	43,595,235,061	16,507,757,595	-27,087,477,466	0.54001	23,541,862,885	8,914,354,179	0.71178	31,030,216,412	11,749,891,701	
4	31,272,658,000	256,819,872	31,529,477,872	23,911,766,796	-7,617,711,076	0.43975	13,865,087,894	10,515,199,449	0.63552	20,037,613,777	15,196,406,034	
5	24,515,345,000	337,314,933	24,852,659,933	28,302,545,671	3,449,885,738	0.35810	8,899,737,522	10,135,141,605	0.56743	14,102,144,826	16,059,713,490	
6	1,337,754,000	337,314,933	1,675,068,933	29,732,293,437	28,057,224,504	0.29161	488,466,852	8,670,234,089	0.50663	848,640,174	15,063,271,824	
7	250,828,000	337,314,933	588,142,933	31,112,649,856	30,524,506,923	0.23747	139,666,302	7,388,320,961	0.45235	266,046,456	14,073,807,162	
8		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.19338	65,229,962	6,016,564,229	0.40388	136,234,755	12,565,777,024	
9		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.15748	53,120,356	4,899,620,099	0.36061	121,639,138	11,219,532,665	
10		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.12824	43,257,267	3,989,886,218	0.32197	108,605,289	10,017,339,874	
11		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.10443	35,225,798	3,249,094,024	0.28748	96,971,297	8,944,264,581	
12		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.08504	28,685,262	2,645,819,744	0.25668	86,581,997	7,985,994,965	
13		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.06925	23,359,059	2,154,551,003	0.22917	77,302,463	7,130,085,967	
14		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.05639	19,021,189	1,754,442,325	0.20462	69,021,382	6,366,270,414	
15		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.04592	15,489,502	1,428,692,881	0.18270	61,627,438	5,684,281,129	
16		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.03740	12,615,578	1,163,613,105	0.16312	55,022,812	5,075,095,445	
17		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.03045	10,271,240	947,380,188	0.14564	49,126,547	4,531,246,325	
18		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.02480	8,365,410	771,593,716	0.13004	43,864,434	4,045,888,987	
19		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.02019	6,810,388	628,164,401	0.11611	39,165,637	3,612,489,775	
20		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.01644	5,545,457	511,491,964	0.10367	34,969,439	3,225,448,411	
21		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.01339	4,516,647	416,598,382	0.09256	31,221,870	2,879,786,871	
22		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.01091	3,680,106	339,439,010	0.08264	27,875,706	2,571,149,384	
23		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.00888	2,995,357	276,280,331	0.07379	24,890,469	2,295,802,433	
24		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.00723	2,438,787	224,944,458	0.06588	22,222,308	2,049,701,373	
25		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.00589	1,986,785	183,253,508	0.05882	19,840,864	1,830,046,065	
26		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.00480	1,619,112	149,340,719	0.05252	17,715,780	1,634,036,370	
27		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.00391	1,318,901	121,650,461	0.04689	15,816,697	1,458,872,152	
28		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.00318	1,072,661	98,938,227	0.04187	14,123,376	1,302,686,649	
29		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.00259	873,646	80,581,763	0.03738	12,608,832	1,162,990,852	
30		337,314,933	337,314,933	31,112,649,856	30,775,334,923	0.00211	711,735	65,647,691	0.03338	11,259,572	1,038,540,252	
Total	148,034,239,000	9,231,226,191	157,265,465,191		694,308,610,523		81,942,119,334	81,995,621,676		107,240,329,464	185,885,281,426	
							NPV =	53,502,342		NPV =	78,644,951,962	

**Table 3.1.23 Cost and Benefit of Crops (M-paddy) per Ace / Season**

Yield increase by		15%	
Area not changed			
Year	W/O P	W/ P	Increment
2017	18,561,533,908	19,118,379,926	556,846,018
2018	18,561,533,908	19,675,225,943	1,113,692,035
2019	18,561,533,908	20,232,071,959	1,670,538,051
2020	18,561,533,908	20,788,917,977	2,227,384,069
2021	18,561,533,908	21,345,763,995	2,784,230,087

**Table 3.1.24 Cost and Benefit of Crops (M-paddy) per Ace / Season (Estimation)**

Crop	Monsoon Paddy								
	Upper Position			Middle Position			Lower Position		
	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic
Gross Profit	210,859	0.78	164,470	179,357	0.78	139,898	225,404	0.78	175,815
Input Cost	35,846	0.77	27,601	30,491	0.77	23,478	38,319	0.77	29,506
Labor Cost									
Family Labor	30,097	0.6	18,058	27,718	0.6	16,631	30,010	0.6	18,006
Hired Labor	54,723	0.6	32,834	50,396	1.0	50,396	54,564	1.0	54,564
Net Profit	90,193		85,977	70,752		49,393	102,511		73,739
Total(Kyat/ac)	90,193		85,977	70,752		49,393	102,511	0.00	73,739

**Table 3.1.25 Crop: Monsoon Paddy (Financial Price) ( Estimation)**

Activities	Without Project			2016			2017			2018			2019			2020		
	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position
<b>North Nawin</b>	27 679 15	25 489 99																
(A) Gross Profit	5 836 397 899	4 571 700 522																
(B) Procurement Cost																		
Input Cost	992 186 811	777 196 990																
Family Labor	833 059 378	706 514 912																
Hired Labor	1 514 686 125	1 284 563 296																
(C) Net Profit	2 496 465 576	1 803 425 322																
<b>Total (Kyat/ac)</b>	2 496 465 576	1 803 425 322		2 571 399 543	1 957 928 082		2 645 253 511	1 911 630 841		2 721 147 478	1 965 733 601		2 796 041 445	2 019 935 361		2 870 935 412	2 073 939 120	
<b>South Nawin</b>	26 886 33	23 949 00	21 872 73															
(A) Gross Profit	5 699 224 657	4 295 528 407	4 936 200 833															
(B) Procurement Cost																		
Input Cost	953 767 385	730 247 254	838 141 141															
Family Labor	806 197 874	653 835 013	656 400 627															
Hired Labor	1 471 300 637	1 206 364 042	1 193 463 640															
(C) Net Profit	2 424 958 761	1 894 482 088	2 242 195 425															
<b>Total (Kyat/ac)</b>	2 424 958 761	1 894 482 088	2 242 195 425	2 497 707 524	1 745 316 551	2 309 451 288	2 570 456 287	1 796 151 024	2 376 727 151	2 643 205 049	1 846 985 487	2 443 993 013	2 715 953 812	1 897 819 960	2 511 258 076	2 788 702 575	1 948 654 413	2 578 524 739
<b>Wegyi</b>	19 455 36	10 096 25	10 876 81															
(A) Gross Profit	4 102 337 754	1 810 833 111	2 451 676 481															
(B) Procurement Cost																		
Input Cost	697 396 835	307 644 789	416 788 482															
Family Labor	585 547 910	279 847 858	326 413 068															
Hired Labor	1 064 655 665	508 810 615	593 482 261															
(C) Net Profit	1 754 737 284	714 329 879	1 114 992 670															
<b>Total (Kyat/ac)</b>	1 754 737 284	714 329 879	1 114 992 670	1 807 379 403	735 759 775	1 148 442 450	1 860 021 521	757 186 672	1 181 892 230	1 912 663 648	718 619 568	1 215 342 010	1 965 305 758	800 049 464	1 248 791 790	2 017 947 377	821 479 361	1 292 241 571
<b>Taung Nyo</b>	16 611 77	18 988 74	14 380 80															
(A) Gross Profit	3 502 741 210	3 405 763 440	3 241 489 843															
(B) Procurement Cost																		
Input Cost	565 465 507	578 985 871	551 057 875															
Family Labor	499 964 442	526 329 895	421 567 808															
Hired Labor	909 045 890	656 556 541	784 673 071															
(C) Net Profit	1 498 265 371	1 343 491 333	1 474 190 189															
<b>Total (Kyat/ac)</b>	1 498 265 371	1 343 491 333	1 474 190 189	1 543 213 332	1 383 796 073	1 518 415 895	1 588 161 293	1 424 100 813	1 562 641 600	1 633 109 254	1 464 405 553	1 606 867 306	1 678 057 216	1 504 710 293	1 651 093 012	1 723 005 177	1 545 015 033	1 685 318 717
<b>Incremental Achievement</b>				20%			40%			60%			80%			100%		
<b>Grand Total</b>	8 174 426 912	5 555 728 632	4 831 378 284	8 419 659 802	5 722 400 491	4 976 319 633	8 664 892 612	5 889 072 350	5 121 210 981	8 916 125 421	6 055 744 209	5 266 202 329	9 155 358 231	6 222 416 066	5 411 143 678	9 400 591 041	6 389 087 927	5 556 085 027

**Table 3.1.26 Crop: Monsoon Paddy (Economic Price) ( Estimation)**

Activities	Without Project			2017			2018			2019			2020			2021		
	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position
<b>North Nawin</b>	27 679 15	25 489 39	-															
<b>(A) Gross Profit</b>	4 552 389 801	3 555 914 682	-															
<b>(B) Procurement Cost</b>																		
Input Cost	763 972 219	598 439 898	-															
Family Labor	498 830 091	706 514 912	-															
Hired Labor	908 817 211	1 284 563 298	-															
<b>(C) Net Profit</b>	2 379 770 280	976 396 574	-															
<b>Total(Kya/ha)</b>				2 451 163 388	1 005 688 471		2 522 556 497	1 034 980 368		2 593 949 605	1 064 272 265		2 665 342 714	1 083 584 163		2 736 735 822	1 122 856 060	
<b>South Nawin</b>	26 886 33	23 946 60	21 872 73															
<b>(A) Gross Profit</b>	4 421 994 695	3 350 501 141	3 845 554 025															
<b>(B) Procurement Cost</b>																		
Input Cost	742 089 594	562 288 709	645 376 771															
Family Labor	485 513 347	396 305 798	393 840 376															
Hired Labor	862 785 759	1 206 984 042	1 193 463 640															
<b>(C) Net Profit</b>	2 311 605 995	1 182 942 592	1 612 873 298															
<b>Total(Kya/ha)</b>	2 311 605 995	1 182 942 592	1 612 873 298	2 380 954 175	1 218 430 870	1 661 250 435	2 450 302 355	1 253 919 148	1 709 648 632	2 519 650 535	1 289 407 425	1 758 031 829	2 668 996 714	1 324 895 703	1 806 418 027	2 658 346 894	1 360 383 981	1 854 904 224
<b>Wegyi</b>	19 455 36	10 096 25	10 878 91															
<b>(A) Gross Profit</b>	3 199 823 059	1 412 445 163	1 912 306 350															
<b>(B) Procurement Cost</b>																		
Input Cost	536 987 391	237 039 758	320 931 156															
Family Labor	351 324 891	157 910 734	195 947 841															
Hired Labor	638 797 290	508 810 615	593 482 261															
<b>(C) Net Profit</b>	1 672 713 487	498 584 076	802 045 092															
<b>Total(Kya/ha)</b>	1 672 713 487	498 584 076	802 045 092	1 722 864 892	513 644 368	826 106 445	1 773 076 295	528 685 121	850 167 798	1 823 257 701	543 565 643	874 228 150	1 873 439 105	558 526 165	898 290 503	1 923 620 510	573 486 887	922 351 856
<b>Taung Nyo</b>	16 611 77	18 988 74	14 390 80															
<b>(A) Gross Profit</b>	2 732 137 812	3 656 486 749	2 528 360 352															
<b>(B) Procurement Cost</b>																		
Input Cost	458 501 464	445 817 638	424 319 885															
Family Labor	299 975 343	315 801 735	258 940 685															
Hired Labor	545 430 856	956 956 541	786 673 971															
<b>(C) Net Profit</b>	1 428 230 149	937 910 835	1 060 425 811															
<b>Total(Kya/ha)</b>	1 428 230 149	937 910 835	1 060 425 811	1 471 077 053	966 048 160	1 092 238 585	1 513 923 958	984 185 485	1 124 051 380	1 556 770 962	1 022 322 810	1 186 984 134	1 599 617 787	1 050 490 135	1 187 676 906	1 642 464 671	1 018 587 460	1 219 489 683
<b>Incremental Achievement</b>					20%			40%		60%		80%		100%				
<b>Grand Total</b>	7 792 319 911	3 595 934 077	3 475 344 141	8 026 089 508	3 703 812 099	3 579 604 483	8 259 859 106	3 811 690 122	3 683 864 790	8 493 828 703	3 919 568 144	3 758 125 113	8 727 398 300	4 027 440 166	3 892 385 438	8 961 187 897	4 135 324 188	3 996 645 763

**Table 3.1.27 Crop: Monsoon Paddy (Economic Price) ( Estimation)**

Year	W/O P	W/ P	Increment
2017	14,863,598,129	15,309,506,072	445,907,943
2018	14,863,598,129	15,755,414,018	891,815,889
2019	14,863,598,129	16,201,321,960	1,337,723,831
2020	14,863,598,129	16,647,229,904	1,783,631,775
2021	14,863,598,129	17,093,137,848	2,229,539,719



**Table 3.1.28 Cost and Benefit of Crops (S-paddy) per Ace / Season**

Yield increase by		13%	
Area not changed			
Year	W/O P	W/ P	Increment
2017	3,128,399,552	3,209,737,940	81,338,388
2018	3,128,399,552	3,291,076,328	162,676,776
2019	3,128,399,552	3,372,414,715	244,015,163
2020	3,128,399,552	3,455,244,945	326,845,393
2021	3,128,399,552	3,547,260,314	418,860,762

**Table 3.1.29 Cost and Benefit of Crops (S-paddy) per Ace / Season ( Estimation)**

Crop	Summer- Paddy								
	Upper Position			Middle Position			Lower Position		
	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic
Gross Profit	202,986	0.78	158,329	164,560	0.78	128,357	226,086	0.78	176,347
Input Cost	33,789	0.77	26,018	39,205	0.77	30,188	39,484	0.77	30,403
Labor Cost									
Family Labor	31,573	0.6	18,944	30,193	0.6	18,116	39,465	0.6	23,679
Hired Labor	61,908	1.0	61,908	59,203	1.0	59,203	77,383	1.0	77,383
Net Profit	75,716		51,459	35,959		20,850	69,754		44,882
Total(Kyat/ac)	75,716		51,459	35,959		20,850	69,754	0.00	44,882

**Table 3.1.30 Crop: Summer-Paddy (Financial Price) ( Estimation)**

Activities	Without Project			2016			2017			2018			2019			2020		
	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position
<b>North Nawin</b>	6,804.39	2,592.95																
(A) Gross Profit	1,381,193,909	426,695,852																
(B) Proccution Cost																		
Input Cost	229,913,534	101,656,005																
Family Labor	214,835,005	78,288,939																
Hired Labor	421,246,176	153,510,419																
(C) Net Profit	515,201,194	93,239,889																
Total (Kyat/ac)	515,201,194	93,239,889		528,596,425	95,664,126		541,991,656	96,038,963		555,386,887	100,512,600		568,782,118	104,428,676		592,481,373	107,225,872	
<b>South Nawin</b>	5,718.37	23,949.20	0.00															
(A) Gross Profit	1,160,749,053	3,941,146,176	0															
(B) Proccution Cost																		
Input Cost	193,218,004	938,944,068	0															
Family Labor	180,546,096	723,110,273	0															
Hired Labor	354,012,850	1,417,888,169	0															
(C) Net Profit	432,972,103	861,203,908	0															
Total (Kyat/ac)	432,972,103	861,203,908	0	444,229,378	883,594,961	0	455,486,652	905,986,257	0	466,743,927	928,377,552	0	478,001,202	950,768,847	0	489,258,476	973,160,143	0
<b>Wegyi</b>	772.64	5,420.55	10,441.55															
(A) Gross Profit	156,831,103	892,005,708	2,360,668,273															
(B) Proccution Cost																		
Input Cost	26,106,733	212,512,963	412,274,190															
Family Labor	24,394,503	163,682,666	412,075,771															
Hired Labor	47,832,597	320,912,842	807,906,464															
(C) Net Profit	58,501,210	194,917,557	728,339,878															
Total (Kyat/ac)	58,501,210	194,917,557	728,339,878	60,022,241	199,985,413	747,276,715	61,543,273	205,053,270	766,213,552	63,064,304	210,121,126	785,150,388	64,585,336	215,188,983	804,087,225	66,106,367	220,256,839	823,024,062
<b>Taung Nyo</b>	1,324.97	2,589.96	724.96															
(A) Gross Profit	268,950,300	426,203,818	163,907,828															
(B) Proccution Cost																		
Input Cost	44,709,411	181,539,362	28,626,110															
Family Labor	41,833,278	78,198,962	28,611,396															
Hired Labor	82,026,243	153,333,402	56,101,127															
(C) Net Profit	100,321,428	93,132,372	50,570,255															
Total (Kyat/ac)	100,321,428	93,132,372	50,570,255	102,929,785	95,553,814	51,885,082	105,538,142	97,975,255	53,199,908	108,146,499	100,396,697	54,514,735	110,754,857	102,818,139	55,829,562	113,363,214	105,239,580	57,144,388
<b>Incremental Achievement</b>				20%			40%			60%		80%		100%				
<b>Grand Total</b>	1,106,995,935	1,242,493,484	778,910,133	1,135,777,829	1,274,798,314	799,161,797	1,164,559,723	1,307,103,145	819,413,460	1,193,341,617	1,339,267,675	839,665,123	1,222,123,513	1,373,204,845	859,946,787	1,261,299,430	1,405,862,434	880,168,450

**Table 3.1.31 Crop: Summer- Paddy (Economic Price) ( Estimation)**

Year	W/O P	W/ P	Increment
2017	1,942,642,063	1,993,150,756	50,508,693
2018	1,942,642,063	2,043,659,450	101,017,387
2019	1,942,642,063	2,094,168,142	151,526,079
2020	1,942,642,063	2,144,676,839	202,034,776
2021	1,942,642,063	2,195,185,533	252,543,470

**Table 3.1.32 Crop: Summer-Paddy (Economic Price) ( Estimation)**

Activities	Without Project			2017			2018			2019			2020			2021		
	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position
<b>North Nawin</b>	6,804.39	2,892.93																
<b>(A) Gross Profit</b>	1,077,332,264	332,823,283																
<b>(B) Production Cost</b>																		
Input Cost	177,036,619	78,275,971																
Family Labor	129,902,364	78,288,939																
Hired Labor	421,246,176	153,910,419																
<b>(C) Net Profit</b>	350,147,105	22,747,950																
<b>Total (Kyat/ac)</b>	350,147,105	22,747,950		359,250,930	23,339,397		368,354,754	23,030,843		377,458,570	24,522,290		386,562,404	25,113,737		395,666,229	25,705,184	
<b>South Nawin</b>	5,718.37	23,949.60	0.00															
<b>(A) Gross Profit</b>	905,383,804	3,074,098,907																
<b>(B) Production Cost</b>																		
Input Cost	148,780,551	722,990,525	0															
Family Labor	108,328,801	433,870,954	0															
Hired Labor	354,012,850	1,417,888,169	0															
<b>(C) Net Profit</b>	294,261,602	499,349,159	0															
<b>Total (Kyat/ac)</b>	294,261,602	499,349,159	0	301,912,404	512,332,237	0	309,563,205	525,315,315	0	317,214,407	538,236,383	0	324,864,809	551,281,872	0	332,515,610	564,264,550	0
<b>Wegyi</b>	772.64	5,420.55	10,441.55															
<b>(A) Gross Profit</b>	122,331,319	695,765,536	1,841,336,018															
<b>(B) Production Cost</b>																		
Input Cost	20,102,548	163,635,563	317,454,445															
Family Labor	14,638,892	98,198,684	247,245,462															
Hired Labor	47,832,597	320,912,822	807,996,464															
<b>(C) Net Profit</b>	39,759,282	113,018,467	468,637,647															
<b>Total (Kyat/ac)</b>	39,759,282	113,018,467	468,637,647	40,793,023	115,956,947	496,822,226	41,826,765	116,695,427	493,006,805	42,860,506	121,833,907	505,191,383	43,894,247	124,772,886	517,375,962	44,927,989	127,710,868	529,560,541
<b>Taung Nyo</b>	1,324.97	2,589.96	724.98															
<b>(A) Gross Profit</b>	209,781,174	332,439,496	127,848,048															
<b>(B) Production Cost</b>																		
Input Cost	34,473,069	78,185,712	22,041,567															
Family Labor	25,100,232	46,919,719	17,166,801															
Hired Labor	92,026,243	153,333,802	56,101,127															
<b>(C) Net Profit</b>	68,191,631	54,000,067	32,538,553															
<b>Total (Kyat/ac)</b>	68,191,631	54,000,067	32,538,553	69,954,353	55,404,684	33,384,555	71,727,076	56,808,702	34,230,556	73,499,798	58,212,719	35,076,540	75,272,521	59,616,736	35,922,563	77,045,243	61,020,754	36,768,565
<b>Incremental Achievement</b>				<b>20%</b>			<b>40%</b>			<b>60%</b>			<b>80%</b>			<b>100%</b>		
<b>Grand Total</b>	752,349,620	689,116,243	501,176,700	771,910,710	707,033,265	514,206,781	791,471,801	724,950,287	527,237,383	811,032,890	742,867,309	540,267,943	830,593,981	760,784,333	553,298,525	850,155,071	778,701,356	566,329,106

**Table 3.1.33 Cost and Benefit of Crops (Black-gram) per Ace / Season**

Upper	Yield increase by	44%
Middle	Yield increase by	0%
Lower	Yield increase by	150%

**Table 3.1.34 Cost and Benefit of Crops (Black-gram) per Ace / Season ( Estimation)**

Crop Location	Black Gram								
	Upper Position			Middle Position			Lower Position		
	Financial	Conversion	Economic	Financial	Conversion	Economic	Financial	Conversion	Economic
Gross Profit	250,167	1.07	267,679	328,000	1.07	350,960	153,494	1.07	164,239
Input Cost	38,684	0.77	29,787	37,086	0.77	28,556	15,476	0.77	11,917
Labor Cost									
Family Labor	20,825	0.6	12,495	22,481	0.6	13,489	21,197	0.6	12,718
Hired Labor	36,535	1.0	36,535	39,441	1.0	39,441	37,188	1.0	37,188
Net Profit	154,123		188,862	228,992		269,474	79,633		102,416
Total(Kyat/ac)	154,123		188,862	228,992		269,474	79,633	0.00	102,416

**Table 3.1.35 Cost and Benefit of Crops (Black-gram) per Ace / Season**

Area not changed			
Year	W/O P	W/ P	Increment
2017	11,060,848,967	11,771,412,456	710,563,489
2018	11,060,848,967	12,481,975,945	1,421,126,978
2019	11,060,848,967	13,192,539,435	2,131,690,468
2020	11,060,848,967	13,903,102,924	2,842,253,957
2021	11,060,848,967	14,613,666,415	3,552,817,448

**Table 3.1.36 Crop: Black-gram (Financial Price) ( Estimation)**

Activities	Without Project			2015			2017			2018			2019			2020		
	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position
<b>North Nawin</b>	3,587.23	5,342.19																
<b>(A) Gross Profit</b>	897,406,567	1,752,238,320																
<b>(B) Procurement Cost</b>																		
Input Cost	138,768,405	196,120,458																
Fam ly Labor	74,704,065	120,097,773																
Hired Labor	131,059,448	210,701,315																
<b>(C)Net Profit</b>	552,874,649	1,223,318,773																
<b>Total (Kyat/acre)</b>	552,874,649	1,223,318,773		601,527,618	1,223,318,773		650,180,587	1,223,318,773		698,833,556	1,223,318,773		747,486,525	1,223,318,773		796,139,495	1,223,318,773	
<b>South Nawin</b>	9,277.67	1,807.69	3,167.51															
<b>(A) Gross Profit</b>	2,320,956,871	592,922,320	496,113,780															
<b>(B) Procurement Cost</b>																		
Input Cost	358,897,385	67,039,161	49,020,385															
Fam ly Labor	193,207,478	40,638,679	17,141,709															
Hired Labor	338,959,673	71,297,101	117,793,362															
<b>(C)Net Profit</b>	1,429,902,334	413,946,549	252,238,324															
<b>Total (Kyat/acre)</b>	1,429,902,334	413,946,549	252,238,324	1,555,733,739	413,946,549	327,909,921	1,981,565,145	413,946,549	403,581,318	1,807,396,550	413,946,549	479,252,815	1,933,227,956	413,946,549	554,924,313	2,059,059,361	413,946,549	530,366,916
<b>Wegyi</b>	15,964.75	5,221.16	2,492.46															
<b>(A) Gross Profit</b>	3,463,853,613	1,712,540,480	382,577,655															
<b>(B) Procurement Cost</b>																		
Input Cost	611,580,398	193,631,940	38,573,311															
Fam ly Labor	333,495,919	117,379,898	52,832,675															
Hired Labor	583,372,141	205,827,772	92,989,602															
<b>(C)Net Profit</b>	2,460,535,164	1,195,103,670	198,482,067															
<b>Total (Kyat/acre)</b>	2,460,535,164	1,195,103,670	198,482,067	2,677,062,258	1,195,903,870	258,026,087	2,893,589,353	1,195,903,870	317,571,307	3,110,116,447	1,195,903,870	377,115,927	3,326,643,542	1,195,903,870	436,660,547	3,543,170,636	1,195,903,870	496,205,168
<b>Taung Nyo</b>	7,507.30	8,305.30	3,454.00															
<b>(A) Gross Profit</b>	1,878,078,719	2,724,138,400	530,168,276															
<b>(B) Procurement Cost</b>																		
Input Cost	290,412,393	308,010,356	53,454,104															
Fam ly Labor	154,339,813	196,711,449	73,314,438															
Hired Labor	274,279,206	337,599,337	128,447,552															
<b>(C)Net Profit</b>	1,157,047,597	1,901,847,258	275,052,382															
<b>Total (Kyat/acre)</b>	1,157,047,597	1,901,847,258	275,052,382	1,258,867,786	1,901,847,258	357,568,097	1,360,687,974	1,901,847,258	440,083,811	1,462,508,163	1,901,847,258	522,596,526	1,564,328,351	1,901,847,258	605,115,240	1,666,148,540	1,901,847,258	697,830,955
<b>Incremental Achievement</b>				20%				40%					60%					100%
<b>Grand Total</b>	5,600,359,744	4,734,716,451	725,772,773	6,093,191,401	4,734,716,450	943,504,105	6,586,023,059	4,734,716,450	1,151,236,436	7,379,354,716	4,734,716,450	1,378,909,269	7,571,685,374	4,734,716,450	1,598,700,190	9,664,618,032	4,734,716,450	1,814,431,933

**Table 3.1.37 Crop: Black-gram (Economic Price) ( Estimation)**

Year	W/O P	W/ P	Increment
2017	13,319,784,475	14,203,724,256	883,939,781
2018	13,319,784,475	15,087,664,038	1,767,879,563
2019	13,319,784,475	15,971,603,822	2,651,819,347
2020	13,319,784,475	16,855,543,604	3,535,759,129
2021	13,319,784,475	17,739,483,385	4,419,698,910

**Table 3.1.38 Crop: Black-gram (Economic Price) ( Estimation)**

Activities	Without Project			2017			2018			2019			2020			2021		
	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position	Upper Position	Middle Position	Lower Position
<b>North Nawin</b>	3 587 23	5 342 19																
<b>(A) Gross Profit</b>	960 226 139	1 874 895 002																
<b>(B) Procurement Cost</b>																		
Input Cost	1 05 852 620	152 551 970																
Family Labor	44 822 439	120 097 772																
Hired Labor	131 059 448	210 701 310																
<b>(C) Net Profit</b>	677 491 432	1 391 544 335																
<b>Total(Kyats)</b>	677 491 432	1 391 544 335		737 110 678	1 391 544 335		796 729 924	1 391 544 335		856 349 170	1 391 544 335		915 968 416	1 391 544 335		975 587 462	1 391 544 335	
<b>South Nawin</b>	9 277 67	1 807 89	3 167 51															
<b>(A) Gross Profit</b>	2 483 437 426	634 426 862	520 228 075															
<b>(B) Procurement Cost</b>																		
Input Cost	276 353 956	51 620 396	37 747 417															
Family Labor	115 924 487	24 383 930	40 384 392															
Hired Labor	338 666 673	71 297 101	117 793 362															
<b>(C) Net Profit</b>	1 752 199 312	487 125 455	324 403 704															
<b>Total(Kyats)</b>	1 752 199 312	487 125 455	324 403 704	1 906 392 851	487 125 455	421 724 615	2 060 596 391	487 125 455	519 045 926	2 214 779 930	487 125 455	6 16 367 038	2 388 973 470	487 125 455	713 088 149	2 523 167 006	487 125 455	811 009 260
<b>Wegyt</b>	15 964 75	5 221 11	2 492 46															
<b>(A) Gross Profit</b>	4 273 426 315	1 832 418 314	409 359 138															
<b>(B) Procurement Cost</b>																		
Input Cost	475 542 008	149 095 445	29 702 646															
Family Labor	199 479 551	70 428 227	31 699 106															
Hired Labor	583 272 141	205 927 772	92 899 502															
<b>(C) Net Profit</b>	3 015 134 615	1 406 966 879	256 267 784															
<b>Total(Kyats)</b>	3 015 134 615	1 406 966 879	256 267 784	3 280 466 411	1 406 966 879	331 848 119	3 545 798 307	1 406 966 879	408 428 454	3 811 130 153	1 406 966 879	485 008 790	4 076 461 960	1 406 966 879	561 989 125	4 341 793 846	1 406 966 879	638 169 450
<b>Taung Nyo</b>	7 517 30	8 305 30	3 454 00															
<b>(A) Gross Profit</b>	2 009 546 557	2 914 826 088	567 281 506															
<b>(B) Procurement Cost</b>																		
Input Cost	223 619 945	237 166 147	41 161 318															
Family Labor	63 803 714	112 030 192	43 927 972															
Hired Labor	274 279 206	327 569 337	128 447 362															
<b>(C) Net Profit</b>	1 417 843 692	2 238 062 412	353 744 894															
<b>Total(Kyats)</b>	1 417 843 692	2 238 062 412	353 744 894	1 542 113 937	2 238 062 412	459 868 323	1 167 384 182	2 238 062 412	365 991 762	1 792 154 427	2 238 062 412	672 115 242	1 916 504 672	2 238 062 412	718 238 701	2 041 094 915	2 238 062 412	884 362 160
<b>Incremental Achievement</b>				20%			40%			60%		80%		100%				
<b>Grand Total</b>	6 862 869 051	8 523 699 072	933 416 352	7 416 583 907	8 523 699 072	1 213 441 297	8 070 498 804	8 523 699 072	1 493 466 162	8 614 413 680	8 523 699 072	1 773 491 070	9 276 326 557	8 523 699 072	2 063 515 975	9 882 243 433	8 523 699 072	2 333 546 880

**Table 3.1.39 Project Cost Estimation (Financial / Economic) -Base 4 (Estimate of Road Benefit only)**

	2014年				2015年				2016年				2017年				2018年			
	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic
	FC	LC			FC	LC			FC	LC			FC	LC			FC	LC		
North Nawn	342,605		1.00	342,605	409,241	1.00	409,241	152,737		1.00	152,737									
LC	Total	210,722		183,300	251,204		307,900	140,482			122,200									
	Material	100,427	0.99	99,423	161,537	0.99	161,706	66,821	0.99	66,282										
	Skilled Labor	44,210	1.00	44,156	77,743	1.00	77,750	22,536	1.00	22,500										
	Unskilled Labor	66,045	0.60	39,627	110,924	0.60	66,044	44,029	0.60	26,418										
South Nawn	257,774		1.00	257,774	479,623	1.00	479,623	191,349		1.00	191,349									
LC	Total	179,249		141,379	484,968		402,230	233,627			160,892									
	Material	103,923	0.99	127,672	143,407	0.99	212,718	115,946	0.99	84,687										
	Skilled Labor	44,607	1.00	59,987	90,070	1.00	95,919	19,940	1.00	39,992										
	Unskilled Labor	89,333	0.60	53,720	148,322	0.60	89,523	56,680	0.60	35,813										
Wegyi								273,244		1.00	273,244	427,086		1.00	427,086	493,207		1.00	493,207	548,257
LC	Total							233,933			273,244	359,896			407,920	422,946			415,815	
	Material							121,450	0.99	121,283	202,612	0.99	209,686		117,010	0.99	115,815			
	Skilled Labor							64,340	1.00	64,340	107,234	1.00	107,234		125,811	1.00	125,811			
	Unskilled Labor							56,053	0.60	57,613	160,050	0.60	96,030		64,020	0.60	38,411			
Taung Nyo								294,736		1.00	294,736	484,596		1.00	484,596	197,324		1.00	197,324	
LC	Total							236,921			236,432	428,202			377,427	471,451			420,970	
	Material							112,450	0.99	134,026	225,674	0.99	221,111		20,241	0.99	89,251			
	Skilled Labor							42,652	1.00	48,262	61,270	1.00	61,070		12,918	1.00	32,246			
	Unskilled Labor							72,719	0.60	47,667	121,098	0.60	73,716		48,519	0.60	29,411			
Sub Total(FC+LC)	523,379	409,162		958,018	808,965	815,211	1,598,803	1,025,563	913,963	1,908,253	1,116,629	882,098	1,987,006	446,851	395,229				790,801	
Machinery Procurement	413,462		1.00	413,462	620,192															
Engineering Service																				
Engineering Service (DC)					199,407		1.00	199,407												
Engineering Service (SA)					51,922		0.99	51,412												
Engineering Service (SS)					79,847		1.00	79,847	79,847		1.00	79,847	79,847	1.00	79,847	79,847		1.00	79,847	
					76,532		0.99	76,228	76,532		0.99	76,228	76,532	0.99	76,228	76,532		0.99	76,228	
Total	946,841	499,200		1,381,114	1,171,472	1,226,609	2,170,104	1,105,410	929,901	2,008,236	1,196,476	1,008,421	2,167,181	526,498	425,172				894,976	
Physical Contingency	5%	47,342	24,975		69,086	89,270	41,280,490	84,243,200	58,270,800	46,970,000	100,236,300	59,811,800	50,431,450	194,290,950	26,224,900	20,788,600			44,748,500	
Project Management (FC+LC)	10%	53,328	49,916		93,801	103,896	11,527,700	19,669,800	10,356,200	91,896,800	180,825,100	111,662,900	98,309,800	196,700,900	14,662,150	39,422,900			79,480,100	
Sub Total		1,047,511	573,291		1,546,601	1,365,910	1,448,406,650	1,925,118,700	1,083,237	1,078,372	2,099,737,000	1,247,962,700	1,107,732,250	2,390,240,650	57,488,000	106,164,500			1,019,204,900	
Grand Total(FC+LC)						1,494,096		1,241,861			1,278,819,050				1,073,172,000					
O&M	0.3%				1,841	1,499	1,145,142	8,207,759	3,974,321	9,266,434	11,818,328	6,932,020	15,797,032	45,108,417	9,819,723				21,253,415	

Table 3.1.40 Project Cost and Benefit Estimation -Base 4 (Estimate of Road Benefit only)

Particulars	FC/LC	Total	Ratio, %	2014	2015	2016	2017	2018	2019	2020	Remarks
<b>Implementation</b>											
<b>1 Civil &amp; Structure Construction</b>											
1.1 North Nawin	FC	818,684,000	54	245,605,000	409,342,000	163,737,000					
	LC	702,408,000	46	210,722,000	351,204,000	140,482,000					
	(unskilled labors)	220,149,000	31	66,045,000	110,074,000	44,030,000					
	Sub Total (FC+LC)	1,521,092,000	100	456,327,000	760,546,000	304,219,000	0				
1.2 South Nawin	FC	959,246,000	51	287,774,000	479,623,000	191,849,000					
	LC	928,136,000	49	278,441,000	464,068,000	185,627,000					
	(unskilled labors)	298,444,000	32	89,533,000	149,222,000	59,689,000					
	Sub Total (FC+LC)	3,019,812,000	100	566,215,000	943,691,000	1,509,906,000	0				
1.3 Wegyi	FC	1,244,137,000	53			373,241,000	622,069,000	248,827,000			
	LC	1,119,792,000	47			335,938,000	559,896,000	223,958,000			
	(unskilled labors)	320,100,000	29			96,030,000	160,050,000	64,020,000			
	Sub Total (FC+LC)	3,782,288,000	100			709,179,000	1,181,965,000	1,891,144,000			
1.4 Taung Nyo	FC	989,120,000	54			296,736,000	494,560,000	197,824,000			
	LC	856,404,000	46			256,921,000	428,202,000	171,281,000			
	(unskilled labors)	242,596,000	28			72,779,000	121,298,000	48,519,000			
	Sub Total (FC+LC)	1,845,524,000	100			553,657,000	922,762,000	369,105,000			
<b>Total of Civil &amp; Structure Construction</b>	FC	4,011,187,000	53	533,379,000	888,965,000	1,025,563,000	1,116,629,000	446,651,000			
	LC	3,606,740,000	47	489,163,000	815,272,000	918,968,000	988,098,000	395,239,000			
	(unskilled labors)	1,081,289,000	30	155,578,000	259,296,000	272,528,000	281,348,000	112,539,000			
	<b>Total (FC+LC)</b>	<b>7,617,927,000</b>	<b>100</b>	<b>1,022,542,000</b>	<b>1,704,237,000</b>	<b>1,944,531,000</b>	<b>2,104,727,000</b>	<b>841,890,000</b>			<b>Total Machineries cost</b>
<b>2 Machineries Procurement</b>	FC	15,819,165,004	100	413,462,002	820,193,002					5,914,204,000	8,871,306,000
	LC	10,336,550	0		10,336,550						147,855,100
	<b>Total (FC+LC)</b>	<b>15,977,356,654</b>	<b>100</b>	<b>413,462,002</b>	<b>630,529,552</b>	<b>0</b>	<b>0</b>			<b>5,914,204,000</b>	<b>9,019,161,100</b>
<b>5 Engineering Service</b>		0									
5.1 Engineering Service (DD)	FC	198,407,376	80		198,407,376						
	LC	51,021,996	20		51,021,996						
	<b>Total (FC+LC)</b>	<b>249,429,372</b>	<b>100</b>		<b>249,429,372</b>		<b>0</b>				
5.2 Engineering Service (SV)	FC	319,388,028	80		79,847,007	79,847,007	79,847,007	79,847,007			
	LC	82,133,064	20		20,533,266	20,533,266	20,533,266	20,533,266			
	<b>Total (FC+LC)</b>	<b>401,521,096</b>	<b>100</b>		<b>100,380,274</b>	<b>100,380,274</b>	<b>100,380,274</b>	<b>100,380,274</b>			
1.1 Total of 1, 2, 5 (FC)	FC	5,562,637,408	60	946,841,002	1,787,412,385	1,105,410,007	1,196,476,007	526,498,007			
1.2 Total of 1, 2, 5 (LC)	LC	3,729,698,344	40	499,499,550	886,827,262	939,501,266	1,008,631,266	395,239,000			
1.3 Total of 1, 2, 5 (Unskilled Labors)	(unskilled labors)	1,081,289,000	29	155,578,000	259,296,000	272,528,000	281,348,000	112,539,000			
1.4 Total of 1, 2, 5 (Grand Total)	<b>Total (FC+LC)</b>	<b>9,292,335,752</b>	<b>100</b>	<b>1,446,340,552</b>	<b>2,674,239,647</b>	<b>2,044,911,273</b>	<b>2,205,107,273</b>	<b>921,737,007</b>			
2.1 Physical Contingency (5% of 1.1)	5% FC	278,131,869	60	47,342,050	89,370,619	55,270,500	59,823,800	26,324,900			
2.2 Physical Contingency (5% of 1.2)	5% LC	186,484,917	40	24,974,978	44,341,363	46,975,063	50,431,563	19,761,950			
2.3 Physical Contingency (5% of 1.3)	5% (unskilled labors)	54,064,450	29	7,778,900	12,964,800	13,626,400	14,067,400	5,626,950			
2.4 Physical Contingency (5% of 1.4)	5% <b>Total (FC+LC)</b>	<b>464,616,788</b>	<b>100</b>	<b>72,317,028</b>	<b>133,711,982</b>	<b>102,245,564</b>	<b>110,255,364</b>	<b>46,086,850</b>			
3.1 Total of 1.1 & 2.1	FC	5,840,769,277	60	994,183,052	1,876,783,004	1,160,680,507	1,256,299,807	552,822,907			
3.2 Total of 1.1 & 2.2	LC	3,916,183,261	40	524,474,528	931,168,625	986,476,329	1,059,062,829	415,000,950			
3.3 Total of 1.1 & 2.3	(unskilled labors)	1,135,353,450	29	163,356,900	272,260,800	286,154,400	295,415,400	118,165,950			
3.4 Total of 1.1 & 2.4	<b>Total (FC+LC)</b>	<b>9,756,952,540</b>	<b>100</b>	<b>1,518,657,580</b>	<b>2,807,951,629</b>	<b>2,147,156,837</b>	<b>2,315,362,637</b>	<b>967,823,857</b>			
4 Project Management (10% of 1)	10% LC	761,792,700	100	102,254,200	170,423,700	194,453,100	210,472,700	84,189,000			
5 Others (Miscellaneous, 5% of 1-2)	5% LC	402,086,278	100	71,800,200	85,728,678	97,226,550	105,236,350	42,094,500			
6.1 Grand Total Cost for Project Evaluation	FC	5,840,769,277	53	994,183,052	1,876,783,004	1,160,680,507	1,256,299,807	552,822,907			
6.2 Grand Total Cost for Project Evaluation	LC	5,080,062,239	47	698,528,928	1,187,321,003	1,278,155,979	1,374,771,879	541,284,450			
6.3 Grand Total Cost for Project Evaluation	<b>Total (FC+LC)</b>	<b>10,920,831,516</b>	<b>100</b>	<b>1,692,711,980</b>	<b>3,064,104,007</b>	<b>2,438,836,486</b>	<b>2,631,071,686</b>	<b>1,094,107,357</b>			
<b>7 Operation and Maintenance</b>	0.30% LC				4,308,012	11,312,312	17,145,905	19,152,074			25,985,756



<b>1 Road Improvement</b>										
<b>1.1 North Nawin</b>										
<b>1.1.1 Monsoon Paddy for threshing</b>										
(a) Area Improved (ac)										
(b) Cost before Rehabilitation (kt)				0	0	0	0	0	0	0
(c) Cost after Rehabilitation (Kt)				0	0	0	0	0	0	0
(d) Net Profit (Kt)				0	0	0	0	0	0	0
<b>1.1.2 Summer Paddy for threshing</b>										
(a) Area Improved (ac)				2,998.44	1,110.53	1,110.53	1,110.53	1,110.53	1,110.53	1,110.53
(b) Cost before Rehabilitation (kt)				179,906,400	66,631,800	66,631,800	66,631,800	66,631,800	66,631,800	66,631,800
(c) Cost after Rehabilitation (Kt)				63,515,955	23,524,357	23,524,357	23,524,357	23,524,357	23,524,357	23,524,357
(d) Net Profit (Kt)				116,390,445	159,497,888	159,497,888	159,497,888	159,497,888	159,497,888	159,497,888
<b>1.1.3 Improvement of Trollegyi Driving Condition</b>										
(a) Monsoon Paddy Cultivation (kyat)				9,551,109	3,537,447	0				
(b) Summer Paddy Cultivation (kyat)				1,688,122	625,228	0				
(c) Black Gram Cultivation (kyat)				12,939,351	4,792,358	0				
(d) Accumulation above (kyat)				24,178,582	33,133,615	33,133,615	33,133,615	33,133,615	33,133,615	33,133,615
<b>1.2 South Nawin</b>										
<b>1.2.1 Monsoon Paddy</b>										
(a) Area Improved (ac)										
(b) Cost before Rehabilitation (kt)				0	0	0	0	0	0	0
(c) Cost after Rehabilitation (Kt)				0	0	0	0	0	0	0
(d) Net Profit (Kt)				0	0	0	0	0	0	0
<b>1.2.2 Summer Paddy</b>										
(a) Area Improved (ac)				2,245.49	1,464.45	1,464.45	1,464.45	1,464.45	1,464.45	1,464.45
(b) Cost before Rehabilitation (kt)				134,729,400	87,867,000	87,867,000	87,867,000	87,867,000	87,867,000	87,867,000
(c) Cost after Rehabilitation (Kt)				47,566,215	31,021,444	31,021,444	31,021,444	31,021,444	31,021,444	31,021,444
(d) Net Profit (Kt)				87,163,185	144,008,741	144,008,741	144,008,741	144,008,741	144,008,741	144,008,741
<b>1.2.3 Improvement of Trollegyi Driving Condition</b>										
(a) Monsoon Paddy Cultivation (kyat)				13,488,602	8,796,914	0				
(b) Summer Paddy Cultivation (kyat)				1,264,211	824,485	0				
(c) Black Gram Cultivation (kyat)				28,326,064	18,473,520	0				
(d) Accumulation above (kyat)				43,078,877	71,173,796	71,173,796	71,173,796	71,173,796	71,173,796	71,173,796
<b>1.3 Wegyi</b>										
<b>1.3.1 Monsoon Paddy</b>										
(a) Area Improved (ac)						13,413.39	5,412.42	0.00	0.00	0.00
(b) Cost before Rehabilitation (kt)						934,966,937	377,267,324	0	0	0
(c) Cost after Rehabilitation (Kt)						284,135,840	114,651,293	0	0	0
(d) Net Profit (Kt)						650,831,097	913,447,128	913,447,128	913,447,128	913,447,128
<b>1.3.2 Summer Paddy</b>										
(a) Area Improved (ac)						772.64	5,420.55	1,602.91	0.00	0.00
(b) Cost before Rehabilitation (kt)						46,358,400	325,233,000	96,174,600	0	0
(c) Cost after Rehabilitation (Kt)						16,366,833	114,823,511	33,954,443	0	0
(d) Net Profit (Kt)						29,991,567	240,401,056	302,621,213	302,621,213	302,621,213
<b>1.3.3 Improvement of Trollegyi Driving Condition</b>										
(a) Monsoon Paddy Cultivation (kyat)						7,551,739	3,047,192	30,618,220		
(b) Summer Paddy Cultivation (kyat)						434,996	3,051,770	5,878,593		
(c) Black Gram Cultivation (kyat)						10,348,045	4,175,529	3,458,976		
(d) Accumulation above (kyat)						18,334,780	28,609,271	68,565,060	68,565,060	68,565,060
<b>1.4 Taung Nyo</b>										
<b>1.4.1 Monsoon Paddy</b>										
(a) Area Improved (ac)						16,499.76	10,233.56	0.00	0.00	0.00
(b) Cost before Rehabilitation (kt)						1,150,099,271	713,320,066	0	0	0
(c) Cost after Rehabilitation (Kt)						349,514,416	216,777,501	0	0	0
(d) Net Profit (Kt)						800,584,855	1,297,127,420	1,297,127,420	1,297,127,420	1,297,127,420
<b>1.4.2 Summer Paddy</b>										
(a) Area Improved (ac)						1,324.97	1,156.76	0.00	0.00	0.00
(b) Cost before Rehabilitation (kt)						79,498,200	69,405,600	0	0	0
(c) Cost after Rehabilitation (Kt)						28,066,840	24,503,647	0	0	0
(d) Net Profit (Kt)						51,431,360	96,333,313	96,333,313	96,333,313	96,333,313
<b>1.1.3 Improvement of Trollegyi Driving Condition</b>										
(a) Monsoon Paddy Cultivation (kyat)						9,289,365	5,761,494	0		
(b) Summer Paddy Cultivation (kyat)						745,958	651,256	0		
(c) Black Gram Cultivation (kyat)						19,507,666	12,099,138	0		
(d) Accumulation above (kyat)						29,542,989	48,054,877	48,054,877	48,054,877	48,054,877
<b>Sub-total of Road Improve Benefit (kt)</b>						270,811,089	407,814,040	1,988,530,688	3,031,787,105	3,133,963,051
<b>Total (Base Case, Financial)</b>						270,811,089	407,814,040	1,988,530,688	3,031,787,105	3,133,963,051



Table 3.1.42 Financial Cost and Benefit Analyses Base 4 (Estimate of Road Benefit only)

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	FIRR = Present Value Factor	32.9%		B/C = Present Value Factor	2.45	
							Present Value			Present Value	
							Discount Rate	32.9%		Discount Rate	12.0%
Investment	O & M	Total	Total			Cost	Benefit		Cost	Benefit	
1	1,620,912,000		1,620,912,000	0	-1,620,912,000	0.75245	1,219,655,234	0	0.89286	1,447,247,488	0
2	2,914,096,000	4,340,000	2,918,436,000	270,811,089	-2,647,624,911	0.56617	1,652,330,910	153,325,114	0.79719	2,326,547,995	215,887,892
3	2,341,610,000	12,178,086	2,353,788,086	1,969,023,022	-384,765,064	0.42602	1,002,760,800	838,843,188	0.71178	1,675,379,284	1,401,511,207
4	2,525,835,050	18,312,819	2,544,147,869	3,000,180,301	456,032,432	0.32055	815,526,599	961,707,795	0.63552	1,616,856,854	1,906,674,585
5	1,073,572,500	24,928,140	1,098,500,640	3,102,356,247	2,003,855,607	0.24120	264,958,354	748,288,327	0.56743	623,322,218	1,760,370,005
6		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.18149	4,524,208	563,046,635	0.50663	12,629,344	1,571,746,745
7		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.13656	3,404,187	423,657,769	0.45235	11,276,244	1,403,350,848
8		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.10275	2,561,366	318,767,104	0.40388	10,067,977	1,252,979,641
9		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.07732	1,927,444	239,874,185	0.36061	8,989,337	1,118,740,686
10		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.05818	1,450,319	180,495,086	0.32197	8,026,113	998,865,641
11		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.04377	1,091,105	135,790,133	0.28748	7,166,342	891,865,374
12		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.03294	821,133	102,191,615	0.25668	6,398,555	796,312,801
13		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.02478	617,719	76,876,388	0.22917	5,712,782	710,966,981
14		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.01865	464,910	57,858,944	0.20462	5,100,796	634,804,135
15		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.01403	349,742	43,526,058	0.18270	4,554,371	566,800,486
16		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.01056	263,241	32,760,882	0.16312	4,066,278	506,056,351
17		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00794	197,929	24,632,709	0.14564	3,630,534	451,827,164
18		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00598	149,070	18,552,090	0.13004	3,241,655	403,430,406
19		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00450	112,177	13,960,603	0.11611	2,894,406	360,214,584
20		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00338	84,257	10,485,964	0.10367	2,584,300	321,621,272
21		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00255	63,567	7,911,008	0.09256	2,307,349	287,154,094
22		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00192	47,862	5,956,524	0.08264	2,060,061	256,378,720
23		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00144	35,897	4,467,393	0.07379	1,839,447	228,922,867
24		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00108	26,922	3,350,545	0.06588	1,642,266	204,383,230
25		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00082	20,441	2,543,932	0.05882	1,466,273	182,480,594
26		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00061	15,206	1,892,437	0.05252	1,309,226	162,935,750
27		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00046	11,467	1,427,084	0.04689	1,168,880	145,469,484
28		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00035	8,725	1,085,825	0.04187	1,043,741	129,895,656
29		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00026	6,481	806,613	0.03738	931,814	115,966,077
30		24,928,140	24,928,140	3,102,356,247	3,077,428,107	0.00020	4,986	620,471	0.03338	832,101	103,556,652
Total	10,476,025,550	682,962,545	11,158,988,095		74,742,288,739		4,973,492,258	4,974,702,421		7,800,294,031	19,091,169,928
							NPV =	1,210,163		NPV =	11,290,875,897

**Table 3.1.43 Economic Cost and Benefit Analyses (Estimate of Road Benefit only)**

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	EIRR = Present Value Factor	32.6%		B/C = Present Value Factor	2.42	
							Present Value			Present Value	
	Investment	O & M	Total	Total			Discount Rate	32.6%		Discount Rate	12.0%
							Cost	Benefit		Cost	Benefit
1	1,620,912,000		1,620,912,000	0	-1,620,912,000	0.75415	1,222,410,785	0	0.89286	1,447,247,488	0
2	2,914,096,000	4,340,000	2,918,436,000	268,237,864	-2,650,198,136	0.56874	1,659,831,291	152,557,603	0.79719	2,326,547,995	213,836,543
3	2,341,610,000	12,178,086	2,353,788,086	1,949,467,677	-404,320,409	0.42891	1,009,563,248	836,146,181	0.71178	1,675,379,284	1,387,592,103
4	2,525,835,050	18,312,819	2,544,147,869	2,970,313,382	426,165,513	0.32346	822,930,070	960,777,567	0.63552	1,616,856,854	1,887,693,561
5	1,073,572,500	24,928,140	1,098,500,640	3,071,467,568	1,972,966,928	0.24394	267,968,246	749,253,799	0.56743	623,322,218	1,742,842,842
6		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.18397	4,586,030	565,057,888	0.50663	12,629,344	1,556,097,614
7		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.13874	3,458,530	426,135,410	0.45235	11,276,244	1,389,378,354
8		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.10463	2,608,231	321,367,652	0.40388	10,067,977	1,240,504,321
9		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.07891	1,967,080	242,369,506	0.36061	8,989,337	1,107,601,920
10		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.05951	1,483,474	182,783,035	0.32197	8,026,113	988,920,413
11		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.04488	1,118,775	137,847,464	0.28748	7,166,342	882,985,496
12		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.03384	843,568	103,938,463	0.25668	6,398,555	788,384,295
13		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.02552	636,166	78,383,852	0.22917	5,712,782	703,888,223
14		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.01925	479,867	59,125,751	0.20462	5,100,796	628,483,694
15		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.01452	361,957	44,597,709	0.18270	4,554,371	561,157,125
16		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.01095	272,963	33,632,570	0.16312	4,066,278	501,017,790
17		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00826	205,906	25,370,322	0.14564	3,630,534	447,328,537
18		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00623	155,302	19,135,243	0.13004	3,241,655	399,413,643
19		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00470	117,162	14,435,898	0.11611	2,894,406	356,628,099
20		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00354	88,246	10,872,995	0.10367	2,584,300	318,419,043
21		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00267	66,558	8,200,818	0.09256	2,307,349	284,295,038
22		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00201	50,106	6,173,650	0.08264	2,060,061	253,826,080
23		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00152	37,891	4,668,631	0.07379	1,839,447	226,643,592
24		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00115	28,667	3,532,188	0.06588	1,642,266	202,348,283
25		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00086	21,438	2,641,462	0.05882	1,466,273	180,663,722
26		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00065	16,203	1,996,454	0.05252	1,309,226	161,313,477
27		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00049	12,215	1,505,019	0.04689	1,168,880	144,021,114
28		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00037	9,223	1,136,443	0.04187	1,043,741	128,602,347
29		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00028	6,980	860,011	0.03738	931,814	114,811,458
30		24,928,140	24,928,140	3,071,467,568	3,046,539,428	0.00021	5,235	645,008	0.03338	832,101	102,525,587
Total	10,476,025,550	682,962,545	11,158,988,095	84,777,937,827	73,887,187,596	3	5,001,341,413	4,995,148,592		7,800,294,031	18,901,224,314
							NPV =	-6,192,821		NPV =	11,100,930,283

Table 3.1.44 Cases for Sensitive Analysis (SA1)

Case	Cost	Benefit	Base Cost and Benefit	Remarks
SA 1 (C+10%)	+10%	No change	Base 1	

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	EIRR = Present Value Factor	19.9%		B/C = Present Value Factor	1.51				
	Investment	O & M	Total				Total	Discount Rate		Present Value		Discount Rate	Present Value	
										Cost	Benefit		Cost	Benefit
1	24,116,403,300		24,116,403,300	0	-24,116,403,300	0.83403	20,113,803,844	0	0.89286	21,532,571,850	0			
2	26,243,932,000	63,150,000	26,307,082,000	6,684,353,535	-19,622,728,465	0.69560	18,299,206,239	4,649,636,319	0.79719	20,971,742,700	5,328,699,795			
3	45,684,259,500	141,068,061	45,825,327,561	17,053,505,075	-28,771,822,486	0.58015	26,585,563,785	9,893,590,969	0.71178	32,617,551,651	12,138,343,842			
4	32,560,511,500	256,819,872	32,817,331,372	24,053,704,606	-8,763,626,766	0.48386	15,878,993,958	11,638,625,511	0.63552	20,856,070,434	15,286,610,351			
5	25,035,497,300	337,314,933	25,372,812,233	27,165,281,249	1,792,469,016	0.40356	10,239,452,105	10,962,820,901	0.56743	14,397,294,845	15,414,395,539			
6		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.33658	113,533,460	9,143,290,363	0.50663	170,893,865	13,762,746,439			
7		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.28072	94,691,048	7,625,837,752	0.45235	152,584,410	12,288,214,973			
8		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.23412	78,972,172	6,359,935,646	0.40388	136,234,755	10,971,513,791			
9		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.19527	65,867,487	5,304,564,469	0.36061	121,639,138	9,796,072,071			
10		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.16286	54,935,110	4,424,137,704	0.32197	108,605,289	8,746,405,604			
11		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.13583	45,817,487	3,689,860,152	0.28748	96,971,297	7,809,475,053			
12		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.11328	38,211,036	3,077,283,060	0.25668	86,581,997	6,972,784,391			
13		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.09448	31,869,515	2,566,575,772	0.22917	77,302,463	6,225,467,504			
14		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.07880	26,580,417	2,140,624,162	0.20462	69,021,382	5,558,559,849			
15		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.06572	22,168,337	1,785,302,284	0.18270	61,627,438	4,963,096,884			
16		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.05481	18,488,231	1,488,929,065	0.16312	55,022,812	4,431,200,677			
17		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.04572	15,422,039	1,241,996,659	0.14564	49,126,547	3,956,351,561			
18		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.03813	12,861,818	1,035,812,174	0.13004	43,864,434	3,532,573,174			
19		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.03180	10,726,615	863,855,944	0.11611	39,165,637	3,154,160,806			
20		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.02652	8,945,592	720,423,259	0.10367	34,969,439	2,816,224,707			
21		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.02212	7,461,406	600,896,021	0.09256	31,221,870	2,514,418,432			
22		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.01845	6,223,461	501,199,439	0.08264	27,875,706	2,244,938,842			
23		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.01539	5,191,277	418,073,678	0.07379	24,890,469	2,004,526,103			
24		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.01283	4,327,751	348,530,558	0.06588	22,222,308	1,789,648,729			
25		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.01070	3,609,270	290,668,509	0.05882	19,840,864	1,597,861,843			
26		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00893	3,012,222	242,585,962	0.05252	17,715,780	1,426,720,571			
27		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00745	2,512,996	202,381,345	0.04689	15,816,697	1,273,780,038			
28		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00621	2,094,726	168,696,397	0.04187	14,123,376	1,137,410,326			
29		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00518	1,747,291	140,716,157	0.03738	12,608,832	1,015,438,213			
30		337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00432	1,457,201	117,354,015	0.03338	11,259,572	906,777,088			
Total	153,640,603,600	9,231,226,191	162,871,829,791	747,404,522,155	591,217,045,899	5	91,793,747,896	91,644,204,246		111,876,417,857	169,064,417,196			
							NPV =	-149,543,650		NPV =	57,187,999,339			

**Table 3.1.45 Cases for Sensitive Analysis (SA2)**

Case	Cost	Benefit	Base Cost and Benefit	Remarks
SA 2 (B-10%)	No Change	-10%	Base 1	

Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	EIRR = Present Value Factor	19.6% Present Value		B/C = 1.49 Present Value		
Investment	O & M	Total	Total			Discout Rate	19.6%	Factor	Discout Rate	12.0%
						Cost	Benefit		Cost	Benefit
21,924,003,000		21,924,003,000	0	-21,924,003,000	0.83612	18,331,097,388	0	0.89286	19,575,065,319	0
23,858,120,000	63,150,000	23,921,270,000	6,015,918,182	-17,905,351,818	0.69910	16,723,359,857	4,205,728,401	0.79719	19,069,797,231	4,795,829,816
41,531,145,000	141,068,061	41,672,213,061	15,348,154,568	-26,324,058,493	0.58453	24,358,658,701	8,971,456,790	0.71178	29,661,447,813	10,924,509,458
29,600,465,000	256,819,872	29,857,284,872	21,648,334,145	-8,208,950,727	0.48874	14,592,449,408	10,580,406,830	0.63552	18,974,901,682	13,757,949,316
22,759,543,000	337,314,933	23,096,857,933	24,448,753,124	1,351,895,191	0.40864	9,438,300,026	9,990,738,477	0.56743	13,105,850,097	13,872,955,985
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.34167	115,250,393	8,353,405,480	0.50663	170,893,865	12,386,471,795
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.28568	96,364,130	6,984,519,792	0.45235	152,584,410	11,059,393,476
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.23886	80,571,045	5,839,829,171	0.40388	136,234,755	9,874,362,412
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.19972	67,368,538	4,882,904,974	0.36061	121,639,138	8,816,464,864
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.16699	56,328,221	4,082,697,284	0.32197	108,605,289	7,871,765,043
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.13962	47,095,911	3,413,534,911	0.28748	96,971,297	7,028,527,548
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.11674	39,378,145	2,854,147,440	0.25668	86,581,997	6,275,505,952
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.09761	32,925,311	2,386,442,792	0.22917	77,302,463	5,602,920,753
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.08161	27,528,272	1,995,262,742	0.20462	69,021,382	5,002,703,864
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.06824	23,018,371	1,668,382,913	0.18270	61,627,438	4,466,787,196
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.05706	19,247,190	1,395,045,853	0.16312	55,022,812	3,988,080,610
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.04771	16,093,295	1,166,450,012	0.14564	49,126,547	3,560,716,405
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.03989	13,455,493	975,260,762	0.13004	43,864,434	3,179,315,856
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.03335	11,249,453	815,365,917	0.11611	39,165,637	2,838,744,725
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.02789	9,407,713	681,875,725	0.10367	34,969,439	2,534,602,236
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.02332	7,866,184	570,144,923	0.09256	31,221,870	2,262,976,589
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.01949	6,574,268	476,506,198	0.08264	27,875,706	2,020,444,958
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.01630	5,498,233	398,514,676	0.07379	24,890,469	1,804,073,493
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.01363	4,597,603	333,236,505	0.06588	22,222,308	1,610,683,856
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.01140	3,845,390	278,715,786	0.05882	19,840,864	1,438,075,659
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.00953	3,214,611	232,996,617	0.05252	17,715,780	1,284,048,514
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.00797	2,688,400	194,856,562	0.04689	15,816,697	1,146,402,034
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.00666	2,246,517	162,828,696	0.04187	14,123,376	1,023,669,293
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.00557	1,878,844	136,179,555	0.03738	12,608,832	913,894,392
	337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.00466	1,571,888	113,931,190	0.03338	11,259,572	816,099,379
139,673,276,000	9,231,226,191	148,904,502,191	672,664,069,937	529,775,485,928	5	84,139,128,799	84,141,366,974		101,888,248,519	152,157,975,477
						NPV =	2,238,175			NPV = 50,269,726,958

Table 3.1.46 Cases for Sensitive Analysis (SA3)

Case	Cost	Benefit	Base Cost and Benefit	Remarks
SA 3 (C+10B-10)	+10%	-10%	Base 1	

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	EIRR = 17.5%		B/C = 1.36			
						Present Value Factor	Present Value		Present Value Factor	Present Value	
	Investment	O & M	Total	Total	Discount Rate		17.5%	Discount Rate		12.0%	
						Cost			Benefit		Cost
1	24,116,403,300		24,116,403,300	0	-24,116,403,300	0.85106	20,524,506,192	0	0.89286	21,532,571,850	0
2	26,243,932,000	63,150,000	26,307,082,000	6,015,918,182	-20,291,163,818	0.72431	19,054,482,563	4,357,389,698	0.79719	20,971,742,700	4,795,829,816
3	45,684,259,500	141,068,061	45,825,327,561	15,348,154,568	-30,477,172,993	0.61643	28,248,106,668	9,461,062,920	0.71178	32,617,551,651	10,924,509,458
4	32,560,511,500	256,819,872	32,817,331,372	21,648,334,145	-11,168,997,227	0.52462	17,216,628,384	11,357,149,059	0.63552	20,856,070,434	13,757,949,316
5	25,035,497,300	337,314,933	25,372,812,233	24,448,753,124	-924,059,109	0.44649	11,328,706,934	10,916,123,782	0.56743	14,397,294,845	13,872,955,985
6		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.37999	128,176,301	9,290,281,700	0.50663	170,893,865	12,386,471,795
7		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.32340	109,087,649	7,906,726,760	0.45235	152,584,410	11,059,393,476
8		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.27523	92,839,189	6,729,030,322	0.40388	136,234,755	9,874,362,412
9		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.23424	79,012,650	5,726,875,932	0.36061	121,639,138	8,816,464,864
10		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.19935	67,243,732	4,873,858,935	0.32197	108,605,289	7,871,765,043
11		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.16966	57,228,852	4,147,975,455	0.28748	96,971,297	7,028,527,548
12		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.14439	48,704,903	3,530,155,464	0.25668	86,581,997	6,275,505,952
13		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.12289	41,452,632	3,004,507,271	0.22917	77,302,463	5,602,920,753
14		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.10459	35,279,769	2,557,095,089	0.20462	69,021,382	5,002,703,864
15		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.08901	30,024,402	2,176,183,516	0.18270	61,627,438	4,466,787,196
16		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.07575	25,551,606	1,851,993,049	0.16312	55,022,812	3,988,080,610
17		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.06447	21,746,694	1,576,211,114	0.14564	49,126,547	3,560,716,405
18		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.05487	18,508,470	1,341,503,084	0.13004	43,864,434	3,179,315,856
19		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.04670	15,752,607	1,141,756,771	0.11611	39,165,637	2,838,744,725
20		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.03974	13,404,895	971,593,449	0.10367	34,969,439	2,534,602,236
21		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.03382	11,407,991	826,856,831	0.09256	31,221,870	2,262,976,589
22		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.02879	9,711,297	703,879,602	0.08264	27,875,706	2,020,444,958
23		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.02450	8,264,216	598,994,452	0.07379	24,890,469	1,804,073,493
24		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.02085	7,033,016	509,756,503	0.06588	22,222,308	1,610,683,856
25		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.01774	5,983,967	433,720,880	0.05882	19,840,864	1,438,075,659
26		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.01510	5,093,455	369,176,172	0.05252	17,715,780	1,284,048,514
27		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.01285	4,334,497	314,166,478	0.04689	15,816,697	1,146,402,034
28		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.01094	3,690,225	267,469,359	0.04187	14,123,376	1,023,669,293
29		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.00931	3,140,402	227,617,892	0.03738	12,608,832	913,894,392
30		337,314,933	337,314,933	24,448,753,124	24,111,438,191	0.00792	2,671,534	193,634,125	0.03338	11,259,572	816,099,379
Total	153,640,603,600	9,231,226,191	162,871,829,791	672,664,069,937	515,808,158,328	6	97,217,775,692	97,362,745,664		111,876,417,857	152,157,975,477
							NPV =	144,969,972		NPV =	40,281,557,620









**Table 3.1.49 Cases for Sensitive Analysis (SA4) / Project Cost and Benefit Estimation**

Benefit	2015			2016			2017			2018			2019			2020		
	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic	Financial	Conversion Factor	Economic
1 Agriculture Production																		
1.1 North Nawin																		
1.1.1 Black Gram																		
(a) Increase of Sawn Area (ac)	5,074.12		5,074	5,074.12		5,074.12	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0
(b) Gross Profit (Ktac)	328,000	1.07	350,960	328,000	1.07	350,960												
(c) Input Cost (ktac)	37,086	0.77	28,556	37,086	0.77	28,556												
(d) Family Labor (ktac)	28,258	0.60	16,955	28,258	0.60	16,955												
(e) Hired Labor (ktac)	36,535	0.60	21,921	39,441	0.60	23,665												
(f) Unit Net Profit (ktac)	226,121		283,528	223,215		281,784												
(g) Net Profit (Kt)	1,147,365,089		1,438,621,072	1,132,619,696		1,429,805,630												
(h) Accumulated Net Profit (Kt)	1,147,365,089		1,438,621,072	2,279,984,785		2,868,426,902	2,279,984,785		2,868,426,902	2,279,984,785		2,868,426,902	2,279,984,785		2,868,426,902	2,279,984,785		2,868,426,902
1.2 South Nawin																		
1.2.1 Black Gram																		
(a) Increase of Sawn Area (ac)	17,608.66		17,608.66	11,691.16		11,691.16	11,691.16		11,691.16	0	0.00	0	0	0.00	0	0	0.00	0
(b) Gross Profit (Ktac)	250,167	1.07	267,679	328,000	1.07	350,960	328,000	1.07	350,960									
(c) Input Cost (ktac)	38,684	0.77	29,787	37,086	0.77	28,556	37,086	0.77	28,556									
(d) Family Labor (ktac)	26,176	0.60	15,706	28,258	0.60	16,955	28,258	0.60	16,955									
(e) Hired Labor (ktac)	36,535	0.60	21,921	39,441	0.60	23,665	39,441	0.60	23,665									
(f) Unit Net Profit (ktac)	148,772		200,265	223,215		281,784	223,215		281,784									
(g) Net Profit (Kt)	2,619,675,566		3,526,398,295	2,609,642,279		3,294,381,829	2,609,642,279		3,294,381,829									
(h) Accumulated Net Profit (Kt)	2,619,675,566		3,526,398,295	5,229,317,845		6,820,780,124	7,838,960,124		10,115,161,953	7,838,960,124		10,115,161,953	7,838,960,124		10,115,161,953	7,838,960,124		10,115,161,953
1.3 Wegy																		
1.3.1 Black Gram																		
(a) Increase of Sawn Area (ac)							540.38		540.38	540.38		540.38	540.38		540.38	0.00		0.00
(b) Gross Profit (Ktac)							328,000	1.07	350,960	328,000	1.07	350,960	328,000	1.07	350,960	0	1.07	0
(c) Input Cost (ktac)							37,086.00	0.77	28,556	37,086	0.77	28,556	37,086	0.77	28,556	0	0.77	0
(d) Family Labor (ktac)							28,258	0.60	16,955	28,258	0.60	16,955	28,258	0.60	16,955	0	0.60	0
(e) Hired Labor (ktac)							36,535.00	0.60	21,921	36,535	0.60	21,921	36,535	0.60	21,921	0	0.60	0
(f) Unit Net Profit (ktac)							226,121		283,528	226,121		283,528	226,121		283,528	0		0
(g) Net Profit (Kt)							122,191,266		153,212,861	122,191,266		153,212,861	122,191,266		153,212,861	0		0
(h) Accumulated Net Profit (Kt)							122,191,266		153,212,861	244,382,532		306,425,722	366,573,798		459,638,583	366,573,798		459,638,583
1.4 Taung Nyo																		
1.4.1 Black Gram																		
(a) Increase of Sawn Area (ac)							6,142.94		6,142.94	6,142.94		6,142.94	0.00		0.00	0.00		0.00
(b) Gross Profit (Ktac)							328,000	1.07	350,960	328,000	1.07	350,960	0	1.07	0	0	1.07	0
(c) Input Cost (ktac)							37,086	0.77	28,556	37,086	0.77	28,556	0	0.77	0	0	0.77	0
(d) Family Labor (ktac)							28,258	0.60	16,955	28,258	0.60	16,955	0	0.60	0	0	0.60	0
(e) Hired Labor (ktac)							36,535	0.60	21,921	36,535	0.60	21,921	0	0.60	0	0	0.60	0
(f) Unit Net Profit (ktac)							226,121		283,528	226,121		283,528	0		0	0		0
(g) Net Profit (Kt)							1,389,047,736		1,741,695,492	1,389,047,736		1,741,695,492	0		0	0		0
(h) Accumulated Net Profit (Kt)							1,389,047,736		1,741,695,492	2,778,095,472		3,483,390,984	2,778,095,472		3,483,390,984	2,778,095,472		3,483,390,984
Sub-Total (Base Case, Financial)	3,767,040,655		4,965,019,367	7,509,302,630		9,689,207,026	11,630,183,911		14,878,497,208	13,141,422,913		16,773,405,561	13,263,614,179		16,926,618,422	13,263,614,179		16,926,618,422



**Table 3.1.50 Cases for Sensitive Analysis (SA4) / Financial Cost and Benefit Analyses**

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	FIRR =		9.1%		B/C =		0.83	
						Present Value Factor	Present Value		Present Value Factor	Present Value			
							Discount Rate	9.1%		Discount Rate	12.0%		
												Cost	Benefit
1	14,795,323,000		14,795,323,000	0	-14,795,323,000	0.91659	13,561,245,109	0	0.89286	13,210,152,094	0		
2	22,753,580,000	40,140,000	22,793,720,000	3,767,040,655	-19,026,679,345	0.84014	19,149,915,921	3,164,841,536	0.79719	18,170,925,647	3,003,047,140		
3	26,015,115,000	103,016,538	26,118,131,538	7,509,302,630	-18,608,828,908	0.77006	20,112,528,372	5,782,613,583	0.71178	18,590,363,666	5,344,971,426		
4	26,015,117,000	171,118,524	26,186,235,524	11,630,183,911	-14,556,051,613	0.70583	18,483,030,620	8,208,932,710	0.63552	16,641,876,400	7,391,214,479		
5	26,015,115,000	239,220,513	26,254,335,513	13,141,422,913	-13,112,912,600	0.64696	16,985,504,903	8,501,974,968	0.56743	14,897,497,600	7,456,837,604		
6	17,429,706,000	239,220,513	17,668,926,513	13,263,614,179	-4,405,312,334	0.59300	10,477,673,422	7,865,323,208	0.50663	8,951,608,239	6,719,744,852		
7	17,429,706,000	239,220,513	17,668,926,513	13,263,614,179	-4,405,312,334	0.54353	9,603,591,628	7,209,172,215	0.45235	7,992,538,908	5,999,795,874		
8		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.49820	119,179,660	6,607,932,584	0.40388	96,616,381	5,356,908,495		
9		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.45664	109,237,655	6,056,696,779	0.36061	86,265,309	4,782,991,909		
10		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.41855	100,125,746	5,551,485,715	0.32197	77,021,829	4,270,485,857		
11		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.38364	91,774,558	5,088,452,944	0.28748	68,771,113	3,813,023,804		
12		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.35164	84,119,501	4,664,017,290	0.25668	61,403,121	3,404,504,487		
13		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.32231	77,103,164	4,274,995,486	0.22917	54,822,165	3,039,622,461		
14		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.29543	70,672,916	3,918,469,537	0.20462	48,949,301	2,714,000,733		
15		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.27079	64,778,523	3,591,654,084	0.18270	43,705,588	2,423,262,311		
16		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.24820	59,374,531	3,292,029,039	0.16312	39,021,650	2,163,560,745		
17		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.22750	54,422,667	3,017,472,226	0.14564	34,840,076	1,931,712,769		
18		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.20852	49,882,261	2,765,728,829	0.13004	31,108,236	1,724,800,388		
19		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.19113	45,722,217	2,535,074,578	0.11611	27,775,894	1,540,038,242		
20		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.17519	41,909,042	2,323,652,568	0.10367	24,799,991	1,375,038,882		
21		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.16058	38,414,030	2,129,871,165	0.09256	22,142,251	1,227,680,128		
22		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.14718	35,208,475	1,952,138,735	0.08264	19,769,183	1,096,105,076		
23		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.13491	32,273,239	1,789,394,189	0.07379	17,652,082	978,722,090		
24		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.12365	29,579,616	1,640,045,893	0.06588	15,759,847	873,806,902		
25		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.11334	27,113,253	1,503,298,031	0.05882	14,070,951	780,165,786		
26		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.10389	24,852,619	1,377,956,877	0.05252	12,563,861	696,605,017		
27		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.09522	22,778,577	1,262,961,342	0.04689	11,217,050	621,930,869		
28		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.08728	20,879,166	1,157,648,246	0.04187	10,016,163	555,347,526		
29		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.08000	19,137,641	1,061,089,134	0.03738	8,942,063	495,793,898		
30		239,220,513	239,220,513	13,263,614,179	13,024,393,666	0.07333	17,542,040	972,620,828	0.03338	7,985,181	442,739,441		
Total	150,453,662,000	6,534,008,400	156,987,670,400		210,650,634,184		109,609,571,072	109,267,544,319		99,290,181,840	82,224,459,191		
							NPV =	-342,026,753		NPV =	-17,065,722,649		

**Table 3.1.51 Cases for Sensitive Analysis (SA4) / Economic Cost and Benefit Analyses**

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	EIRR =	16.2%		B/C =	1.24	
						Present Value Factor	Present Value		Present Value Factor	Present Value	
	Investment	O & M	Total	Total	Discount Rate		16.2% Benefit	Discount Rate		12.0% Benefit	
						Cost			Benefit		Cost
1	14,795,323,000		14,795,323,000	0	-14,795,323,000	0.86059	12,732,707,021	0	0.89286	13,210,152,094	0
2	22,753,580,000	40,140,000	22,793,720,000	5,233,257,231	-17,560,462,769	0.74061	16,881,256,969	3,875,802,638	0.79719	18,170,925,647	4,171,900,332
3	26,015,115,000	103,016,538	26,118,131,538	11,657,987,292	-14,460,144,246	0.63736	16,646,652,317	7,430,334,780	0.71178	18,590,363,666	8,297,922,195
4	26,015,117,000	171,118,524	26,186,235,524	17,880,101,326	-8,306,134,198	0.54850	14,363,150,185	9,807,235,577	0.63552	16,641,876,400	11,363,161,995
5	26,015,115,000	239,220,513	26,254,335,513	19,876,163,865	-6,378,171,648	0.47203	12,392,833,992	9,382,145,629	0.56743	14,897,497,600	11,278,331,662
6	17,429,706,000	239,220,513	17,668,926,513	19,876,163,865	2,207,237,352	0.40622	7,177,471,328	8,074,095,285	0.50663	8,951,608,239	10,069,860,899
7	17,429,706,000	239,220,513	17,668,926,513	19,876,163,865	2,207,237,352	0.34959	6,176,880,020	6,948,508,126	0.45235	7,992,538,908	8,990,982,724
8		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.30085	71,969,491	5,979,743,899	0.40388	96,616,381	8,027,585,062
9		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.25891	61,936,583	5,146,137,586	0.36061	86,265,309	7,167,543,451
10		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.22281	53,300,723	4,428,608,071	0.32197	77,021,829	6,399,528,480
11		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.19175	45,870,533	3,811,254,421	0.28748	68,771,113	5,713,999,588
12		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.16502	39,476,169	3,279,964,561	0.25668	61,403,121	5,101,813,741
13		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.14201	33,971,705	2,822,614,030	0.22917	54,822,165	4,555,020,473
14		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.12221	29,235,139	2,429,065,986	0.20462	48,949,301	4,067,060,650
15		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.10517	25,158,821	2,090,376,154	0.18270	43,705,588	3,631,375,138
16		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.09051	21,651,849	1,798,991,591	0.16312	39,021,650	3,242,199,850
17		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.07789	18,632,886	1,548,154,403	0.14564	34,840,076	2,894,764,505
18		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.06703	16,034,951	1,332,299,264	0.13004	31,108,236	2,584,696,349
19		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.05769	13,800,631	1,146,655,893	0.11611	27,775,894	2,307,821,386
20		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.04965	11,877,298	986,851,536	0.10367	24,799,991	2,060,561,908
21		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.04272	10,219,500	849,109,720	0.09256	22,142,251	1,839,737,727
22		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.03677	8,796,138	730,846,545	0.08264	19,769,183	1,642,566,182
23		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.03164	7,568,937	628,881,825	0.07379	17,652,082	1,466,662,132
24		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.02723	6,513,975	541,227,942	0.06588	15,759,847	1,309,441,675
25		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.02343	5,604,937	465,698,519	0.05882	14,070,951	1,169,115,959
26		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.02017	4,825,078	400,902,225	0.05252	12,563,861	1,043,896,126
27		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.01736	4,152,868	345,050,205	0.04689	11,217,050	931,993,324
28		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.01494	3,573,954	296,949,888	0.04187	10,016,163	832,214,981
29		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.01285	3,073,984	255,408,706	0.03738	8,942,063	742,971,005
30		239,220,513	239,220,513	19,876,163,865	19,636,943,352	0.01106	2,645,779	219,830,372	0.03338	7,985,181	663,466,350
Total	150,453,662,000	6,534,008,400	156,987,670,400	546,318,349,108	394,563,935,939	6	86,870,843,761	87,052,745,377		99,290,181,840	123,568,195,849
							NPV =	181,901,616		NPV =	24,278,014,009

Table 3.1.52 Cases for Sensitive Analysis (SA5) / Project Cost Estimation

Case	Cost	Benefit	Base Cost and Benefit	Remarks
SA 5 (O&M Cost up)			O&M Cost up to 3%	

	2014年				2015年				2016年				2017年				2018年			
	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic	Financial		Conversion Factor	Economic
	FC	LC			FC	LC			FC	LC			FC	LC			FC	LC		
North Nawn	5,670,597		1.00	5,670,597	3,247,824		1.00	3,247,824	925,100		1.00	925,100								
LC	Total	6,236,877		5,107,801	1,997,549		1.00	1,997,549	367,771		1.00	367,771								
	Material	1,010,000	0.99	1,279,080	771,346	0.99	763,635	568,119	0.99	564,731										
	Skilled Labor	2,019,876	1.00	2,019,876	967,071	1.00	967,071	2,019,876	1.00	2,019,876										
	Unskilled Labor	3,019,751	0.99	1,808,845	699,132	0.99	695,995	599,983	0.99	599,983										
South Nawn	1,592,202		1.00	1,592,202	1,309,617		1.00	1,309,617	4,589,261		1.00	4,589,261								
LC	Total	1,546,430		1,293,830	3,444,986		1.00	3,444,986	3,580,121		1.00	3,580,121								
	Material	711,128	0.99	808,153	1,597,429	0.99	1,581,503	1,762,242	0.99	1,744,630										
	Skilled Labor	414,491	1.00	414,491	711,007	1.00	711,007	1,419,692	1.00	1,419,692										
	Unskilled Labor	618,645	0.99	711,186	1,106,494	0.99	1,062,476	1,348,187	0.99	1,348,187										
Wagon								9,045,784		1.00	9,045,784	8,839,768		1.00	8,839,768	7,449,172		1.00	7,449,172	
LC	Total							8,839,768	8,839,768		1.00	8,839,768	8,839,768		1.00	8,839,768	8,839,768		1.00	8,839,768
	Material							3,117,505	3,117,505	0.99	3,086,461	3,086,461	0.99	3,065,417	2,944,521	0.99	2,913,061	2,913,061	0.99	2,891,061
	Skilled Labor							1,176,889	1,176,889	1.00	1,176,889	1,176,889	1.00	1,176,889	1,176,889	1.00	1,176,889	1,176,889	1.00	1,176,889
	Unskilled Labor							4,551,394	4,551,394	0.99	4,545,374	4,545,374	0.99	4,547,800	4,547,800	0.99	4,547,800	4,547,800	0.99	4,547,800
Taung Nyo							4,855,500		1.00	4,855,500	5,886,708		1.00	5,886,708	3,732,676		1.00	3,732,676		
LC	Total							4,855,500	4,855,500		1.00	4,855,500	4,855,500		1.00	4,855,500	4,855,500		1.00	4,855,500
	Material							2,078,921	2,078,921	0.99	2,057,387	2,057,387	0.99	2,035,853	1,993,915	0.99	1,972,381	1,972,381	0.99	1,950,847
	Skilled Labor							552,000	552,000	1.00	552,000	552,000	1.00	552,000	552,000	1.00	552,000	552,000	1.00	552,000
	Unskilled Labor							2,224,579	2,224,579	0.99	2,224,579	2,224,579	0.99	2,224,579	2,224,579	0.99	2,224,579	2,224,579	0.99	2,224,579
Sub-Total(FC+LC)	7,261,784	7,073,007		13,864,457	8,567,862	8,387,115		11,399,343	20,359,648		16,854,442	34,868,771	14,578,477	10,919,360	24,824,323	11,171,848	1,189,530		8,482,498	
Machineries Procurement	5,914,204		1.00	5,914,204	8,871,366		1.00	8,871,366												
Engineering Service																				
Engineering Service (OD)					2,833,041		1.00	2,833,041												
Engineering Service (SI)					78,814		0.99	78,814												
Total	13,176,988	12,873,007		19,878,659	19,419,148	8,953,904		21,694,939	21,417,788		17,146,362	36,138,640	15,668,817	11,513,071	25,864,136	12,513,988	8,463,290		10,919,360	
Physical Contingency	5%	668,850	393,627	978,891	970,574,000	3,376,729,000		1,082,146,920	1,071,889,210		877,907,000	1,811,922,000	80,930,830	360,864	1,730,707	615,699,000	423,464,500		995,719,400	
Project Management (FC+LC)	10%	726,779	187,304	1,366,442	668,766,200	538,211,500		1,120,454,300	2,079,364,900		1,685,274,200	3,480,573,700	1,441,641,900	1,099,936	2,442,123	1,117,184,800	846,985,000		1,848,139,400	
Sub-Total		14,562,117	9,613,963	21,322,000	21,048,671,800	7,419,390,700		23,828,170	24,439,233		19,932,704	41,631,145	17,847,393,300	12,665,000	39,000,166	14,948,13,700	9,303,412,500		32,759,543	
Grand Total(FC+LC)		15,816,130			28,466,262				44,127,943			44,127,943		30,712,816		23,750,387				
O&M	0.5%				89,831	23,619		58,731,887	97,708,439		433,796,623	121,700,784	142,101,780	94,718,079	332,416,624	208,957,644	128,357,339		310,099,052	

Table 3.1.53 Cases for Sensitive Analysis (SA5) / Project Cost and Benefit Estimation

Particulars	FC/LC	Total	Ratio, %	2014	2015	2016	2017	2018	2019	2020	Remarks
<b>Implementation</b>											
<b>1. Civil &amp; Structure Construction</b>											
1.1 North Nawin	FC	8,853,517,000	49	5,670,592,000	2,257,825,000	925,100,000					
	LC	9,131,937,000	51	6,326,617,000	1,937,549,000	867,771,000					
	(unskilled labors)	4,012,079,000	44	3,014,741,000	698,325,000	299,013,000					
	Sub Total (FC+LC)	17,985,454,000	100	11,997,209,000	4,195,374,000	1,792,871,000	0				
1.2 South Nawin	FC	10,471,300,000	54	1,592,202,000	4,309,837,000	4,569,261,000					
	LC	8,871,117,000	46	1,546,420,000	3,444,566,000	3,880,131,000					
	(unskilled labors)	2,992,881,000	34	618,643,000	1,106,041,000	1,268,197,000					
	Sub Total (FC+LC)	19,342,417,000	100	3,138,622,000	7,754,403,000	8,449,392,000	0				
1.3 Wegyi	FC	25,984,725,000	56			9,945,784,000	8,589,769,000	7,449,172,000			
	LC	20,352,398,000	44			8,576,719,000	6,387,854,000	5,387,825,000			
	(unskilled labors)	6,379,155,000	31			3,248,790,000	1,667,300,000	1,463,065,000			
	Sub Total (FC+LC)	46,337,123,000	100			18,522,503,000	14,977,623,000	12,836,997,000			
1.4 Taung Nyo	FC	14,464,884,000	57			4,855,500,000	5,886,708,000	3,722,676,000			
	LC	10,841,082,000	43			3,527,821,000	4,531,506,000	2,781,755,000			
	(unskilled labors)	2,348,591,000	22			855,372,000	928,794,000	564,425,000			
	Sub Total (FC+LC)	25,305,966,000	100			8,383,321,000	10,418,214,000	6,504,431,000			
Total of Civil & Structure Construction	FC	59,774,426,000	55	7,262,794,000	6,567,662,000	20,295,645,000	14,476,477,000	11,171,848,000			
	LC	49,196,534,000	45	7,873,037,000	5,382,115,000	16,852,442,000	10,919,360,000	8,169,580,000			
	(unskilled labors)	15,732,706,000	32	3,633,384,000	1,804,366,000	5,671,372,000	2,596,094,000	2,027,490,000			
	Total (FC+LC)	108,970,960,000	100	15,135,831,000	11,949,777,000	37,148,087,000	25,392,837,000	19,341,428,000			
<b>2. Machineries Procurement</b>											
	FC	14,785,510,000	99	5,914,204,000	8,871,306,000						
	LC	147,855,100	1		147,855,100						
	Total (FC+LC)	14,933,365,100	100	5,914,204,000	9,019,161,100	0	0				
<b>5. Engineering Service</b>											
<b>5.1 Engineering Service (DD)</b>											
	FC	2,838,040,000	80		2,838,040,000						
	LC	729,824,000	20		729,824,000						
	Total (FC+LC)	3,567,864,000	100		3,567,864,000	0	0				
<b>5.2 Engineering Service (SW)</b>											
	FC	4,326,290,000	80		1,142,140,000	1,142,140,000	1,142,140,000	899,870,000			
	LC	1,112,540,000	20		293,710,000	293,710,000	293,710,000	231,410,000			
	Total (FC+LC)	5,438,830,000	100		1,435,850,000	1,435,850,000	1,435,850,000	1,131,280,000			
1.1 Total of 1. 2. 5 (FC)	FC	81,724,266,000	61	13,176,998,000	19,419,148,000	21,437,785,000	15,618,617,000	12,071,718,000			
1.2 Total of 1. 2. 5 (LC)	LC	51,186,753,100	39	7,873,037,000	6,553,504,100	17,146,152,000	11,213,070,000	8,400,990,000			
1.3 Total of 1. 2. 5 (Unskilled Labors)	(unskilled labors)	15,732,706,000	31	3,633,384,000	1,804,366,000	5,671,372,000	2,596,094,000	2,027,490,000			
1.4 Total of 1. 2. 5 (Grand Total)	Total (FC+LC)	132,911,019,100	100	21,050,035,000	25,972,652,100	38,583,937,000	26,831,687,000	20,472,708,000			
2.1 Physical Contingency (5% of 1.1)	5% FC	4,086,213,300	61	658,849,900	970,957,400	1,071,889,250	780,930,850	603,585,900			
2.2 Physical Contingency (5% of 1.2)	5% LC	2,559,337,655	39	393,651,850	327,675,205	857,307,600	560,653,500	420,049,500			
2.3 Physical Contingency (5% of 1.3)	5% (unskilled labors)	786,635,300	31	181,669,200	90,218,300	283,568,600	129,804,700	101,374,500			
2.4 Physical Contingency (5% of 1.4)	5% Total (FC+LC)	6,645,550,955	100	1,052,501,750	1,298,632,605	1,929,196,850	1,341,584,350	1,023,635,400			
3.1 Total of 1.1 & 2.1	FC	85,810,479,300	61	13,835,847,900	20,390,105,400	22,509,674,250	16,399,547,850	12,675,303,900			
3.2 Total of 1.1 & 2.2	LC	53,746,090,755	39	8,266,688,850	6,881,179,305	18,003,459,600	11,773,723,500	8,821,039,500			
3.3 Total of 1.1 & 2.3	(unskilled labors)	16,519,341,300	31	3,815,053,200	1,894,584,300	5,954,940,600	2,725,898,700	2,128,864,500			
3.4 Total of 1.1 & 2.4	Total (FC+LC)	139,556,570,055	100	22,102,536,750	27,271,284,705	40,513,133,850	28,173,271,350	21,496,343,400			
4. Project Management (10% of 1)	10% LC	10,897,096,000	100	1,513,583,100	1,194,977,700	3,714,808,700	2,539,583,700	1,934,142,800			
5. Others (Miscellaneous, 5% of 1-2)	5% LC	5,744,258,200	100	1,052,501,750	597,488,850	1,857,404,350	1,269,791,850	967,071,400			
6.1 Grand Total Cost for Project Evaluation	FC	85,810,479,300	55	13,835,847,900	20,390,105,400	22,509,674,250	16,399,547,850	12,675,303,900			
6.2 Grand Total Cost for Project Evaluation	LC	70,387,444,955	45	10,832,773,700	8,673,645,855	23,575,672,650	15,583,099,050	11,722,253,700			
6.3 Grand Total Cost for Project Evaluation	Total (FC+LC)	156,197,924,255	100	24,668,621,600	29,063,751,255	46,085,346,900	31,982,646,900	24,397,557,600			
7. Operation and Maintenance	0.30% LC				63,150,105	126,056,919	237,501,180	313,688,691	371,712,975		371,712,975





**Table 3.1.54 Cases for Sensitive Analysis (SA5) / Financial Cost and Benefit Analyses**

Year	Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	FIRR = Present Value Factor	15.3%		B/C = Present Value Factor	1.22	
							Present Value			Present Value	
	Investment	O & M	Total	Total			Discount Rate	15.3%	Discount Rate	12.0%	
						Cost	Benefit	Cost	Benefit		
1	23,616,120,000		23,616,120,000	0	-23,616,120,000	0.86730	20,482,260,876	0	0.89286	21,085,888,903	0
2	28,466,262,000	63,150,000	28,529,412,000	5,195,148,066	-23,334,263,934	0.75221	21,460,109,001	3,907,842,327	0.79719	22,743,361,952	4,141,520,087
3	44,227,943,000	141,068,061	44,369,011,061	13,595,014,920	-30,773,996,141	0.65240	28,946,342,816	8,869,387,734	0.71178	31,580,974,693	9,676,659,720
4	30,712,856,000	256,819,872	30,969,675,872	19,113,096,550	-11,856,579,322	0.56583	17,523,571,699	10,814,763,421	0.63552	19,681,848,410	12,146,755,119
5	23,750,285,000	337,314,933	24,087,599,933	21,599,976,556	-2,487,623,377	0.49074	11,820,748,791	10,599,972,495	0.56743	13,668,026,830	12,256,474,697
6		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.42562	143,567,982	9,193,382,022	0.50663	170,893,865	10,943,196,123
7		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.36914	124,516,434	7,973,415,346	0.45235	152,584,410	9,770,749,395
8		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.32016	107,994,749	6,915,448,494	0.40388	136,234,755	8,723,798,531
9		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.27767	93,662,237	5,997,665,490	0.36061	121,639,138	7,789,167,546
10		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.24083	81,235,555	5,201,922,354	0.32197	108,605,289	6,954,544,452
11		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.20887	70,454,970	4,511,587,103	0.28748	96,971,297	6,209,561,260
12		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.18115	61,104,600	3,912,835,753	0.25668	86,581,997	5,544,281,982
13		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.15712	52,998,922	3,393,788,316	0.22917	77,302,463	4,950,066,627
14		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.13627	45,965,906	2,943,428,805	0.20462	69,021,382	4,419,787,203
15		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.11818	39,863,879	2,552,685,229	0.18270	61,627,438	3,946,315,717
16		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.10250	34,574,781	2,213,997,597	0.16312	55,022,812	3,523,388,176
17		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.08890	29,987,298	1,920,237,916	0.14564	49,126,547	3,145,820,586
18		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.07710	26,006,981	1,665,358,192	0.13004	43,864,434	2,808,860,951
19		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.06687	22,556,250	1,444,390,432	0.11611	39,165,637	2,507,973,278
20		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.05800	19,564,266	1,252,798,640	0.10367	34,969,439	2,239,269,570
21		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.05030	16,966,941	1,086,478,821	0.09256	31,221,870	1,999,293,830
22		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.04363	14,717,051	942,406,977	0.08264	27,875,706	1,785,022,063
23		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.03784	12,763,997	817,343,113	0.07379	24,890,469	1,593,862,270
24		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.03282	11,070,676	708,911,231	0.06588	22,222,308	1,423,006,456
25		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.02846	9,599,983	614,735,333	0.05882	19,840,864	1,270,510,621
26		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.02469	8,328,306	533,303,421	0.05252	17,715,780	1,134,430,769
27		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.02141	7,221,913	462,455,498	0.04689	15,816,697	1,012,822,901
28		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.01857	6,263,938	401,111,565	0.04187	14,123,376	904,391,018
29		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.01610	5,430,770	347,759,623	0.03738	12,608,832	807,407,124
30		337,314,933	337,314,933	21,599,976,556	21,262,661,623	0.01397	4,712,290	301,751,672	0.03338	11,259,572	721,007,217
Total	150,773,466,000	9,231,226,191	160,004,692,191		439,497,957,801		101,284,163,858	101,501,164,920		110,261,287,165	134,349,945,289
							NPV =	217,001,062		NPV =	24,088,658,124

**Table 3.1.55 Cases for Sensitive Analysis (SA4) / Economic Cost and Benefit Analyses**

Cost (kyat)			Benefit (kyat)	Benefit -Cost (kyat)	EIRR = Present Value Factor	22.2% Present Value		B/C = Present Value Factor	1.66 Present Value	
Investment	O & M	Total	Total			Discount Rate	22.2%		Discount Rate	12.0%
						Cost	Benefit		Cost	Benefit
21,924,003,000		21,924,003,000	0	-21,924,003,000	0.81833	17,941,069,375	0	0.89286	19,575,065,319	0
23,858,120,000	63,150,000	23,921,270,000	6,684,353,535	-17,236,916,465	0.66966	16,019,117,668	4,476,244,188	0.79719	19,069,797,231	5,328,699,795
41,531,145,000	141,068,061	41,672,213,061	17,053,505,075	-24,618,707,986	0.54801	22,836,789,480	9,345,491,316	0.71178	29,661,447,813	12,138,343,842
29,600,465,000	256,819,872	29,857,284,872	24,053,704,606	-5,803,580,266	0.44845	13,389,499,401	10,786,883,831	0.63552	18,974,901,682	15,286,610,351
22,759,543,000	337,314,933	23,096,857,933	27,165,281,249	4,068,423,316	0.36698	8,476,084,924	9,969,114,913	0.56743	13,105,850,097	15,414,395,539
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.30031	101,299,048	8,158,005,612	0.50663	170,893,865	13,762,746,439
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.24575	82,895,145	6,675,867,867	0.45235	152,584,410	12,288,214,973
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.20111	67,837,406	5,463,209,712	0.40388	136,234,755	10,971,513,791
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.16457	55,511,919	4,470,590,335	0.36061	121,639,138	9,796,072,071
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.13468	45,429,575	3,658,620,079	0.32197	108,605,289	8,746,405,604
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.11021	37,175,479	2,993,885,646	0.28748	96,971,297	7,809,475,053
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.09019	30,422,434	2,450,036,716	0.25668	86,581,997	6,972,784,391
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.07380	24,893,842	2,004,797,756	0.22917	77,302,463	6,225,467,504
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.06040	20,373,822	1,640,782,987	0.20462	69,021,382	5,558,559,849
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.04942	16,670,104	1,342,508,199	0.18270	61,627,438	4,963,096,884
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.04044	13,641,016	1,098,563,974	0.16312	55,022,812	4,431,200,677
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.03310	11,165,124	899,170,809	0.14564	49,126,547	3,956,351,561
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.02708	9,134,488	735,635,816	0.13004	43,864,434	3,532,573,174
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.02216	7,474,899	601,982,632	0.11611	39,165,637	3,154,160,806
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.01814	6,118,893	492,778,202	0.10367	34,969,439	2,816,224,707
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.01484	5,005,754	403,132,774	0.09256	31,221,870	2,514,418,432
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.01215	4,098,376	330,058,167	0.08264	27,875,706	2,244,938,842
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00994	3,352,910	270,022,896	0.07379	24,890,469	2,004,526,103
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00813	2,742,370	220,853,737	0.06588	22,222,308	1,789,648,729
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00666	2,246,517	180,920,773	0.05882	19,840,864	1,597,861,843
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00545	1,838,366	148,050,783	0.05252	17,715,780	1,426,720,571
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00446	1,504,425	121,157,154	0.04689	15,816,697	1,273,780,038
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00365	1,231,200	99,153,277	0.04187	14,123,376	1,137,410,326
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00298	1,005,199	80,952,538	0.03738	12,608,832	1,015,438,213
	337,314,933	337,314,933	27,165,281,249	26,827,966,316	0.00244	823,208	66,283,286	0.03338	11,259,572	906,777,088
139,673,276,000	9,231,226,191	148,904,502,191	747,404,522,155	605,184,373,499	4	79,216,452,207	79,184,755,975		101,888,248,519	169,064,417,196
						NPV =	-31,696,232		NPV =	67,176,168,677

# **APPENDIX-V**

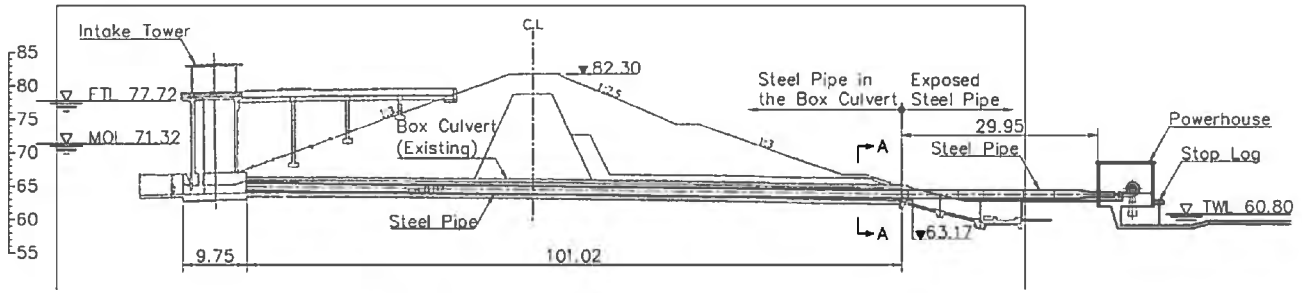
## **SMALL HYDROELECTRIC GENERATION**

# APPENDIX V: SMALL HYDROELECTRIC GENERATION

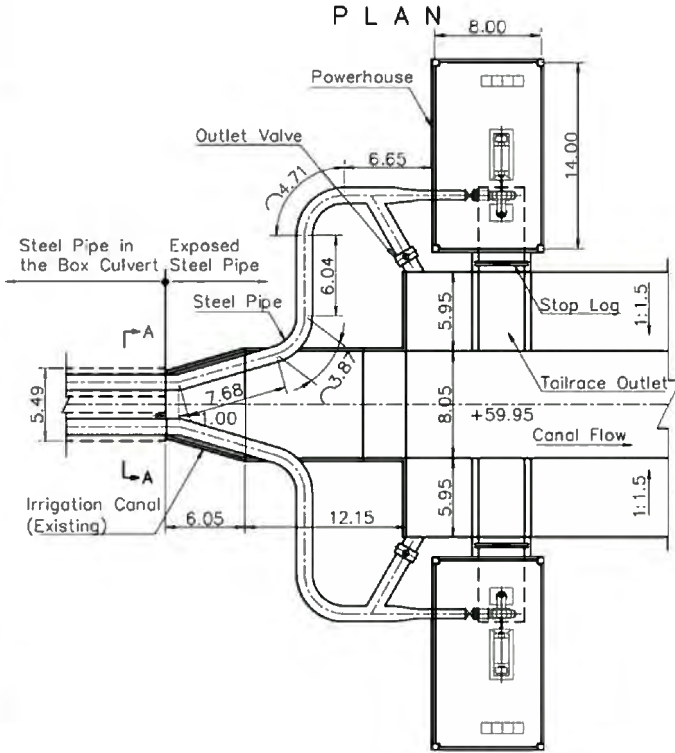
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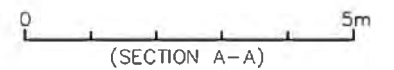
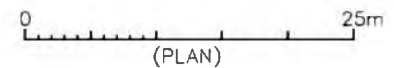
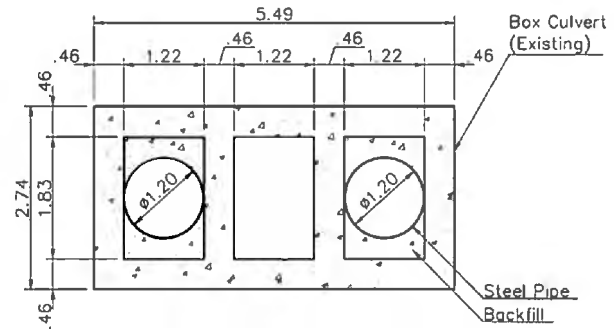
### PROFILE



### PLAN



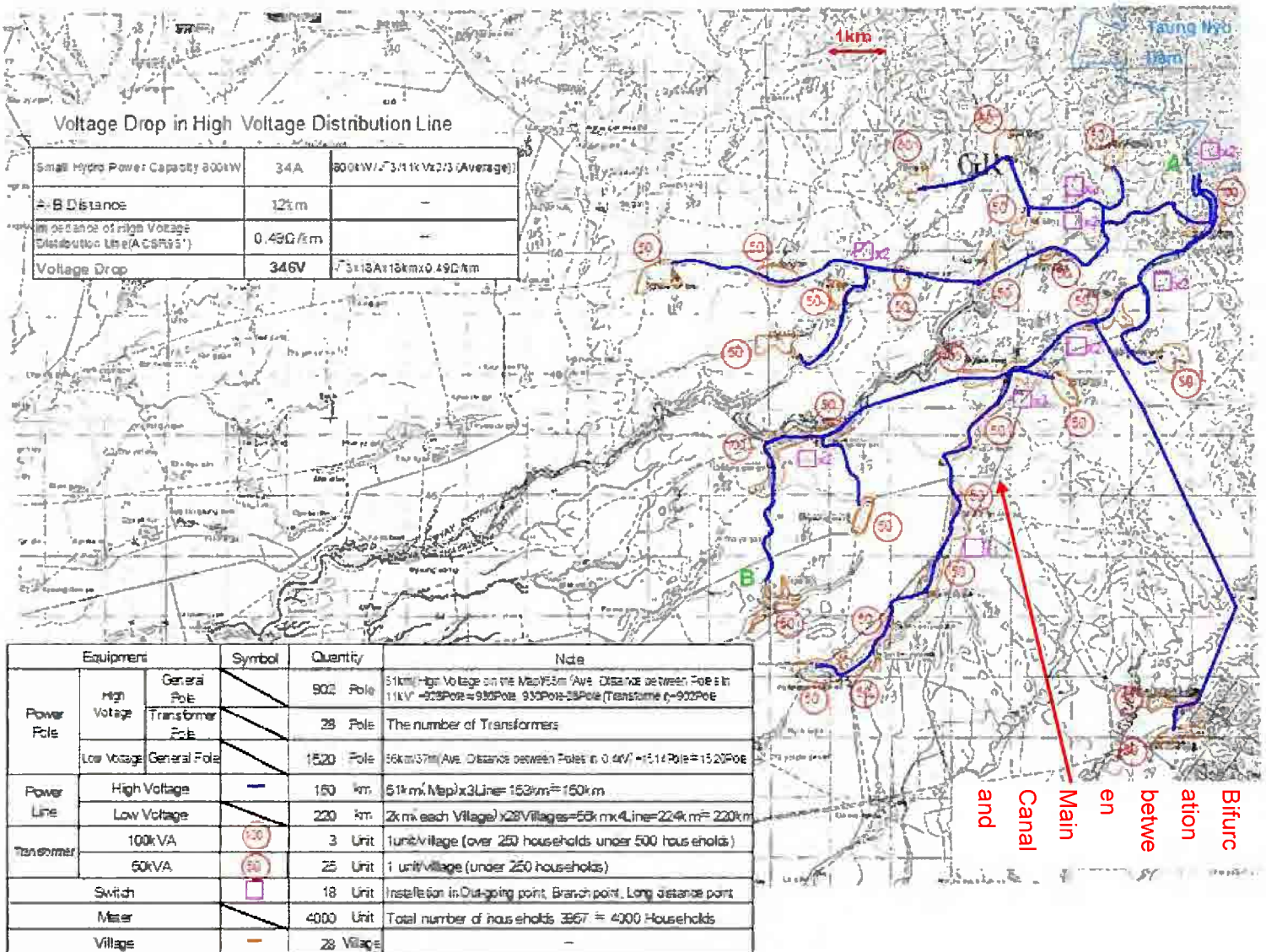
### SECTION A-A



### Appendix 5.1 Conceptual Arrangement of Hydroelectric Power Plant at Taung Nyo Dam

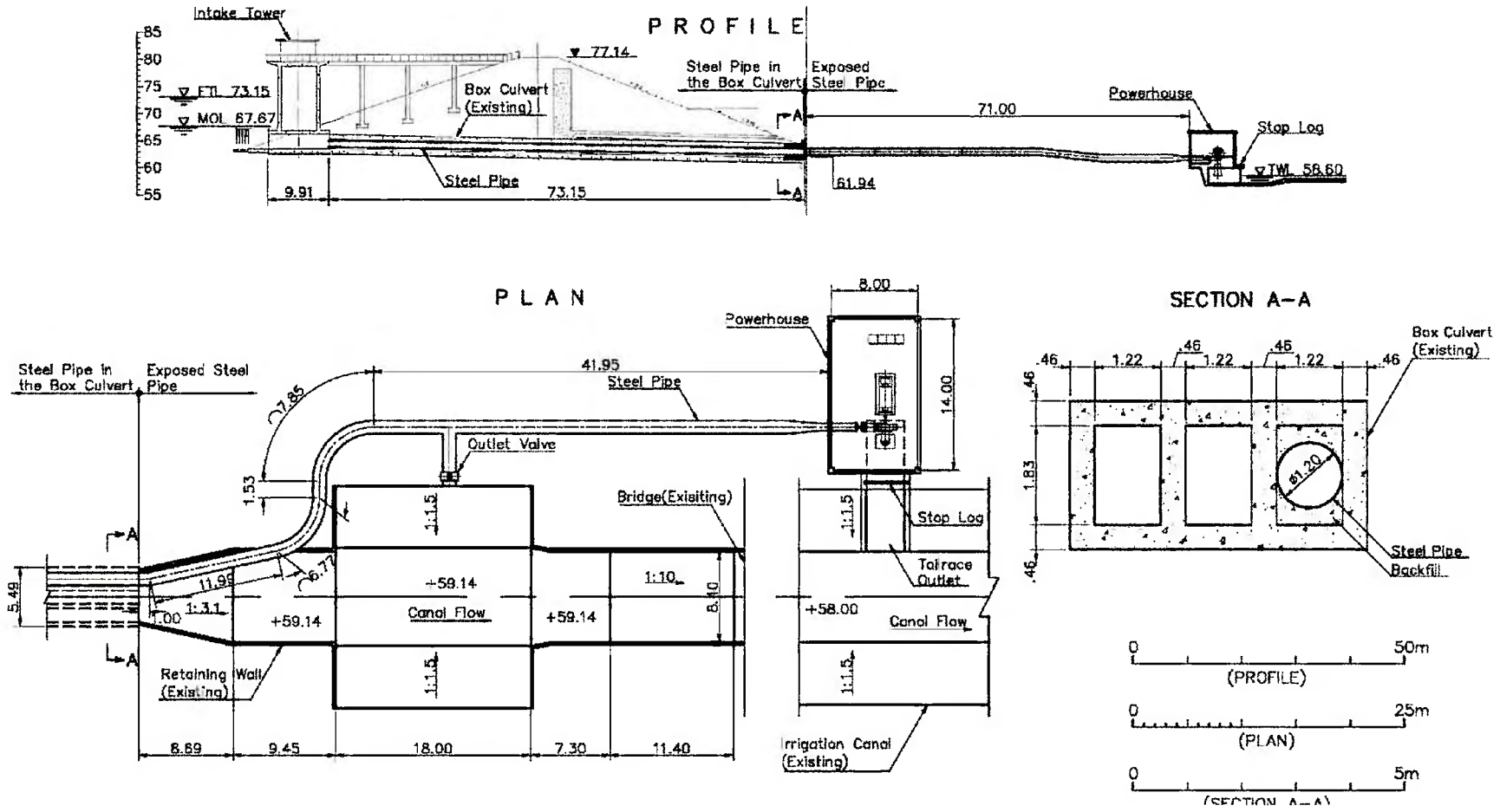
Source: Final Report of Feasibility Study on Small Scale Hydropower Development with Existing Irrigation Dams

### Taung Nyo Dam: Small Hvdro Power Capacity 800kW



#### Appendix 5.2 Conceptual Arrangement of Distribution Facility in the Hydroelectric Power Development in Taung Nyo Dam

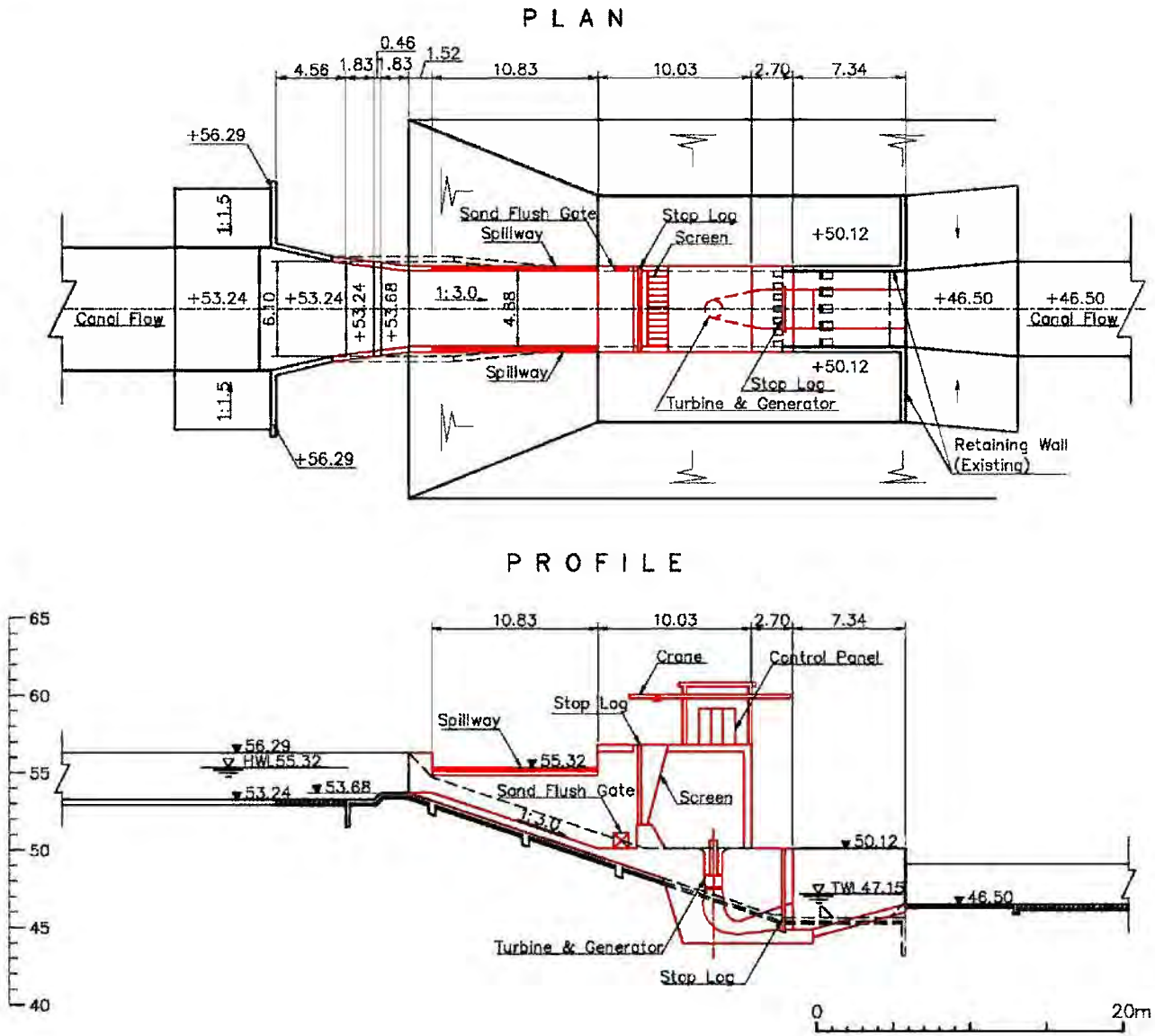
Source: Final Report of Feasibility Study on Small Scale Hydropower Development with Existing Irrigation Dams



Appendix 5.3 Conceptual Arrangement of Hydroelectric Power Plant at Weyyi Dam

Source: Final Report of Feasibility Study on Small Scale Hydropower Development with Existing Irrigation Dams

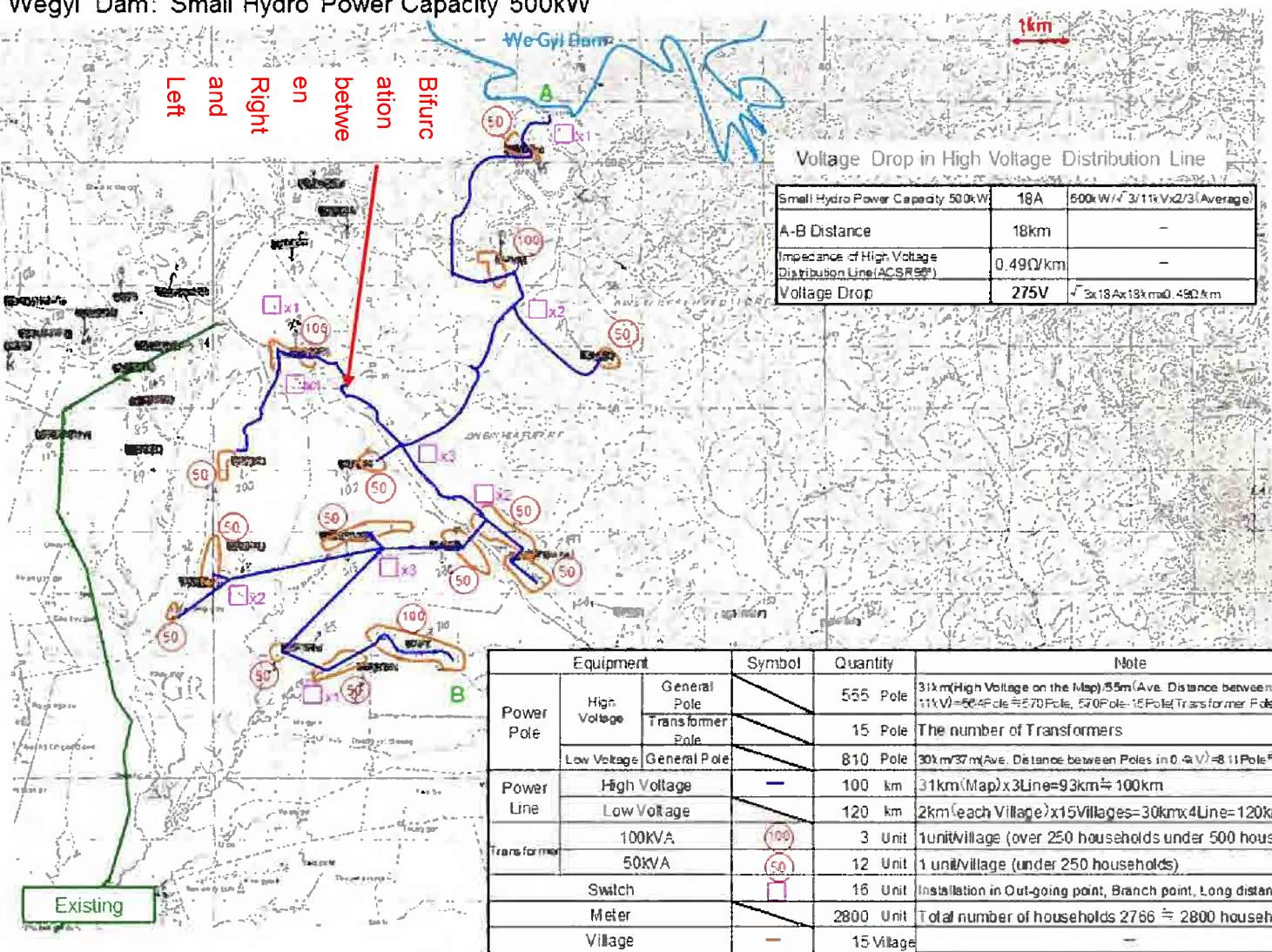




**Appendix 5.4 Conceptual Arrangement of Hydroelectric Power Plant at No. 1 Drop Structure in Wegyi Right Main Canal**

Source: Final Report of Feasibility Study on Small Scale Hydropower Development with Existing Irrigation Dams

Wegyi Dam: Small Hydro Power Capacity 500kW



Appendix 5.5 Conceptual Arrangement of Distribution Facility in the Hydroelectric Power Development in Wegyi Dam and Wegyi Right Main Canal

Source: Final Report of Feasibility Study on Small Scale Hydropower Development with Existing Irrigation Dams

# **APPENDIX- VI**

## **PROCUREMENT OF MACHINERIES**

# **APPENDIX VI: PROCUREMENT OF MACHINERIES**

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## CHAPTER 1 PROCUREMENT OF MACHINERIES

### 1.1 Procurement of Construction Machines

The equipment list is prepared, as shown below, for the required construction machineries for the rehabilitation works in Wegyi and Taung Nyo Irrigation Schemes. For North Nawin and South Nawin Irrigation Schemes, the Irrigation Department shall allocate the existing machineries. The following table shows; i) the necessary machineries, ii) their specifications and quantities, iii) necessary units by site, and iv) necessary arrangement of the existing machineries owned by the Irrigation Department.

**Table 1.1.1 Equipment List for Construction Machineries**

No.	Equipment Name	Specifications	Quantity described in the Minutes of Discussion on 30 October, 2013	Necessary Units by Site					Quantity described in New Request on 17 July, 2014	Arranged By ID for 1-2 Year for NN/SN
				NN	SN	WG	TN	Road		
1	Hydraulic Excavator, Standard	20-25 ton class, long crawler type, 1.0m <sup>3</sup> bucket, 120-150kW, Tier-2	16 units	3	4	4	4	1	9	7
2	Hydraulic Excavator, Long Arm	23-28 ton class, long crawler type, 0.45m <sup>3</sup> bucket, 130-160 kW, 15m long arm & boom, Tier-2	8 units	-	4	2	2	-	4	4
3	Hydraulic Excavator, Small Size	6-7 ton class, crawler type, 0.19-0.28 m <sup>3</sup> bucket, 45-50 kW, Tier-2	20 units	5	5	8	2	-	20	10
4	Hydraulic Breaker/Hammer with Base Machine	20-25 ton class, long crawler type, 120-150kW, Tier-2, equipped with 1300 kg Breaker and Vibro-Hammer	1 unit	-	-	-	-	1	1	-
5	Tracked Dozer, Class II	21ton class, 150kW output, Tier-2	8 units	1	2	2	2	1	-	3
6	Tracked Dozer, Class III	9-10 ton class, 75-100kW, Tier-2	8 units	1	2	2	2	1	6	3
7	Wheel Loader	10-13 ton class, standard type, 2.3m <sup>3</sup> teeth excavating bucket, 120-150 kW, Tier-2	2 units	1		1		-	2	1
8	Earth Work Vibration Roller	10-12 ton class, steering type, single drum roller, 80-110kW, Tier-2	4 units	1	1	1	1	(1)	2	2
9	Agitator Truck (Concrete Mixer Truck)	6×4 drive, drum capacity 9.0m <sup>3</sup> , 230-250kW, Tier-2	8 units	2	2	2	2	(2)	8	4

10	Lowbed Semi-Trailer Truck	Trailer maximum loading capacity 25 ton, 230-250kW, Tier-2	2 units	1	1	1	1	-	2	2
11	Dump Truck	4x4 drive, maximum loading capacity 6-7t, 165kW	10 units	2	2	3	3	-	-	10
12	Concrete Pump Truck	Boom type, 15m boom length, 80m <sup>3</sup> /hr concrete pumping capacity, 230-250kW, Tier-2	2 units	1		1		-	1	1
13	Mobile Workshop	4x4 drive, 170-200kW, Tier-2, equipped with tools in aluminum van body	1 lot			1			1	-

Note: Note: The numbers in parentheses mean the units for access road rehabilitation to be utilized also for irrigation rehabilitation works.

Abbreviations:

NN: North Nawin Irrigation Scheme

SN: South Nawin Irrigation Scheme

WG: Wegyi Irrigation Scheme

TN: Taung Nyo Irrigation Scheme

## 1.2 Procurement of Agricultural Machines

The agricultural machineries shall be procured by the strong request by MOAI. The tilling and harvesting services are conducted by Agricultural Mechanization Stations (AMS) of Agricultural Mechanization Department (AMD) in township level. However, AMD does not provide presently the services to Paungde Township in Wegyi Irrigation Scheme. Therefore, AMD will establish a new sub-station at Paungde. Therefore, total five (5) AMSs and Sub-AMS will provide the services for four irrigation schemes. All existing tractors will be replaced by new machineries. The following table shows the machineries and the implements for each AMS. The 15 units of tractors procured under 2012FY 2KR project are not included.

**Table 1.2.1 Equipment List for Agricultural Machineries**

Sr.No.	Description	No.30 AMS (Pyay Tsp)	No.58 AMS (Paukhaung Tsp)	No.45 AMS (Nattalin Tsp)	No.94 AMS (Thegone Tsp)	SUB AMS (Paungde Tsp)
1	Tractor Set, 47 HP					
1-1	Tractor, 47 HP	20	29	29	29	13
1-2	Plough Type Disc Harrow (6 discs, for 47 HP)	20	29	29	29	13
1-3	Rotavator (for 47 HP)	20	29	29	29	13
1-4	Front Dozer (for 47 HP)	6	6	5	5	3
2	Tractor Set, 68 HP					
2-1	Tractor, 68 HP	18	18	18	18	8
2-2	Disc Plough (4 discs, for 68HP)	6	6	5	5	3
2-3	Plough Type Disc Harrow (7 discs, for 68 HP)	7	7	9	9	3
2-4	Offset Harrow (18 discs, for 68 HP)	5	5	4	4	2
2-5	Rotavator (for 68 HP)	18	18	18	18	8

2-6	Front Dozer (for 68 HP)	5	5	4	4	2
3	Combine Harvester Set					
3-1	Combine Harvester, 68HP	5	5	5	5	5
3-2	Low Bed Trailer and Tractor	1	1	1	1	1
4	Mini Excavator	1	1	1	1	1
5	Workshop Tools					
5-1	Engine-driven Air Compressor	1	1	1	1	1
5-2	Hydraulic Floor Jack	1	1	1	1	1
5-3	Engineering Tool Set	1	1	1	1	1

**CHAPTER 2 BIDDING DOCUMENTS**

The Bidding shall be conducted in two (2) lots or more. The Bidding Documents (Draft) for Construction Machineries and the Bidding Documents (Draft) for Agricultural Machineries are attached hereto.

- 2.1 Bidding Documents (Draft) for Construction Machineries ..... VI-2-2
- 2.2 Bidding Document (Draft) for Agricultural Machineries ..... VI-2-15



2.1 **Bidding Documents (Draft) for Construction Machineries**

BIDDING DOCUMENTS

for

**Procurement of  
Construction Machineries**

**Purchaser:** Ministry of Agriculture and Irrigation

**Country:** Republic of the Union of Myanmar

**Project:** Project for Rehabilitation of Irrigation  
Facilities in Bago (West) Region

**Loan No.:** [*insert number of Loan Agreement*]

## Section II. Bid Data Sheet

### Bid Data Sheet

<b>C. Preparation of Bids</b>	
<b>ITB 14.8 (a)(iii) and (b)(ii)</b>	“Final destination (Project Site)”: Mechanical Circle (3) Workshop of Irrigation Department, Pyay Township, Pyay District, Bago (West) Region
<b>ITB 14.8 (b)(i)</b>	“Place of destination (Delivery Site)”: CIP Yangon at Specified Warehouse in Mechanical Circle (1) Procurement Store of Irrigation Department, 8-1/2 miles, Mayangon Township, Northern District, Yangon
<b>ITB 18.3</b>	Period of time the Goods are expected to be functioning for operation and maintenance of tractors with implements, combine harvesters and excavators: One (1) Year after issue of complete certificate
<b>ITB 19.1 (a)</b>	Manufacturer’s Authorization is: required for all Goods.
<b>ITB 19.1 (b)</b>	The Bidder is required to be represented by an agent in the country equipped and able to carry out the Supplier’s maintenance, repair and spare parts-stocking obligations.

## Section VI. Schedule of Requirements

### Notes for Preparing the Schedule of Requirements

The Schedule of Requirements shall be included in the Bidding Documents by the Purchaser, and shall cover, at a minimum, a description of the Goods and Related Services to be supplied and the Delivery Schedules.

The objective of the Schedule of Requirements is to provide sufficient information to enable Bidders to prepare their Bids efficiently and accurately, in particular, the Price Schedule, for which a form is provided in Section IV. In addition, the Schedule of Requirements, together with the Price Schedule, should serve as a basis in the event of quantity variation at the time of award of contract pursuant to ITB 41.

The date or period for delivery should be carefully specified, taking into account (a) the implications of delivery terms stipulated in the Instructions to Bidders pursuant to the *Incoterms* rules (i.e., EXW, or CIF, CIP, FOB, FCA terms—that “delivery” takes place when goods are delivered to the carriers), and (b) the date prescribed herein from which the Purchaser’s delivery obligations start (i.e., notice of award, contract signature, opening or confirmation of the letter of credit).

## 1. List of Goods and Delivery Schedule

[The Purchaser shall fill in this table, with the exception of the column "Bidder's offered delivery date" to be filled by the Bidder.]

Line Item No	Description of Goods	Quantity	Physical unit	Final destination (Project Site) as specified in BDS	Delivery (as per Incoterms) date		
					Earliest delivery date	Latest delivery date	Bidder's offered delivery date [to be provided by the Bidder]
1	Hydraulic Excavator, Standard		9 units	Mechanical Circle (3) Workshop of Irrigation Department, Pyay, Township, Pyay District, Bago (West) Region	[insert the number of days following the date of effectiveness the Contract]	[insert the number of days following the date of effectiveness the Contract]	[insert the number of days following the date of effectiveness the Contract]
2	Hydraulic Excavator, Long Arm		4 units				
3	Hydraulic Excavator, Small Size		20 units				
4	Hydraulic Breaker/ Hammer with Base Machine		1 unit				
5	Tracked Dozer, Class III		6 units				
6	Wheel Loader		2 units				
7	Earth Work Vibration Roller		2 units				
8	Agitator Truck (Concrete Mixer Truck)		8 units				

9	Lowbed Semi-Trailer Truck		2 units				
10	Concrete Pump Truck		1 unit				
11	Mobile Workshop		1 unit				

## 2. List of Related Services and Delivery Schedule

*[This table shall be filled in by the Purchaser. The required delivery dates of Services should be realistic, and consistent with the required Goods delivery dates (as per Incoterms).]*

Item No	Description of Service	Quantity	Physical unit	Place where Services shall be delivered	Final delivery date(s) of Services
1	Product Test participated by ID engineers in Japan or other manufacturing country borne by the Supplier	1 lot	3 persons for 8 days	Manufacturer's factories	
2	Dispatch of engineer (s) for Quantity Inspection for the Goods	1 lot	1 person or more	The Delivery Site at Mechanical Circle (1) Procurement Store of Irrigation Department, 8-1/2 miles, Mayangon Township, Northern District, Yangon	

3	Dispatch of engineer(s) for Test-run, Initial Instruction and Final inspection for the Goods without spare parts	1 lot	3 persons for excavators, tracked dozers and heavy vehicles, or more	The Project Site at Mechanical Circle (3) Workshop of Irrigation Department, Pyay Township, Pyay District, Bago (West) Region	
4	Dispatch of engineers for training	1 lot	2 days for excavators, 2 days for tracked dozers 1 day for heavy vehicles	Mechanical Circle (1) Training Center of Irrigation Department, 8-1/2 miles, Mayangon Township, Northern District, Yangon	
5	Supply of repairing advices and arrangement of spare parts after the warranty period	1 lot	1 qualified engineer for excavator, 1 for tracked dozer and 1 for heavy vehicles, or more, of the agents appointed by the Manufacturers	Each agent should be located at Pyay District, Bago (West) Region or Yangon.	

### 3. Technical Specifications

#### Notes on Technical Specifications

The purpose of the Technical Specifications (TS) is to define the technical characteristics of the Goods and Related Services required by the Purchaser. The Purchaser shall prepare the detailed TS by taking into account that:

- The TS constitute the benchmarks against which the Purchaser will verify the technical responsiveness of Bids and subsequently evaluate the Bids. Therefore, well-defined TS will facilitate preparation of responsive Bids by Bidders, as well as examination, evaluation, and comparison of the Bids by the Purchaser.
- The TS shall require that all Goods and materials to be incorporated in the Goods be new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided for otherwise in the contract.
- The TS shall make use of best practices. Samples of specifications from successful similar procurements in the same country or sector may provide a sound basis for drafting the TS.
- The use of metric units is encouraged.
- Standardizing technical specifications may be advantageous, depending on the complexity of the Goods and the repetitiveness of the type of procurement. The TS should be broad enough to avoid restrictions on workmanship, materials, and equipment commonly used in manufacturing similar kinds of goods.
- Standards for equipment, materials, and workmanship specified in the Bidding Documents shall not be restrictive. Recognized international standards should be specified as much as possible. Reference to brand names, catalogue numbers, or other details that limit any materials or items to a specific manufacturer should be avoided as far as possible. Where unavoidable, such item description should always be followed by the words “or substantially equivalent.” When other particular standards or codes of practice are referred to in the TS, whether from the Borrower’s or from other eligible source countries, a statement should follow other authoritative standards that ensure at least a substantially equal quality, then the standards mentioned in the TS will also be acceptable.
- The TS shall be fully descriptive of the requirements in respect of, but not limited to, the following:
  - (a) Standards of materials and workmanship required for the production and manufacturing of the Goods.

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- (b) Detailed tests required (type and number).
- (c) Other additional work and/or Related Services required to achieve full delivery.
- (d) Detailed activities to be performed by the Supplier, and participation of the Purchaser thereon.
- (e) List of detailed functional guarantees covered by the Warranty and the specification of the liquidated damages to be applied in the event that such guarantees are not met.
- The TS shall specify all essential technical and performance characteristics and requirements, including guaranteed or acceptable maximum or minimum values, as appropriate. Whenever necessary, the Purchaser shall include an additional ad-hoc Bidding Form (to be an Attachment to the Letter of Bid), where the Bidder shall provide detailed information on such technical performance characteristics in respect to the corresponding acceptable or guaranteed values.

When the Purchaser requests that the Bidder provides in its Bid a part or all of the TS, technical schedules, or other technical information, the Purchaser shall specify in detail the nature and extent of the required information and the manner in which it has to be presented by the Bidder in its Bid.

***“Summary of Technical Specifications. The Goods and Related Services shall comply with following Technical Specifications and Standards:***

<i>Item No</i>	<i>Name of Goods or Related Service</i>	<i>Technical Specifications and Standards</i>
1	Hydraulic Excavator, Standard	20-25 ton class, long crawler type, 1.0m <sup>3</sup> bucket, 120-150kW, Tier-2
2	Hydraulic Excavator, Long Arm	23-28 ton class, long crawler type, 0.45m <sup>3</sup> bucket, 130-160 kW, 15m long arm & boom, Tier-2
3	Hydraulic Excavator, Small Size	6-7 ton class, crawler type, 0.19-0.28 m <sup>3</sup> bucket, 45-50 kW, Tier-2
4	Hydraulic Breaker/ Hammer with Base Machine	20-25 ton class, long crawler type, 120-150kW, Tier-2, equipped with 1300 kg Breaker and Vibro-Hammer
5	Tracked Dozer, Class III	9-10 ton class, 75-100kW, Tier-2
6	Wheel Loader	10-13 ton class, standard type, 2.3m <sup>3</sup> teeth excavating bucket, 120-150 kW, Tier-2
7	Earth Work Vibration Roller	10-12 ton class, steering type, single drum roller, 80-110kW, Tier-2
8	Agitator Truck (Concrete Mixer Truck)	6×4 drive, drum capacity 9.0m <sup>3</sup> , 230-250kW, Tier-2



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9	Lowbed Semi-Trailer Truck	Trailer maximum loading capacity 25 ton, 230-250kW, Tier-2
10	Concrete Pump Truck	Boom type, 15m boom length, 80m <sup>3</sup> /hr concrete pumping capacity, 230-250kW, Tier-2
11	Mobile Workshop	4×4 drive, 170-200kW, Tier-2, equipped with tools in aluminum van body

## 4. Inspections and Tests

The following inspections and tests shall be performed:

<b>Inspection and Test</b>	<b>Description</b>	<b>Place</b>
1. Product Test	Tested by the Manufacturer(s) for assembled machineries	Manufacturers' factories
2. Pre-shipping Inspection	Inspected by the third party	Shipping warehouse(s) in the exporting countries of the final products
3. Quantity Inspection	Inspected by the Purchaser and the Consultant	The Delivery Site at Mechanical Circle (1) Procurement Store of Irrigation Department, 8-1/2 miles, Mayangon Township, Northern District, Yangon
4. Test-run, Initial Instruction and Final Inspection	Inspected by the Purchaser and the Consultant	The Project Site at Mechanical Circle (3) Workshop of Irrigation Department, Pyay Township, Pyay District, Bago (West) Region

## Section VIII. Particular Conditions (PC)

### Particular Conditions (PC)

<b>GC 1.1(l)</b>	The Project Site/final destination are: Mechanical Circle (3) Workshop of Irrigation Department, Pyay Township, Pyay District, Bago (West) Region
<b>GC 1.1(m)</b>	The Purchaser is: Irrigation Department, Ministry of Agriculture and Irrigation.
<b>GC 1.1(n)</b>	The Purchaser's Country is: Republic of the Union of Myanmar.
<b>GC 5.1</b>	The language shall be: English.
<b>GC 11.1</b>	<p>Details of Shipping and other Documents to be furnished by the Supplier are a negotiable bill of lading, a non-negotiable sea way bill, (an airway bill, a railway consignment note, a road consignment note, if necessary), insurance certificate, Manufacturer's product inspection reports, Supplier's shipping lists, pre-shipping inspection certificate issued by nominated inspection agency, Manufacturer's or Supplier's warranty certificate and necessary technical documents.</p> <p>The above documents shall be received by the Purchaser before arrival of the Goods and, if not received, the Supplier will be responsible for any consequent expenses.</p>
<b>GC 14.1</b>	<p>The method and conditions of payment to be made to the Supplier under this Contract shall be as follows:</p> <p><b>Payment for the Goods and Related Services supplied from outside Purchaser's Country:</b></p> <p>Payment of foreign currency portion shall be made in [<i>insert foreign currency of the Contract Price</i>] in the following manner:</p> <p>(i) <b>Advance Payment:</b> Ten (10) percent of the Contract Price shall be paid, upon signing of the Contract, within forty-five (45) days after receipt of invoice and a bank guarantee for the equivalent amount valid until the Goods and Related Services are delivered and in the form provided in the Bidding Documents or another form acceptable to the Purchaser.</p> <p>(ii) <b>On Shipment:</b> Eighty (80) percent of the Contract Price shall be paid through an irrevocable letter of credit opened in favor of the Supplier against the documents specified in the letter of</p>

	<p>credit.</p> <p>(iii) <b>On Acceptance:</b> Ten (10) percent of the Contract Price shall be paid within forty-five (45) days after receipt of invoice and a certificate from the Purchaser declaring that the Goods and Related Services have been delivered and accepted.</p> <p><b>Payment for the Goods and Related Services supplied from the Purchaser's Country:</b></p> <p>Payment for local currency portion shall be made in Myanmar Kyat (MMK) in the following manner:</p> <p>(i) <b>Advance Payment:</b> Ten (10) percent of the Contract Price shall be paid, upon signing of the Contract, within forty-five (45) days after receipt of invoice and a bank guarantee for the equivalent amount valid until the Goods and Related Services are delivered and in the form provided in the Bidding Documents or another form acceptable to the Purchaser.</p> <p>(ii) <b>On Delivery:</b> Eighty (80) percent of the Contract Price shall be paid within forty-five (45) days after receipt of invoice and the documents specified in GC Clause 11.</p> <p>(iii) <b>On Acceptance:</b> Ten (10) percent of the Contract Price shall be paid within forty-five (45) days after receipt of invoice and a certificate from the Purchaser declaring that the Goods and Related Services have been delivered and accepted.</p>
<b>GC 16.1</b>	<p>A Performance Security shall be required.</p> <p>The amount of the Performance Security shall be: ten percent (10%) of the contract price.</p>
<b>GC 22.1</b>	<p>The insurance coverage shall be as specified in the Incoterms.</p>
<b>GC 23.1</b>	<p>Responsibility for transportation shall be as follows:</p> <p>The Supplier is required under the Contract to transport the Goods to the Delivery Site at specified Warehouse in Yangon with transport insurance. The related costs shall be included in the Contract Price.</p> <p>The Purchaser shall be responsible for custom clearance, store at the Delivery Site and transport from the Delivery Site to the Project Sites within the Purchaser's Country, defined as the Project Site, transport to such place of destination in the Purchaser's Country.</p>

## Section VI. Schedule of Requirements

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<b>GC 24.1</b>	The inspections and tests shall be: 1) product tests by the Manufacturers, 2) pre-shipping inspection by the third parties for all goods, 3) quantity inspection for all Goods including spare parts and 4) final inspection for all Goods excluding spare parts.
<b>GC 24.2</b>	The inspections and tests shall be conducted at: 1) at the Manufacturer's Factory(ies) for product tests, 2) at shipper's warehouse(s) for pre-shipping inspection, and 3) at the Delivery Site for quantity inspection and 4) at the Project Site for final inspection.
<b>GC 25.1</b>	The liquidated damage shall be: zero point five percent (0.5 %) per week.
<b>GC 25.1</b>	The maximum amount of liquidated damages shall be: ten percent (10 %) of the Contract Price.
<b>GC 26.3</b>	The period of validity of the warranty shall be: three hundred sixty five (365) days.
<b>GC 26.3</b>	For the purposes of the warranty, the place of final destination shall be: at Mechanical Circle (3) Workshop of Irrigation Department, Pyay Township, Pyay District, Bago (West) Region

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**2.2 Bidding Documents (Draft) for Agricultural Machineries**

Section II. Bid Data Sheet

BDS-1

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**BIDDING DOCUMENTS**

**for**

**Procurement of**

**Agricultural Machineries**

**Purchaser:** Ministry of Agriculture and Irrigation

**Country:** Republic of the Union of Myanmar

**Project:** Project for Rehabilitation of Irrigation  
Facilities in Bago (West) Region

**Loan No.:** [*insert number of Loan Agreement*]

## Section II. Bid Data Sheet

### Bid Data Sheet

<b>C. Preparation of Bids</b>	
<b>ITB 14.8 (a)(iii) and (b)(ii)</b>	“Final destination (Project Site)”: Five (5) Agricultural Mechanization Stations of Agricultural Mechanization Department at Pyay, Paukkhaung, Thegone and Paungde Townships, Pyay District and Nattalin Township in Ayeyawaddy District, Bago (West) Region
<b>ITB 14.8 (b)(i)</b>	Place of destination (Delivery Site): CIP Yangon at the Warehouse in the Base Store Depot (A) of Agricultural Mechanization Department, Kyaik Kalawt, Mingaladone Township, Northern District, Yangon
<b>ITB 18.3</b>	Period of time the Goods are expected to be functioning for operation and maintenance of tractors with implements, combine harvesters and excavators: One (1) Year after issue of complete certificate
<b>ITB 19.1 (a)</b>	Manufacturer’s Authorization is: required for tractors, combine harvesters and excavators
<b>ITB 19.1 (b)</b>	The Bidder is required to be represented by an agent in the country equipped and able to carry out the Supplier’s maintenance, repair and spare parts-stocking obligations.

## Section VI. Schedule of Requirements

### Notes for Preparing the Schedule of Requirements

The Schedule of Requirements shall be included in the Bidding Documents by the Purchaser, and shall cover, at a minimum, a description of the Goods and Related Services to be supplied and the Delivery Schedules.

The objective of the Schedule of Requirements is to provide sufficient information to enable Bidders to prepare their Bids efficiently and accurately, in particular, the Price Schedule, for which a form is provided in Section IV. In addition, the Schedule of Requirements, together with the Price Schedule, should serve as a basis in the event of quantity variation at the time of award of contract pursuant to ITB 41.

The date or period for delivery should be carefully specified, taking into account (a) the implications of delivery terms stipulated in the Instructions to Bidders pursuant to the *Incoterms* rules (i.e., EXW, or CIF, CIP, FOB, FCA terms—that “delivery” takes place when goods are delivered to the carriers), and (b) the date prescribed herein from which the Purchaser’s delivery obligations start (i.e., notice of award, contract signature, opening or confirmation of the letter of credit).



## 1. List of Goods and Delivery Schedule

[The Purchaser shall fill in this table, with the exception of the column "Bidder's offered delivery date" to be filled by the Bidder.]

Line Item No	Description of Goods	Quantity	Physical unit	Final destination (Project Site) as specified in BDS	Delivery (as per Incoterms) date		
					Earliest delivery date	Latest delivery date	Bidder's offered delivery date [to be provided by the Bidder]
1	Tractor Set, 47hp	1 lot	120 units and implements	Agricultural Mechanization Stations at Pyay, Paukkhaung, Thegone and Paungde Townships, Pyay District and Nattalin Township, Ayeyawaddy District, Bago (West) Region	[insert the number of days following the date of effectiveness the Contract]	[insert the number of days following the date of effectiveness the Contract]	[insert the number of days following the date of effectiveness the Contract]
2	Tractor Set, 68hp	1 lot	100 units and implements				
3	Combine Harvester Set	1 lot	25 units				
4	Mini Excavator	5 units	5 units				
5	Workshop Tools	1 lot	5 sets				
	Spare Parts	1 lot	1 lot	Base Store Depot (A) of Agricultural Mechanization Station, Kyaik Kalawt, Mingladone Township, Northern District, Yangon			

## 2. List of Related Services and Delivery Schedule

[This table shall be filled in by the Purchaser. The required delivery dates of Services should be realistic, and consistent with the required Goods delivery dates (as per Incoterms).]

Item No	Description of Service	Quantity	Physical unit	Place where Services shall be delivered	Final delivery date(s) of Services
1	Product Test participated by AMD engineers in Japan or other manufacturing country borne by the Supplier	1 lot	3 persons for 8 days	Manufacturer's factories	
2	Dispatch of engineer (s) for Quantity Inspection for the Goods with spare parts	1 lot	1 person or more	The Delivery Site at Base Store Depot (A) of Agricultural Mechanization Department, Kyaik Kalawt Mingladone Township, Yangon	
3	Dispatch of engineer(s) for Test-run, Initial Instruction and Final inspection for the Goods without spare parts	1 lot	1 person or more	The Project Sites at Agricultural Mechanization Stations at Pyay, Paukkaung, Thegone and Paungde Townships, Pyay District and Nattalin Township, Thayawaddy District, Bago (West) Region	

## Section VI Schedule of Requirements

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4	Dispatch of engineers for training	1 lot	3 days for tractors 5 days for combine harvesters 2 days for excavators	Agricultural Mechanization Training Center, Meikhtila Township, Meikhtila District, Mandalay Region	
5	Supply of repairing advices and arrangement of spare parts after the warranty period	1 lot	1 qualified engineer, or more, of the agent(s) appointed by the Manufacturer for tractors and combine harvesters	The agent(s) shall be located at Pyay District, Bago (West) Region	

### 3. Technical Specifications

#### Notes on Technical Specifications

The purpose of the Technical Specifications (TS) is to define the technical characteristics of the Goods and Related Services required by the Purchaser. The Purchaser shall prepare the detailed TS by taking into account that:

- The TS constitute the benchmarks against which the Purchaser will verify the technical responsiveness of Bids and subsequently evaluate the Bids. Therefore, well-defined TS will facilitate preparation of responsive Bids by Bidders, as well as examination, evaluation, and comparison of the Bids by the Purchaser.
- The TS shall require that all Goods and materials to be incorporated in the Goods be new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided for otherwise in the contract.
- The TS shall make use of best practices. Samples of specifications from successful similar procurements in the same country or sector may provide a sound basis for drafting the TS.
- The use of metric units is encouraged.
- Standardizing technical specifications may be advantageous, depending on the complexity of the Goods and the repetitiveness of the type of procurement. The TS should be broad enough to avoid restrictions on workmanship, materials, and equipment commonly used in manufacturing similar kinds of goods.
- Standards for equipment, materials, and workmanship specified in the Bidding Documents shall not be restrictive. Recognized international standards should be specified as much as possible. Reference to brand names, catalogue numbers, or other details that limit any materials or items to a specific manufacturer should be avoided as far as possible. Where unavoidable, such item description should always be followed by the words “or substantially equivalent.” When other particular standards or codes of practice are referred to in the TS, whether from the Borrower’s or from other eligible source countries, a statement should follow other authoritative standards that ensure at least a substantially equal quality, then the standards mentioned in the TS will also be acceptable.
- The TS shall be fully descriptive of the requirements in respect of, but not limited to, the following:
  - (a) Standards of materials and workmanship required for the production and manufacturing of the Goods.

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Section VI. Schedule of Requirements

- (b) Detailed tests required (type and number).
- (c) Other additional work and/or Related Services required to achieve full delivery.
- (d) Detailed activities to be performed by the Supplier, and participation of the Purchaser thereon.
- (e) List of detailed functional guarantees covered by the Warranty and the specification of the liquidated damages to be applied in the event that such guarantees are not met.
- The TS shall specify all essential technical and performance characteristics and requirements, including guaranteed or acceptable maximum or minimum values, as appropriate. Whenever necessary, the Purchaser shall include an additional ad-hoc Bidding Form (to be an Attachment to the Letter of Bid), where the Bidder shall provide detailed information on such technical performance characteristics in respect to the corresponding acceptable or guaranteed values.

When the Purchaser requests that the Bidder provides in its Bid a part or all of the TS, technical schedules, or other technical information, the Purchaser shall specify in detail the nature and extent of the required information and the manner in which it has to be presented by the Bidder in its Bid.

***“Summary of Technical Specifications. The Goods and Related Services shall comply with following Technical Specifications and Standards:***

<i>Item No</i>	<i>Name of Goods or Related Service</i>	<i>Technical Specifications and Standards</i>
1.	Tractor Set, 47hp	Net output power 47hp, equipped with plough type disc harrow, rotavator and front dozer
2.	Tractor Set, 68hp	Net output power 68hp, equipped with disc plough, plough type disc harrow, offset harrow, rotavator and front dozer
3.	Combine Harvester Set	Net output power 68hp and semi-trailer tractor
4.	Mini Excavator	4.7 ton, net output power 39hp, bucket 0.16 m <sup>3</sup>
5.	Workshop Tool	Engine driven air compressor, Hydraulic floor jack and Engineering tool set

## 4. Inspections and Tests

The following inspections and tests shall be performed:

<b>Inspection and Test</b>	<b>Description</b>	<b>Place</b>
1. Product Test	Tested by the Manufacturer(s) for assembled machineries	Manufacturers' factories
2. Pre-shipping Inspection	Inspected by the third party	Shipping warehouse(s) in the exporting countries of the final products
3. Quantity Inspection	Inspected by the Purchaser and the Consultant	The Delivery Site at Base Store Depot (A) of Agricultural Mechanization Department, Kyaik Kalawt Mingladone Township, Yangon
4. Test-run, Initial Instruction and Final Inspection	Inspected by the Purchaser and the Consultant	The Project Sites at Agricultural Mechanization Stations at Pyay, Paukkhaung, Thegone and Paungde Townships, Pyay District and Nattalin Township, Thayawaddy District, Bago (West) Region

## Section VIII. Particular Conditions (PC)

### Particular Conditions (PC)

GC 1.1(l)	The Project Sites/final destinations are: Agricultural Mechanization Stations at Pyay, Paukkhaung, Thegone and Paungde Townships, Pyay District and Nattalin Township, Thayawaddy District, Bago (West) Region.
GC 1.1(m)	The Purchaser is: Irrigation Department, Ministry of Agriculture and Irrigation. The Goods shall be used and managed by Agricultural Mechanization Department.
GC 1.1(n)	The Purchaser's Country is: Republic of the Union of Myanmar.
GC 5.1	The language shall be: English.
GC 11.1	<p>Details of Shipping and other Documents to be furnished by the Supplier are a negotiable bill of lading, a non-negotiable sea way bill, (an airway bill, a railway consignment note, a road consignment note, if necessary), insurance certificate, Manufacturer's product inspection reports, Supplier's shipping lists, pre-shipping inspection certificate issued by nominated inspection agency, Manufacturer's or Supplier's warranty certificate and necessary technical documents.</p> <p>The above documents shall be received by the Purchaser before arrival of the Goods and, if not received, the Supplier will be responsible for any consequent expenses.</p>
GC 14.1	<p>The method and conditions of payment to be made to the Supplier under this Contract shall be as follows:</p> <p style="text-align: center;"><b>Payment for the Goods and Related Services supplied from outside Purchaser's Country:</b></p> <p>Payment of foreign currency portion shall be made in [<i>insert foreign currency of the Contract Price</i>] in the following manner:</p> <p>(i) <b>Advance Payment:</b> Ten (10) percent of the Contract Price shall be paid, upon signing of the Contract, within forty-five (45) days after receipt of invoice and a bank guarantee for the equivalent amount valid until the Goods and Related Services are delivered and in the form provided in the Bidding Documents or another form acceptable to the Purchaser.</p> <p>(ii) <b>On Shipment:</b> Eighty (80) percent of the Contract Price shall be paid through an irrevocable letter of credit opened in favor</p>

	<p>of the Supplier against the documents specified in the letter of credit.</p> <p>(iii) <b>On Acceptance:</b> Ten (10) percent of the Contract Price shall be paid within forty-five (45) days after receipt of invoice and a certificate from the Purchaser declaring that the Goods and Related Services have been delivered and accepted.</p> <p><b>Payment for the Goods and Related Services supplied from the Purchaser's Country:</b></p> <p>Payment for local currency portion shall be made in Myanmar Kyat (MMK) in the following manner:</p> <p>(i) <b>Advance Payment:</b> Ten (10) percent of the Contract Price shall be paid, upon signing of the Contract, within forty-five (45) days after receipt of invoice and a bank guarantee for the equivalent amount valid until the Goods and Related Services are delivered and in the form provided in the Bidding Documents or another form acceptable to the Purchaser.</p> <p>(ii) <b>On Delivery:</b> Eighty (80) percent of the Contract Price shall be paid within forty-five (45) days after receipt of invoice and the documents specified in GC Clause 11.</p> <p>(iii) <b>On Acceptance:</b> Ten (10) percent of the Contract Price shall be paid within forty-five (45) days after receipt of invoice and a certificate from the Purchaser declaring that the Goods and Related Services have been delivered and accepted.</p>
<b>GC 16.1</b>	<p>A Performance Security shall be required.</p> <p>The amount of the Performance Security shall be: ten percent (10%) of the contract price.</p>
<b>GC 22.1</b>	<p>The insurance coverage shall be as specified in the Incoterms.</p>
<b>GC 23.1</b>	<p>Responsibility for transportation shall be as follows:</p> <p>The Supplier is required under the Contract to transport the Goods to the Delivery Site at specified Warehouse in Yangon with transport insurance. The related costs shall be included in the Contract Price.</p> <p>The Purchaser shall be responsible for custom clearance, store at the Delivery Site and transport from the Delivery Site to the Project Sites within the Purchaser's Country, defined as the Project Site, transport to such place of destination in the Purchaser's Country.</p>



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<b>GC 24.1</b>	The inspections and tests shall be: 1) product tests by the Manufacturers for tractors, combine harvesters and excavators, 2) pre-shipping inspection by the third parties for all goods, 3) quantity inspection for all Goods including spare parts and 4) final inspection for all Goods excluding spare parts.
<b>GC 24.2</b>	The inspections and tests shall be conducted at: 1) at the Manufacturer's Factory(ies) for product tests, 2) at shipper's warehouse(s) for pre-shipping inspection, and 3) at the Delivery Site for quantity inspection and 4) at the Project Sites for final inspection.
<b>GC 25.1</b>	The liquidated damage shall be: zero point five percent (0.5 %) per week.
<b>GC 25.1</b>	The maximum amount of liquidated damages shall be: ten percent (10 %) of the Contract Price.
<b>GC 26.3</b>	The period of validity of the warranty shall be: three hundred sixty five (365) days.
<b>GC 26.3</b>	For the purposes of the warranty, the places of final destinations shall be: at Agricultural Mechanization Stations at Pyay, Paukkhaung, Thegone and Paungde Townships, Pyay District and Nattalin Township, Thayawaddy District, Bago (West) Region

# APPENDIX-VII

## FARM LAND CONSOLIDATION

# APPENDIX VII: FARM LAND CONSOLIDATION

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## VII.1 List of the Beneficiary Farmers for Land Consolidation Project

## List of the Beneficiary Farmers for Land Consolidation Project (1/2)

Sr No.	Village Tract	Village	Name of Householder	Farm land area (Acres)					
				(1)	(2)	(3)	(4)	(5)	Total
1	Aung Zabu	Aung Zabu		0.38	3.97				4.35
2	Aung Zabu	Aung Zabu		2.71					2.71
3	Aung Zabu	Aung Zabu		2.10	1.02				3.12
4	Aung Zabu	Aung Zabu		3.35	2.09				5.44
5	Aung Zabu	Aung Zabu		1.29					1.29
6	Aung Zabu	Aung Zabu		2.10					2.10
7	Aung Zabu	Aung Zabu		1.67					1.67
8	Aung Zabu	Aung Zabu		1.35	1.13				2.48
9	Aung Zabu	Aung Zabu		2.12					2.12
10	Aung Zabu	Aung Zabu		0.40					0.40
11	Aung Zabu	Aung Zabu		1.00					1.00
12	Aung Zabu	Aung Zabu		1.00	1.00				2.00
13	Aung Zabu	Aung Zabu		0.78	1.53				2.31
14	Aung Zabu	Aung Zabu		3.38	2.17				5.55
15	Aung Zabu	Aung Zabu		0.58	0.90				1.48
16	Aung Zabu	Aung Zabu		11.19	2.26				13.45
17	Aung Zabu	Aung Zabu		0.32					0.32
18	Aung Zabu	Aung Zabu		1.53					1.53
19	Aung Zabu	Aung Zabu		10.54					10.54
20	Aung Zabu	Aung Zabu		3.92					3.92
21	Aung Zabu	Aung Zabu		1.17					1.17
22	Aung Zabu	Aung Zabu		2.39					2.39
23	Aung Zabu	Aung Zabu		2.70					2.70
24	Aung Zabu	Aung Zabu		0.74					0.74
25	Aymla	Aymla		0.12					0.12
26	Aymla	Aymla		0.73					0.73
27	Aymla	Aymla		2.95	1.05				4.00
28	Aymla	Aymla		1.00					1.00
29	Aymla	Aymla		1.02	2.92	1.96			5.90
30	Aymla	Aymla		0.90					0.90
31	Aymla	Aymla		1.13	0.40				1.53
32	Aymla	Aymla		2.05					2.05
33	Aymla	Aymla		0.58					0.58
34	Aymla	Aymla		0.05					0.05
35	Aymla	Aymla		1.12					1.12
36	Aymla	Aymla		3.15	1.73				4.88
37	Aymla	Aymla		1.46					1.46
38	Aymla	Aymla		1.20					1.20
39	Aymla	Aymla		0.79					0.79
40	Aymla	Aymla		1.00	1.72				2.72
41	Aymla	Aymla		2.75					2.75
42	Aymla	Aymla		0.75					0.75
43	Aymla	Aymla		1.03					1.03
44	Aymla	Aymla		1.96					1.96
45	Aymla	Aymla		1.01	0.49				1.50
46	Aymla	Aymla		0.45					0.45
47	Aymla	Aymla		2.46					2.46
48	Aymla	Aymla		0.66	0.37				1.03
49	Aymla	Aymla		1.00	1.25				2.25
50	Aymla	Aymla		3.47	1.75	0.67	1.28		7.17
51	Aymla	Aymla		0.03					0.03
52	Aymla	Aymla		1.57					1.57
53	Aymla	Aymla		0.72	0.68				1.40
54	Aymla	Aymla		3.26	0.07				3.33
55	Aymla	Aymla		3.75					3.75
56	Aymla	Aymla		0.71					0.71
57	Kan Oo (pyin ma nar)	Kan Oo		0.52					0.52
58	Kan Oo (pyin ma nar)	Kan Oo		5.99	1.14				7.13
59	Kan Oo (pyin ma nar)	Kan Oo		1.43					1.43
60	Kan Oo (pyin ma nar)	Kan Oo		1.47					1.47
61	Kan Oo (pyin ma nar)	Kan Oo		1.90					1.90
62	Kan Oo (pyin ma nar)	Kan Oo		0.52					0.52
63	Kan Oo (pyin ma nar)	Kan Oo		1.24					1.24
64	Kan Oo (pyin ma nar)	Kan Oo		1.88					1.88
65	Kan Oo (pyin ma nar)	Kan Oo		0.81					0.81
66	Te Gyi Gone	Gone Min Ein		3.76					3.76
67	Te Gyi Gone	Gone Min Ein		1.00					1.00
68	Te Gyi Gone	Gone Min Ein		2.05					2.05
69	Te Gyi Gone	Gone Min Ein		1.00					1.00
70	Te Gyi Gone	Gone Min Ein		5.56					5.56
71	Te Gyi Gone	Gone Min Ein		0.61					0.61

**List of the Beneficiary Farmers for Land Consolidation Project (2/2)**

Sr. No.	Village Tract	Village	Name of Householder	Farm land area (Acres)					
				(1)	(2)	(3)	(4)	(5)	Total
72	Te Gyi Gona	Gona Min Ean		1.87					1.87
73	Te Gyi Gona	Gona Min Ean		7.76					7.76
74	Te Gyi Gona	Gona Min Ean		2.06					2.06
75	Te Gyi Gona	Gona Min Ean		0.46					0.46
76	Te Gyi Gona	Gona Min Ean		1.87					1.87
77	Te Gyi Gona	Gona Min Ean		2.00					2.00
78	Te Gyi Gona	Gona Min Ean		2.38					2.38
79	Te Gyi Gona	Gona Min Ean		0.49					0.49
80	Te Gyi Gona	Gona Min Ean		1.09					1.09
81	Te Gyi Gona	Gona Min Ean		1.87					1.87
82	Te Gyi Gona	Gona Min Ean		0.40					0.40
83	Te Gyi Gona	Gona Min Ean		0.32					0.32
84	Te Gyi Gona	Gona Min Ean		1.24					1.24
85	Te Gyi Gona	Gona Min Ean		1.00					1.00
86	Te Gyi Gona	Gona Min Ean		0.78					0.78
87	Te Gyi Gona	Gona Min Ean		0.80					0.80
88	Te Gyi Gona	Gona Min Ean		12.16					12.16
89	Te Gyi Gona	Gona Min Ean		1.10					1.10
90	Te Gyi Gona	Gona Min Ean		2.61					2.61
91	Te Gyi Gona	Gona Min Ean		3.60					3.60
92	Te Gyi Gona	Gona Min Ean		0.99					0.99
93	Te Gyi Gona	Gona Min Ean		1.02					1.02
94	Te Gyi Gona	Gona Min Ean		2.27					2.27
95	Te Gyi Gona	Gona Min Ean		3.86					3.86
96	Te Gyi Gona	Gona Min Ean		0.80					0.80
97	Te Gyi Gona	Gona Min Ean		1.17					1.17
98	Te Gyi Gona	Gona Min Ean		3.15					3.15
99	Te Gyi Gona	Gona Min Ean		2.69					2.69
100	Te Gyi Gona	Gona Min Ean		0.80					0.80
101	Te Gyi Gona	Gona Min Ean		2.06					2.06
102	Te Gyi Gona	Gona Min Ean		3.50					3.50
103	Te Gyi Gona	Gona Min Ean		2.24					2.24
104	Te Gyi Gona	Gona Min Ean		0.73					0.73
105	Te Gyi Gona	Gona Min Ean		0.99					0.99
106	Te Gyi Gona	Gona Min Ean		2.74					2.74
107	Te Gyi Gona	Gona Min Ean		0.92					0.92
108	Te Gyi Gona	Gona Min Ean		1.84					1.84
109	Te Gyi Gona	Gona Min Ean		2.94					2.94
110	Te Gyi Gona	Gona Min Ean		1.09					1.09
111	Te Gyi Gona	Gona Min Ean		5.85					5.85
112	Te Gyi Gona	Gona Min Ean		1.68					1.68
113	Te Gyi Gona	Gona Min Ean		11.48					11.48
114	Te Gyi Gona	Gona Min Ean		0.30					0.30
115	Te Gyi Gona	Gona Min Ean		1.06					1.06
116	Te Gyi Gona	Gona Min Ean		0.86					0.86
117	Te Gyi Gona	Gona Min Ean		1.36					1.36
118	Te Gyi Gona	Gona Min Ean		0.95					0.95
119	Te Gyi Gona	Shar Taw		1.59					1.59
120	Te Gyi Gona	Shar Taw		2.62					2.62
121	Te Gyi Gona	Shar Taw		0.30	0.94				1.24
122	Te Gyi Gona	Shar Taw		1.04					1.04
123	Te Gyi Gona	Shar Taw		0.59					0.59
124	Te Gyi Gona	Shar Taw		0.78					0.78
125	Te Gyi Gona	Shar Taw		1.81	1.39				3.20
126	Te Gyi Gona	Shar Taw		1.27	1.00				2.27
127	Te Gyi Gona	Shar Taw		1.00					1.00
128	Te Gyi Gona	Shar Taw		0.52					0.52
129	Te Gyi Gona	Shar Taw		0.91					0.91
130	Te Gyi Gona	Shar Taw		3.14					3.14
131	Te Gyi Gona	Shar Taw		2.01	0.08				2.09
132	Te Gyi Gona	Shar Taw		5.66					5.66
133	Te Gyi Gona	Shar Taw		1.00					1.00
134	Te Gyi Gona	Shar Taw		1.48					1.48
135	Te Gyi Gona	Te Gyi Gona		2.84					2.84
136	Te Gyi Gona	Te Gyi Gona		0.48					0.48
137	Te Gyi Gona	Te Gyi Gona		0.97					0.97
138	Te Gyi Gona	Te Gyi Gona		1.82					1.82
<b>Total Farmland in Land Consolidation Project.</b>				<b>272.51</b>	<b>33.05</b>	<b>2.63</b>	<b>1.28</b>	<b>0</b>	<b>309.47</b>

## VII.2 Record of 1<sup>st</sup> Farmer Meeting

### Explanation of Model Farmland Consolidation

20<sup>th</sup> July 2013

#### About construction period

**Question.1)** Is there any plan to inform the farmer when the construction of farm land consolidation will start exactly? If government can inform farmer about that in advance, it will be very good for us because we can decide/ adjust the time when we should cultivate the crop or not.

**Answer.1)** We will inform all the concerned farmers the construction period after we fixed it.

#### About farm land area which Nay Pyi Taw city bought before

**Comment from farmer.1)** I would like to request you regarding with the land area which was bought by the Government for Nay Pyi Taw Council road construction. As your explanation, these farm lands will be used for construction of farm road, irrigation and drainage canal, but it should be given back to the original owners, who sold out those to the Government. Owning of that area is just by around 30 farmers but those which will be used for 138 farmers is unfair.

**Explanation.1)** Government just bought and paid for those lands, not taking by force. And now, these land will be given back to implement the farmland consolidation project. So, please do not think only for yourself but just think for other farmers. And also, you better discuss with the rest farmers also who used to own farmlands within the area which was bought by Government. You better try to know what their decisions are.

**Comment from farmer.2)** Yes, Government bought but they paid only 350,000 Kyat per acre which is not the reasonable and the prevailing price at that time.

**Comment from farmer.3)** I am also one of the farmers who used to own the farmland within that area. For me, I just sold out those farmlands by my own decision. I just thought that it was donation for road construction which can make our village develop though I know the price given by the Government was not reasonable. So now, the same condition, those lands were given back to implement the Farmland Consolidation Project a kind of developing plan. I don't want those lands back. I just want to say those land should be considered just only for the project under an arrangement of related Government Departments.

**Explanation.2)** That is why I recommend you to form a farmer organization. Then, those kinds of things can be solved within your organization. For every kind of problems, you have to obey what the most people want to be. Nobody can consider only for themselves, they must follow and pay respect to what the most people decide.

**Explanation.3)** As cooperative department explained to you, JICA side also has been assisting to form a farmer organization. Again, we strongly would like to recommend for forming a farmer organization first. As we explained you that organization will be legal entity so you can own and manage by your arrangement for the total area of the project and also you can request for the assistance from the Government Departments if necessary. Anyway, we would like to remind two things to you, 1) kindly accept that Nay Pyi Taw council will give those lands to the project, not for individual farmers. 2) JICA can continue preparation for this project by the reason that total area of farm road and canal construction is smaller than the area of Nay Pyi Taw council road construction. We can say Nay Pyi Taw council gives that land to the organization to utilize for road and canal construction. If those lands are taken back by individual farmers, every farmer will have to lose few percentage of their farmland.

### VII.3 Record of 2nd Farmer Meeting

#### Establishment of Farmer organization

1<sup>st</sup> September 2013

#### Objective of establishment of farmer organization

**Question.1)** What are the benefits for being a member of farmer organization?

**Answer.1)** What we can tell exactly now is you all will be considered to reduce the difficulties of agriculture sector by being a member of farmer organization. Our government wants this project to be a model of land consolidation projects in Myanmar. Because our government has been planning to implement land consolidation activities country-wise but we have not enough experience up to now. That is why JICA was requested to find perfect ways starting from the time before project (preparing stage) to the time after project (maintaining stage for sustainability).

According to those explained conditions, the following step is coming out; concerned government departments are also deeply collaborating with JICA Team to gain the objectives. As one best way we have find out is; **preparing, implementing and maintaining activities of the Project are more effective with the management of farmer organization participating by all the farmers of the project.**

So, forming farmer organization becomes the most important activity of our project and we all believe that it will be the strongest stand for project's success. A management committee which will be supervising body of farmer organization is also tried to form by volunteer farmers from each and every village benefited under the project. After forming a management committee by that kind of persons, management committee will consider for a better condition of all farmers, the whole farmer organization.

And also, **by representing farmer organization, management committee is able to request supports from concerned government departments if necessary.** Concerned departments will not hesitate to take respond for what you request because, as I explained, this project is supported to be a model of farmland consolidation projects in Myanmar. I hope you can now have emerging changes and opportunities for being a member of farmer organization.

**Question.2)** What are responsibilities of MC?

**Answer.2)** Firstly, for current condition, management committee has to prepare necessary and important tasks for both of forming and registration of farmer organization and implementing land consolidation works by linking with Cooperative department. JICA Team will mainly do assistance for farmer organization and concerned departments will be conditional supporters. Secondly, after Project period, may be 4 or 5 year later, I cannot tell exactly what management committee has to supervise at that period, it may also be changed year by year since it depends on the objectives set by general assembly held at least once a year.

#### Support for farmer organization

**Question.3)** How government departments will help and support the farmer organization?

**Answer.3)** It will depend on what you request and they will respond as necessary. Management committee can request to related expertise department through cooperative department of Zabu Thiri Township office.

**Question.4)** What are limitations of JICA for the post of management committee member?

**Answer.4)** There is no limitation from JICA if other villagers agreed with the selected person(s) of their village but selected person should be a beneficiary of this project and actively participate in

non-profit activities.

**Question.5)** Are Rules and Regulations of farmer organization already prepared?

**Answer.5)** As I explained, that should be done by the management committee. Now, JICA Team has been checking a draft rule and regulation based on a reference which is coop department commonly used in the case of establishing new farmer organizations under their entire arrangement. This rule and regulation should have been modified by inputting some items for respective sectors by discussing with concerned departments.

After that, farmer organization will use it for reference of management committee. If there are some comments from farmer organization member(s), management committee has to check and edit if necessary. After checking within farmer organization, management committee has to set it up and call a meeting to get approval from concerned departments.

**Answer.6)** Under cooperative department, this is the first organization established for farmland consolidation project. Also this organization will be recorded as the first organization different from others established for the purpose of developing small and medium industry/enterprise by the government. I believe farmer organization and management committee will successfully be established after this event and as soon as after this, I will apply to get some government loan for this organization. According to the prioritization of Ministry of Agriculture and Irrigation and hard efforts of JICA Team, we can say this is one of the national level projects and I believe your organization also will be a good model for other organizations. If your organization can reach to the target as we want, I will arrange regular study tour for other organizations under cooperative department to study this farmer organization in Nay Pyi Taw.



VII.4 Population Census and Property Ownership Survey

No	Village		Name of householder	Status of family					Land					Livelihood							Awareness		
	Village Tract	Village		Sex of holder (M or F)	Widow holder? (Y/N)	Ethnic name	Age of holder	Telephone number	Educational status of householder	Number of family members	Number of male family member	Number of female family member	Area of farmland under project (acres)	Land tenure, have title deed? (Y/N)	Area to be lost due to installation of construction (acres)	Main income source	1st Main cultivated crop	2nd Main cultivated crop	3rd Main cultivated crop	How many times of paddy cultivation/year		Average yield of paddy (basket/acre)	Annual household cash income (Kyats)
Row				B				C				D	E	F	G	H	I	J	K	L	M	N	
1	Ayeth	Ayeth		F	N	Bamar			5	5	0	0.12	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	35	1,200,000	Y	
2	Ayeth	Ayeth		F	Y	Bamar			4	8	3	0.13	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	60	100,000	Y	
3	Ayeth	Ayeth		F	Y	Bamar			4	2	0	4.00	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	70	1,200,000	Y	
4	Ayeth	Ayeth		F	N	Bamar			4	3	1	1.00	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,500,000	Y	
5	Ayeth	Ayeth		F	N	Bamar			4	8	4	5.80	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	2,000,000	Y	
6	Ayeth	Ayeth		F	N	Bamar			4	3	3	0.80	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	75	1,000,000	Y	
7	Ayeth	Ayeth		F	N	Bamar			8	1	0	1.53	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	90	450,000	Y	
8	Ayeth	Ayeth		F	N	Bamar			4	1	0	2.05	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,000,000	Y	
9	Ayeth	Ayeth		Y	N	Bamar			10	5	1	6.38	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	900,000	Y	
10	Ayeth	Ayeth		F	N	Bamar			4	3	2	0.05	Y		Cottage Worker	Monsoon Paddy	Black Gram	-	1	60	1,200,000	Y	
11	Ayeth	Ayeth		M	N	Bamar			Monastery	5	1	4	1.12	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,780,000	Y
12	Ayeth	Ayeth		M	N	Bamar			4	8	2	4.88	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	60	1,500,000	Y	
13	Ayeth	Ayeth		M	N	Bamar			4	2	1	1.88	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	10	1,000,000	Y	
14	Ayeth	Ayeth		M	Y	Bamar			4	2	0	1.20	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	60	1,000,000	Y	
15	Ayeth	Ayeth		M	N	Bamar			17	5	1	0.75	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	10	1,200,000	Y	
16	Ayeth	Ayeth		M	N	Bamar			4	5	1	2.71	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,700,000	Y	
17	Ayeth	Ayeth		M	N	Bamar			5	2	1	2.75	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	85	1,200,000	Y	
18	Ayeth	Ayeth		M	N	Bamar			6	7	4	0.95	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,300,000	Y	
19	Ayeth	Ayeth		M	N	Bamar			7	7	5	1.03	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	60	4,600,000	Y	
20	Ayeth	Ayeth		M	N	Bamar			8	5	3	1.98	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	3,500,000	Y	
21	Ayeth	Ayeth		M	N	Bamar			5	3	4	1.50	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	60	1,700,000	Y	
22	Ayeth	Ayeth		M	N	Bamar			No	7	3	4	0.65	Y		Cottage Worker	Monsoon Paddy	Black Gram	-	1	70	5,072,998	Y
23	Ayeth	Ayeth		M	N	Bamar			6	4	1	2.45	Y		Agriculture	Monsoon Paddy	Black Gram	Sesame	1	80	1,500,000	Y	
24	Ayeth	Ayeth		M	N	Bamar			7	4	2	1.03	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	90	1,300,000	Y	
25	Ayeth	Ayeth		M	N	Bamar			5	8	2	2.25	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	100	1,500,000	Y	
26	Ayeth	Ayeth		M	N	Bamar			8	5	4	7.17	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	85	2,100,000	Y	
27	Ayeth	Ayeth		M	N	Bamar			Monastery	3	1	4	0.03	Y		Casual Labor	Monsoon Paddy	Black Gram	-	1	75	10,005,000	Y
28	Ayeth	Ayeth		M	N	Bamar			7	3	0	1.57	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	85	1,200,000	Y	
29	Ayeth	Ayeth		M	N	Bamar			4	8	3	1.40	Y		Agriculture	Monsoon Paddy	Black Gram	Sesame	1	80	4,000,000	N	
30	Ayeth	Ayeth		M	N	Bamar			4	4	2	3.33	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	90	3,000,000	Y	
31	Ayeth	Ayeth		M	N	Bamar			8	8	1	2.75	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	2,000,000	Y	
32	Ayeth	Ayeth		M	N	Bamar			6	4	3	6.71	Y		Carpenter	Monsoon Paddy	Black Gram	-	1	85	1,100,000	Y	

No	Village		Status of family								Land			Livelihood							Awareness		
	Village Tract	Village	Name of householder	Sex of holder (M or F)	Wider holder ? (Y/N)	Ethnic name	Age of holder	Telephone number	Educational status of householder	Number of family members	Number of male family member	Number of female family member	Area of farmland under project (acre)	Land tenure, has title deed? (Y/N)	Area to be lost due to road/canal construction (acre)	Main income source	1st Main cultivated crop	2nd Main cultivated crop	3rd Main cultivated crop	How many times of paddy cultivation/year		Average yield of paddy (basket/acre)	Annual household cash income (Kyats)
Note				B					C			D	E	F	G	H	I	J	K	L	M	N	
33	Ta Oyi Gone	Shar Taw		F	N	Bamar			6	3	1	2	1.59	Y		Casual Labor	Monsoon Paddy	Black Gram	-	1	70	1,300,000	Y
34	Ta Oyi Gone	Shar Taw		F	N	Bamar			9	6	4	4	2.52	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	2,000,000	Y
35	Ta Oyi Gone	Shar Taw		F	Y	Bamar			5	4	3	1	1.24	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,500,000	Y
36	Ta Oyi Gone	Shar Taw		F	Y	Bamar			4	4	3	2	1.94	Y		Casual Labor	Monsoon Paddy	Black Gram	-	1	80	800,000	Y
37	Ta Oyi Gone	Shar Taw		F	N	Bamar			6	6	2	4	0.54	Y		Agriculture	Monsoon Paddy	Black Gram	-	2	70	1,000,000	Y
38	Ta Oyi Gone	Shar Taw		F	N	Bamar			3	2	0	2	0.78	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	50	1,000,000	Y
39	Ta Oyi Gone	Shar Taw		M	N	Bamar			6	5	1	4	3.29	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	2,000,000	Y
40	Ta Oyi Gone	Shar Taw		M	N	Bamar			6	3	1	2	2.23	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,500,000	Y
41	Ta Oyi Gone	Shar Taw		M	N	Bamar			7	3	1	2	1.00	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,500,000	Y
42	Ta Oyi Gone	Shar Taw		M	N	Bamar			4	7	4	3	0.52	Y		Agriculture	Monsoon Paddy	Black Gram	-	3	70	1,200,000	Y
43	Ta Oyi Gone	Shar Taw		M	N	Bamar			4	4	2	2	0.81	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,000,000	Y
44	Ta Oyi Gone	Shar Taw		M	N	Bamar			8	4	0	1	3.14	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,100,000	Y
45	Ta Oyi Gone	Shar Taw		M	N	Bamar			4	3	2	1	0.89	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	60	1,200,000	Y
46	Ta Oyi Gone	Shar Taw		M	N	Bamar			4	5	2	2	5.66	Y		Agriculture	Monsoon Paddy	Black Gram	-	4	70	2,500,000	Y
47	Ta Oyi Gone	Shar Taw		M	N	Bamar			4	3	1	2	1.60	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,200,000	Y
48	Ta Oyi Gone	Shar Taw		M	N	Bamar			7	8	2	6	1.48	Y		Vendor	Monsoon Paddy	Black Gram	-	1	70	1,200,000	Y
49	Ta Oyi Gone	Ta Oyi Gone		F	N	Bamar			4	1	0	1	0.34	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	2,000,000	Y
50	Ta Oyi Gone	Ta Oyi Gone		M	N	Bamar			5	3	2	1	0.46	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,500,000	Y
51	Ta Oyi Gone	Ta Oyi Gone		M	N	Bamar			7	3	4	1	0.37	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	60	800,000	Y
52	Ta Oyi Gone	Ta Oyi Gone		M	N	Bamar			10	3	2	1	1.60	Y		Grocery Shop	Summer Paddy	Monsoon Paddy	Black Gram	2	60	14,000,000	Y
53	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			4	5	0	3	3.76	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	2,000,000	Y
54	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			8	7	4	3	1.00	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,000,000	Y
55	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			6	1	1	0	2.05	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	700,000	Y
56	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			8	5	2	3	1.00	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,000,000	Y
57	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			4	5	2	2	5.56	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	2,400,000	Y
58	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			4	3	2	1	0.61	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,000,000	Y
59	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			5	2	0	2	1.87	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,200,000	Y
60	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			4	5	2	3	7.19	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	3,000,000	Y
61	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			5	4	1	3	2.06	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	520,000	Y
62	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			4	4	0	4	4.46	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	800,000	Y
63	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			5	5	2	2	1.87	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,200,000	Y
64	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			Monthly	6	3	2	2.00	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	2,200,000	Y
65	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar			Monthly	4	2	2	2.38	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	2,300,000	Y

No	Village		Status of family							Land			Livelihood							Awareness		
	Village Tract	Village	Name of householder	Sex of Hholder (M or F)	Widow Hholder ? (Y/N)	Ethnic name	Age of Hholder	Telephone number	Educational status of householder	Number of family members	Number of male family member	Number of female family member	Area of farmland under project (acre)	Land tenure, have title deed? (Y/N)	Area to be lost due to road/canal construction (acre)	Main income source	1st Main cultivated crop	2nd Main cultivated crop	3rd Main cultivated crop	How many times of paddy culture/ha/year	Average yield of paddy (basket/acre)	Annual household cash income (Kyats)
Notes				B				C				D	E	F	G	H	I	J	K	L	M	N
68	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar		8	5	2	3	0.48	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	700,000	Y
69	Ta Oyi Gone	Gone Ma Ein		A	Y	Bamar		4	3	1	2	1.09	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	2,000,000	Y
68	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar		8	2	2	1	1.87	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	75	800,000	Y
68	Ta Oyi Gone	Gone Ma Ein		F	Y	Bamar		4	2	1	1	0.40	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	700,000	Y
70	Ta Oyi Gone	Gone Ma Ein		F	N	Bamar		8	6	3	3	0.07	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,000,000	Y
71	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		Monstrty	5	3	2	1.24	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	75	800,000	Y
72	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		10	9	5	4	1.00	Y		Cottage Worker	Monsoon Paddy	Black Gram	-	1	100	3,519,700	Y
73	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		4	4	3	1	0.78	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,500,000	Y
74	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		4	2	1	2	0.80	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	800,000	Y
75	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		Monstrty	6	2	4	12.16	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	90	4,850,000	Y
76	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		8	4	2	2	1.18	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	2,400,000	Y
77	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		2	3	2	1	2.61	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,100,000	Y
78	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		10	5	2	3	3.50	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,800,000	Y
79	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		8	6	3	4	0.96	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,200,000	Y
80	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		8	4	2	2	1.02	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	2,400,000	Y
81	Ta Oyi Gone	Gone Ma Ein		M	Y	Bamar		8	1	1	0	2.27	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,200,000	Y
82	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		8	4	3	1	3.88	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	1,500,000	Y
83	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		6	4	2	2	0.80	Y		Agriculture	Sesami	Black Gram	-	0	-	1,200,000	Y
84	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		6	4	2	2	1.17	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	75	500,000	Y
85	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		10	6	2	4	5.15	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	3,600,000	Y
86	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		4	4	3	1	2.89	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,641,000	Y
87	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		8	2	1	1	0.80	Y		Cottage Worker	Monsoon Paddy	Black Gram	-	1	75	1,705,000	Y
88	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		8	6	4	2	2.06	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	712,000	Y
89	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		7	3	2	1	3.50	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	75	1,300,000	Y
90	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		4	5	4	2	2.24	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	85	1,800,000	Y
91	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		4	5	3	2	0.73	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	900,000	Y
92	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		8	4	1	3	0.89	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	800,000	Y
93	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		7	8	5	3	2.74	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	75	1,914,500	Y
94	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		5	3	2	3	0.80	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	86	1,200,000	Y
95	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		6	4	2	2	1.84	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,500,000	Y
96	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		Graduate	4	3	1	2.94	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	2,500,000	Y
97	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		10	1	1	0	1.09	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	700,000	Y
98	Ta Oyi Gone	Gone Ma Ein		M	N	Bamar		10	8	3	5	5.45	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	95	3,780,000	Y

No	Village		Status of family						Land					Livelihood						Awareness			
	Village Tract	Village	Name of householder	Sex of holder (M or F)	Widow holder ? (Y/N)	Ethnic name	Age of holder	Telephone number	Educational status of householder	Number of family members	Number of male family member	Number of female family member	Area of farmland under project (acre)	Land tenure, have title deed? (Y/N)	Area to be lost due to road/canal or constructed (acre)	Main income source	1st Main cultivated crop	2nd Main cultivated crop	3rd Main cultivated crop	How many times of paddy cultivation/year	Average yield of paddy (basket/acre)	Annual household cash income (Kyats)	Aware about the Project ? (Y/N)
Notes				B					C			D	E	F	G	H	I	J	K	L	M	N	
99	Ta Gy Gone	Gone Min Ein		M	N	Bamar			8	5	3	1.68	Y		Farm labor	Monsoon Paddy	Black Gram	-	1	80	1,721,000	Y	
100	Ta Gy Gone	Gone Min Ein		M	Y	Bamar			8	3	7	11.49	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	3,556,000	Y	
101	Ta Gy Gone	Gone Min Ein		M	N	Bamar			5	6	4	0.30	Y		Wage Worker	Monsoon Paddy	Black Gram	-	1	70	1,800,000	Y	
102	Ta Gy Gone	Gone Min Ein		M	N	Bamar			Graduate	8	7	1	1.06	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,900,000	Y
103	Ta Gy Gone	Gone Min Ein		M	N	Bamar			Monastery	2	1	1	0.88	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	600,000	Y
104	Ta Gy Gone	Gone Min Ein		M	N	Bamar			10	4	1	3.36	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	3,000,000	Y	
105	Ta Gy Gone	Gone Min Ein		M	N	Bamar			10	6	3	4	0.95	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,300,000	Y
106	Aung Zabu	Aung Zabu		F	N	Bamar			4	5	8	2	4.35	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,400,000	N
107	Aung Zabu	Aung Zabu		F	Y	Bamar			10	3	3	1	2.71	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,800,000	N
108	Aung Zabu	Aung Zabu		F	N	Bamar			10	6	3	5	3.12	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	70	2,200,000	N
109	Aung Zabu	Aung Zabu		F	N	Bamar			Graduate	4	8	2	5.44	Y		Grocery Shop	Summer Paddy	Monsoon Paddy	Black Gram	2	80	3,600,000	N
110	Aung Zabu	Aung Zabu		F	N	Bamar			4	6	8	3	1.29	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,600,000	Y
111	Aung Zabu	Aung Zabu		F	N	Bamar			Graduate	3	1	2	2.10	Y		Government Staff	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,500,000	N
112	Aung Zabu	Aung Zabu		F	N	Bamar			4	5	8	2	1.67	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,700,000	N
113	Aung Zabu	Aung Zabu		F	N	Bamar			4	3	3	1	0.74	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,000,000	Y
114	Aung Zabu	Aung Zabu		F	Y	Bamar			4	4	8	4	2.68	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	800,000	N
115	Aung Zabu	Aung Zabu		F	N	Bamar			Graduate	3	2	1	2.12	Y		Government Staff	Summer Paddy	Monsoon Paddy	Black Gram	2	80	800,000	N
116	Aung Zabu	Aung Zabu		F	N	Bamar			8	2	1	1	0.40	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	75	2,000,000	N
117	Aung Zabu	Aung Zabu		F	N	Bamar			Graduate	8	4	5	1.00	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	70	1,300,000	N
118	Aung Zabu	Aung Zabu		M	N	Bamar			4	5	8	4	2.00	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,300,000	N
119	Aung Zabu	Aung Zabu		M	N	Bamar			6	5	7	3	2.31	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,200,000	N
120	Aung Zabu	Aung Zabu		M	N	Bamar			10	3	8	1	5.55	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,500,000	N
121	Aung Zabu	Aung Zabu		M	N	Bamar			Graduate	2	1	1	1.88	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	1,500,000	Y
122	Aung Zabu	Aung Zabu		M	N	Bamar			10	3	8	1	13.45	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	4,900,000	N
123	Aung Zabu	Aung Zabu		M	N	Bamar			8	4	8	2	0.30	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	80	900,000	Y
124	Aung Zabu	Aung Zabu		M	N	Bamar			7	3	2	1	1.53	Y		Trader	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,200,000	N
125	Aung Zabu	Aung Zabu		M	N	Bamar			Graduate	11	6	3	10.54	Y		Agriculture	Monsoon Paddy	Black Gram	Paddy	2	70	3,940,000	Y
126	Aung Zabu	Aung Zabu		M	N	Bamar			7	5	3	3	3.02	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	75	2,800,000	N
127	Aung Zabu	Aung Zabu		M	N	Bamar			5	4	8	1	1.17	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	1,300,000	N
128	Aung Zabu	Aung Zabu		M	N	Bamar			4	6	8	5	2.38	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	80	2,500,000	N
129	Aung Zabu	Aung Zabu		M	N	Bamar			8	3	1	2	2.70	Y		Agriculture	Summer Paddy	Monsoon Paddy	Black Gram	2	70	2,000,000	N
130	Kan Oo (gyin ma nar)	Kan Oo		F	N	Bamar			8	6	8	3	6.52	Y		Trader	Monsoon Paddy	Black Gram	-	1	70	800,000	Y
131	Kan Oo (gyin ma nar)	Kan Oo		F	N	Bamar			4	7	4	3	7.13	Y		Agriculture	Monsoon Paddy	Black Gram	-	1	70	4,500,000	Y

No.	Village		Status of family										Land			Livelihood							Awareness	
	Village Tract	Village	Name of household	Sex of holder (M or F)	Widow holder? (Y/N)	Ethnic name	Age of holder	Telephone number	Educational status of household	Number of family members	Number of male family member	Number of female family member	Area of farmland under project (acre)	Land tenure, have title deed? (Y/N)	Area to be left due to road/canal construction (acre)	Main income source	1st Main cultivated crop	2nd Main cultivated crop	3rd Main cultivated crop	How many times of paddy cultivation per year	Average yield of paddy (bushels/acre)	Annual household cash income (Kyats)	Aware about the Project? (Y/N)	
Note				B					C			D			E			F			G			
132	Kan Oo (pyin ma nar)	Kan De		F	N	Bamar			7	4	2	2	1.43	Y		Agriculture	Sarawar Paddy	Monsoon Paddy	Black Gram	2	95	2,200,000	N	
133	Kan Oo (pyin ma nar)	Kan De		M	N	Bamar			10	4	1	1	1.24	Y		Agriculture	Monsoon Paddy	Black Gram		1	80	1,800,000	Y	
134	Kan Oo (pyin ma nar)	Kan De		M	N	Bamar			10	5	2	3	1.47	Y		Agriculture	Monsoon Paddy	Black Gram		1	15	2,000,000	N	
135	Kan Oo (pyin ma nar)	Kan De		M	N	Bamar			4	8	2	5	1.90	Y		Agriculture	Monsoon Paddy	Black Gram		1	10	1,000,000	Y	
136	Kan Oo (pyin ma nar)	Kan De		M	N	Bamar			8	8	2	4	6.52	Y		Carpenter	Monsoon Paddy	Black Gram		1	10	750,000	Y	
137	Kan Oo (pyin ma nar)	Kan De		M	N	Bamar			4	4	2	2	1.88	Y		Agriculture	Sarawar Paddy	Monsoon Paddy	Black Gram	2	90	3,500,000	Y	
138	Kan Oo (pyin ma nar)	Kan De		M	N	Bamar			8	8	2	4	6.81	Y		Agriculture	Monsoon Paddy	Black Gram		1	15	1,000,000	Y	
Total												625	361	224	308.47									

Note: A: Ind if the interviewee was additionally asked by structure of socio-economic household questionnaire

- B: Indicate the sex of the household by M (male) or F (female)
- C: Indicate the level (grade/level) of the education the household head took
- D: Indicate the farmland area (acre) which is to be covered by the land consolidation Project
- E: Indicate if the household has the official land title right or not by Y (yes) or N (no)
- F: If whether land is affected/lost by a farm road and/or canal to be newly constructed under the Project, indicate the area (acre)
- G: Indicate the main income source e.g. agriculture, livestock, cottage industry, employment, etc

H: Indicate the most important crop cultivated in the farmland to be covered by the Project

- I: Indicate the 2nd most important crop cultivated in the farmland to be covered by the Project
- J: Indicate, if any, the 3rd most important crop cultivated in the farmland to be covered by the Project
- K: Indicate how many cultivation of paddy is carried out in the farmland to be covered by the Project
- L: Indicate the average yield of paddy in the farmland to be covered by the Project
- M: Indicate the annual household cash income
- N: If female has been informed about land consolidation Project or not, indicate Y (yes) or otherwise N (no)

**VII.5 House Holds Survey**

<b>Interviewer's Name:</b>
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**Farm Household Questionnaire (Only for Farmers under the Land Consolidation Project)**

**Carry out this Questionnaire form survey for at least 20% of the Project Beneficiaries.**

Date: \_\_\_\_\_ Farmer's Name: \_\_\_\_\_ Tel: \_\_\_\_\_

Village Name: \_\_\_\_\_ Village Tract Name: \_\_\_\_\_ TS: \_\_\_\_\_

**1. Family Structure, All the members are those who eat in your house.**

Member	Age	Sex		Education				
		Male	Female	None Tick	Monastery Tick	Last Standard	Matriculation Passed? Y/N	Higher Education, Y/N
Husband		√						
Wife			√					
Children								
Parents								
Others								

**2. Children who are now away from your house due to marriage, schooling, migrant work, etc.**

Member	Age	Sex		Education				
		Male	Female	None Tick	Monastery Tick	Last Standard	Matriculation Passed? Y/N	Higher Education, Y/N
Children								

**3. What properties do you have ?**

<input type="checkbox"/> Radio	<input type="checkbox"/> TV set	<input type="checkbox"/> Electric Light	<input type="checkbox"/> Sewing machine	<input type="checkbox"/> Tube well
<input type="checkbox"/> Cattle Plough	<input type="checkbox"/> Bull cart	<input type="checkbox"/> Bicycle	<input type="checkbox"/> Motorcycle	<input type="checkbox"/> Car
<input type="checkbox"/> Hand tractor	<input type="checkbox"/> Engine pump	<input type="checkbox"/> Thresher	<input type="checkbox"/> Sprayer for pesticide	<input type="checkbox"/> Rice miller

**4. What water source for drinking/cooking do you use ?**

<input type="checkbox"/> Dug well	<input type="checkbox"/> Own tubewell	<input type="checkbox"/> Neighbor's tubewell	<input type="checkbox"/> Canal	<input type="checkbox"/> River/stream
<input type="checkbox"/> Pond/dam	<input type="checkbox"/> Others ( )	<input type="checkbox"/> Others ( )		

**5. How much acre farms do you have by type?**

Type	Acre	What crops do you cultivate?		
		Pre-monsoon	Monsoon	Winter
Low land ( <i>le</i> )				
Upland ( <i>ya</i> )				
<i>Kaincun</i>				
Others( )				
Total				

**5.1 Out of the low land (paddy area), how many acres of land are located in the Land Consolidation Project Area (how many acres of the paddy land will be land-consolidated) ? \_\_\_\_\_ Acre**

**6. How have you got the farm land ?**

How you have got?	Acre	Remarks
<input type="checkbox"/> Inherited from your farther		
<input type="checkbox"/> Inherited from your farther in law		Brought by your wife
<input type="checkbox"/> You bought		If You bought, When _____ Year
<input type="checkbox"/> As mortgage for loan		
<input type="checkbox"/> Others, please specify in Remarks		

**7. Out of last 10 years, how many years have you had by following production for the farmland?**

Crops	Almost nothing (less than 20%)	Worse (20 – 80%)	Average (80 – 120%)	Better (Over 120%)	Total
Paddy					<b>10</b>
Pulses (if cultivated)					<b>10</b>

**7.1 How much are the crop yield in Basket per Acre by crop situation for the farm land?**

Crops	Almost nothing (less than 20%)	Worse (20 – 80%)	Average (80 – 120%)	Better (Over 120%)
Paddy				
Pulses (if cultivated)				

**7.2 What were the reasons for above Worse and Almost Nothing Harvest ?**

No.	Reasons
1.	
2.	
3.	

**8. What difficulties/ problems do you have in agriculture production/income improvement?**

Items	Tick
Small farm size to feed your family	
Water shortage for irrigation	
Low rainfall	
Unstable rainfall (fluctuating rainfall year by year)	
Flood Occurrence	
Lack of agriculture finance(loan)	
High price of agriculture input	
Lack of agriculture input	
Lack of farm labors and/or lack of draft animal	
Low fertility of the soils	

Low farm-gate price of crops	
Lack of market	
Bad/poor transportation road to market	
Others (specify: _____)	

**9. If you have been doing farming since long time ago, please answer the trend;**

1: Very Bad, 2: Bad, 3: Just OK (not bad not good, just average), 4: Good, 5: Very Good

NOW	10 years ago (around 2003)	20 years ago (around 1993)	30 years ago (around 1983)

If the 'NOW' is better than before, why? \_\_\_\_\_

If the 'NOW' is worse than before, why? \_\_\_\_\_

**10. Where do you obtain information for new agriculture technologies ?**

MAS extension staff,  From other farmers,  Book,  TV,  Others (specify: \_\_\_\_\_)

**11. If you have your own agricultural machinery (ex. tractor, hand-tractor, combined harvester), please describe the following information, including whether or not it is also rented out.**

Type of Machine	Year Purchased	Price at that time, Kyats	Rent out
			Yes/ No
			Yes/ No
			Yes/ No
			Yes/ No

**12. What crops did you plant last year in the farmland to be covered by the land consolidation project ?**

Please describe the cropping calendar by crop planed in the irrigated farmland.

Area Paddy (area: _____ acre)	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
(area: _____ acre)												
(area: _____ acre)												
(area: _____ acre)												
<b>Examples</b>												
Paddy (dry season) (0.6 acre)	→											←
Paddy (rainy season) (0.8 acre)					←				→			
Chick pea (0.8 acre)	→											←

**13. What kind of and how much amount of inputs by crop do you use in the farmland to be covered by the land consolidation project?**

Crop	Acre	Seed (kg)	Urea (Bag)	Compound (Bag)	TSP (Bag)	Compost (No. of cart)	Insecticide (Lit.)	Fungicide (Lit.)



**13.1 How much does it cost for each input in relation to above table ?**

Crop	Acre	Seed (Kyats)	Urea (Kyats)	Compound (Kyats)	TSP (Kyats)	Compost (Kyats)	Insecticide (Kyats)	Fungicide (Kyats)	Total (Kyats)

**13.2 How much does labor/animal/machine cost for one paddy farming in the farmland to be covered by the land consolidation project?****Size of cultivated (            acre)**

Item	Farm labor (Kyats)	Rental Animal (Kyats)	Rental Machine (Kyats)	Total (Kyats)
Land Cleaning				
Plowing				
Soil Pudding				
Seeding				
Transplanting				
Fertilizer Application				
Pesticide/fungicide Application				
Herbicide Application				
Weeding				
Harvesting				
Threshing				
Transporting (farm to dry yard)				
Drying/Packing				
Transporting (dry yard to market)				
Water Fee				
Total				

**13.3 How much does labor/animal/machine cost for other farming than paddy in the farmland to be covered by the land consolidation project?**

**Crop ( ), Size of cultivated ( acre)**

Item	Farm labor (Kyats)	Rental Animal (Kyats)	Rental Machine (Kyats)	Total (Kyats)
Land Cleaning				
Plowing				
Soil Pudding				
Seeding				
Transplanting				
Fertilizer Application				
Pesticide/fungicide Application				
Herbicide Application				
Weeding				
Harvesting				
Threshing				
Transporting (farm to dry yard)				
Drying/Packing				
Transporting (dry yard to market)				
Water Fee				
<b>Total</b>				

**INCOME PART****21.1 How much are the agriculture gross profit by crop in an average (normal) year ?****Note: this gross profit comes from all his/her farmlands (not only project area but also from other farms)**

Crop	Acre harvested	Production (basket) A=(a+b+c)	Yield (basket/ac)	Home consumption (Basket) (a)	Seed (Basket) (b)	Selling (Basket) (c)	Farm gate price, Kyats/basket (B)	Gross Profit Kyats AxB
<b>Total</b>								Kyats

A

**21.2 If you or your family members work as Farm Labors, please answer the following:**

Who works ?	Food/snack Provision?	Wage Kyats/ half or full day	Working Days in a Year	Total Kyats/ year
		<input type="checkbox"/> full day <input type="checkbox"/> half day		
		<input type="checkbox"/> full day <input type="checkbox"/> half day		
		<input type="checkbox"/> full day <input type="checkbox"/> half day		
		<input type="checkbox"/> full day <input type="checkbox"/> half day		
		<input type="checkbox"/> full day <input type="checkbox"/> half day		
<b>Total</b>				Kyats/

B

**Who works: 1. Husband, 2. Wife, 3. Son, 4. Daughter, 5. Parent, 6. Others (specify)****Food/snack: 1. Breakfast, 2. Lunch, 3. Supper, 4. Snack (1 time), 5. Snack (2 times)****21.3 What livestock do you have, and how much do you earn from livestock per year ?**

Livestock type	How many you have?	How many/much you sell a year?	Average selling unit price, Kyats		Total Kyats/ year
Local cow		selling			
		Milk: <input type="checkbox"/> viss/day	Total Milk, viss	Unit price	
		Months			
		From lending oxen:			
Sheep					
Goat					
Pig					
Chicken					
Eggs					
Duck					
Quail					
Dairy Cow (cross)		Milk <input type="checkbox"/> viss	Total Milk, viss	Unit price	
		Months			
Others( )					
<b>Total</b>					Kyats

C

**21.4 Do you have any family members who are employed as wage worker ?**

Who is employed ?	What Job ?	Food/snack Provision?	Wage Kyats/ day	Working Days in a Year	Total income Kyats/ year
<b>Total</b>					Kyats

Who employed: 1. Husband, 2. Wife, 3. Son, 4. Daughter, 5. Parent, 6. Others (specify)  
 Food/snack: 1. Breakfast, 2. Lunch, 3. Supper, 4. Snack (1 time), 5. Snack (2 times)

D

**21.5 Does your family run any cottage industry or broker (here, not employed) ?**

Who does ?	What Products ?	How many employed	Gross sale, Kyats/ day	Expenses, Kyats/ day	Net Profit, Kyats/ day	Working days a year	Net Profit, Kyats/year
<b>Total</b>							Kyats

Who does: 1. Husband, 2. Wife, 3. Son, 4. Daughter, 5. Parent, 6. Others (specify)

E

**21.6 Apart from farming, farm labor, cottage industry & livestock, what other incomes you have ?**

- Migrant work: \_\_\_\_\_ Kyats in total per year (within Myanmar)
  - Remittance: \_\_\_\_\_ Kyats in total per year (within Myanmar & from abroad)
  - Others 1( \_\_\_\_\_ ): \_\_\_\_\_ Kyats in total per year
  - Others 2( \_\_\_\_\_ ): \_\_\_\_\_ Kyats in total per year
  - Others 3( \_\_\_\_\_ ): \_\_\_\_\_ Kyats in total per year
- Total of Other Incomes** \_\_\_\_\_ **Kyats in total per year**

F

**21.7 Total Income**

Type	Type	Kyats per year
A	Farming (Gross)	
B	Farm labor (Net)	
C	Livestock (Gross)	
D	Cottage (employed), Net	
E	Cottage/ broker (self-running), Net	
F	Other Incomes, Net	
<b>Total</b>		

G

22.1 Do you know about Land Consolidation Project?  Yes  No

22.2 Do you accept to change your farmland with other farmer's farmland if the purpose is to consolidate fragmented piece of farmlands?  Yes  No

22.3 Can you agree to donate a part of your farmland for the construction of farm roads and/or canals within the Project area ?  Yes  No

22.4 Up to how much percentage of the farmland, can you agree to donate for the construction of farm roads and/or canals within the Project area ? \_\_\_\_\_ % (or \_\_\_\_\_ acre)

**1. Family Structure**

Village	Number						Age					
	Family number / HH			Children / HH			Husband			Wife		
	Ave	Min	Max	Male	Female	Total	Ave	Min	Max	Ave	Min	Max
Gone Min Inn	5	2	11	1.9	1.3	3.2	55	36	84	49	33	68
Sha Taw	5	3	7	2	0.8	2.8	53	37	67	53	34	60
Ayinlo	6	4	8	1.8	2.1	3.9	56	38	91	52	33	87
Aungzabu	4	3	7	0.7	2	2.7	61	32	86	53	32	65
Total	5	3	8.25	1.6	1.55	3.15	56.25	35.75	82	51.75	33	70

**2. Family education**

## Father's Education

Village	No education	Monastery	Grade										Subtotal	Higher Education	Total	
			1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th				
Gone Min Inn		3					3	2	2	2	7	1	5	25	2	27
Sha Taw		1					1	1		1				4		4
Ayinlo	1	2					2	2		2	2	2		13		13
Aungzabu	1												3	4	1	5
Total	2	6	0	0	0	6	5	2	5	9	3	8	46	3	49	

## Mother's Education

Village	No education	Monastery	Grade										Subtotal	Higher Education	Total	
			1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th				
Gone Min Inn		2					12	3	3	2	2	1	1	26		26
Sha Taw		3					1		1					5		5
Ayinlo	1	2					5	3		1	1			13		13
Aungzabu		1								1	1		1	4	1	5
Total	1	8	0	0	0	18	6	4	4	4	4	1	2	48	1	49

## Children's Education

Village	No education	Monastery	Grade										Subtotal	Higher Education	Total
			1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th			
Gone Min Inn	8		4		4	4	11	6	7	12	4	21	81	17	98
Sha Taw		1			1	4	4	1	1	1			13	2	15
Ayinlo	5	1			1	6	4		9	5	5	4	40	8	48
Aungzabu	1					1			1			4	7	9	16
Total	14	2	4	0	6	15	19	7	18	18	9	29	141	36	177

**3. Farmer's Properties**

Village	Radio	TV set	Electric Light	Sewing machine	Tube well	Cattle Plough	Bull cart	Bicycle	Motorcycle	Car	Hand tractor	Engine pump	Thresher	Slayer for pesticide	Rice mill
Gone Min Inn	24	24	21	4	9	6	4	21	19	1	5	5	6	21	1
Sha Taw	4	5	5	1	1	-	-	1	2	-	-	1	-	5	-
Ayinlo	10	12	13	-	9	1	4	10	8	1	5	2	1	10	-
Aungzabu	6	6	6	2	4	-	-	2	6	-	-	-	-	5	-
Total	11	12	11	2	6	2	2	9	9	1	3	2	2	10	0

**4. Water Resource**

Village	Dug well	Own tubewell	Neighbor's tubewell	Pond/dam	Others
Gone Min Inn	1	8	21	0	4
Sha Taw	2	1	1	0	1
Ayinlo	1	7	6	0	0
Aungzabu	0	5	1	0	0
Total	4	21	29	0	5

**5. Cropping area**

Village Tract	Low Land									Upland					
	Monsoon paddy			Winter blackgram			Pre Monsoon Paddy			Monsoon paddy			Winter crop		
	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max
Gone Min Inn	3.51	0.30	18	3.09	0.80	18	0.42	1.20	5.7						
Sha Taw	2.09	1.00	3.60	2.09	1.00	3.60									
Ayinlo	5.69	0.48	25.00	6.82	0.48	25.00	6.12	2	25.00						
Aungzabu	0.55	1.20	2.10	2.33	0.97	5.57	1.398	0.97	5.57						
Total	2.96	0.30	25	3.58	0.48	25	6.12	2.00	25						

**5.1. Paddy land area in consolidation area**

Village Tract	Average
Gone Min Inn	3.28
Sha Taw	2.04
Ayinlo	7.34
Aungzabu	2.33
Total	3.75

**6. The way got the farm land**

Village Tract	Inherited from father	Inherited from father in law	Bought
Gone Min Inn	17	7	3
Sha Taw	2		4
Ayinlo	9	2	5
Aungzabu	6	1	1
Total	34	10	13

**7. Yield in last 10 years**

Village	Number of Years (Paddy)				Total
	Almost nothing (Less than 20%)	Worse (20-80%)	Average (80-120%)	Better (Over 120%)	
Gone Min Inn	-	2.07	7.70	0.23	10.00
Sha Taw	0.20	3.20	6.60	-	10.00
Ayinlo	0.08	0.85	9.08	-	10.00
Aungzabu	-	-	10.00	-	10.00
Total	0.07	1.53	8.35	0.06	10.00

Village	Black Gram				Total
	Almost nothing (Less than 20%)	Worse (20-80%)	Average (80-120%)	Better (Over 120%)	
Gone Min Inn	0.50	3.13	5.76	0.60	10.00
Sha Taw	2.20	3.40	4.40	-	10.00
Ayinlo	0.54	2.77	6.69	-	10.00
Aungzabu	-	0.83	9.17	-	10.00
Total	0.81	2.53	6.51	0.15	10.00

**7.1 Yield in basket per acre by crop for the farm land**

Village	Paddy (bsk)			
	Almost nothing (Less than 20%)	Worse (20-80%)	Average (80-120%)	Better (Over 120%) maximum
Gone Min Inn	-	30.17	79.00	6.67
Sha Taw	-	22.00	58.00	-
Ayinlo	-	27.31	90.54	-
Aungzabu	-	24.17	81.67	-
4 Villages Total	-	26.49	75.85	6.67

Village	Black Gram (bsk)			
	Almost nothing (Less than 20%)	Worse (20-80%)	Average (80-120%)	Better (Over 120%) maximum
Gone Min Inn	-	5.17	13.27	2.33
Sha Taw	-	3.00	10.00	-
Ayinlo	-	1.77	16.38	-
Aungzabu	-	-	12.50	-
4 Villages Total	-	3.31	13.04	2.33

**8. Difficulties/ problems in agriculture production/ income improvement**

Items	Number
Small farm size to feed your family	22
Water shortage for irrigation	40
Low rainfall	21
Unstable rainfall (fluctuating rainfall year by year)	22
Flood Occurrence	3
Lack of agriculture finance (loan)	21
High price of agriculture input	37
Lack of agriculture input	19
Lack of farm labors and/or lack of draft animal	26
Low fertility of the soils	29
Low farm-gate price of crops	26
Lack of market	20
Bad/poor transportation road to market	7

**9. The trend for farming since long time ago**

	NOW	10 years ago	20 years ago	30 years ago
Very bad	1	0	0	1
Bad	17	10	2	1
Just OK	29	30	17	17
Good	7	12	16	15
Very Good	0	0	0	0

**9.1 The reason why farming is better than before**

Items	Number	Percentage
Disease	2	7 %
Pests	2	7 %
Bad weather	1	4 %
Lack of fertilizer	3	11 %
Lack of labor	4	14 %
Lack of irrigation water	5	18 %
Low price of crop	3	11 %
High cost of input	7	25 %
repeated cultivation	1	4 %

**9.2 The reason why farming is worse than before**

Items	Number	Percentage
More skilled labors	1	10 %
Enough fertilizer	1	10 %
Using advanced machineries	4	40 %
High price of crop	1	10 %
Management improving	1	10 %
Government improvement programe	1	10 %
New technology	1	10 %

**10. Information source of agriculture technologies**

Items	Number
MAS Extension Staff	28
From other farmers	22
Book	5
TV	3
Others	13

Others: Company(6), Advertisement(3), Radio(3), Own(1)

**11. Agricultural machinery**

	Purchased year	Number	Average cost (Kyat)	For rental	For our use
Tractor	1,998	1	260,000	1	
Hand tractor	1,998	2	375,000		2
	2,000	4	702,500	1	3
	2,001	1	600,000		1
	2,002	1	800,000		1
	2,003	1	350,000	1	
	2,008	1	650,000		1
Thresher	1,995	2	400,000	2	
	2,006	1	1,300,000		1
Water pump	2,001	1	150,000		1
	2,010	1	60,000		1

**12. Cropping season**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Summer paddy				11 farmers								
Monsoon paddy								54 farmers				
Black gram		54 farmers										

**13. Kinds and amount of inputs****Paddy**

Village	Urea	Compound	TSP	Compost	Insecticide	Fungicide	Herbicide
	Amount/ac (bag)	Amount/ac (50kg)	Amount/ac (50kg)	Amount/ac (cart No)	Amount/ac (1lit)	Amount/ac (g)	Amount/ac (1lit)
Gone Min Inn	0.35	0.21	0.03	0.31	0.12	4.83	0.14
Sha Taw	0.54	0.39	0.10	0.98	0.20	-	0.29
Ayinlo	0.14	0.11	-	0.10	0.07	-	0.06
Aungzabu	0.47	0.29	0.04	0.21	0.09	-	0.36
Average	0.37	0.25	0.04	0.40	0.12	1.21	0.21

**Blackgram**

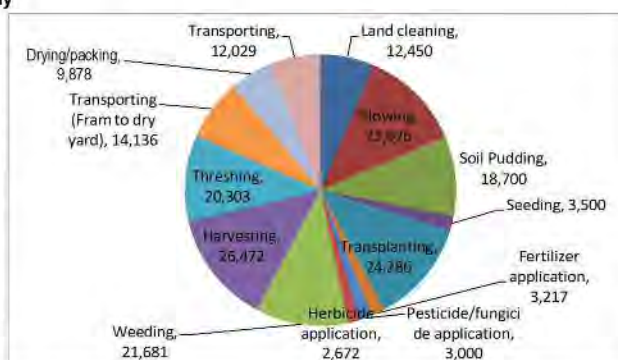
Village	Insecticide	Fungicide	Herbicide	Hormone
	Amount/ac (lit)	Amount/ac (g)	Amount/ac (lit)	Amount/ac (kg)
Gone Min Inn	0.25	6.91	0.04	0.11
Sha Taw	0.34	0.10	-	0.20
Ayinlo	0.05	0.05	-	0.08
Aungzabu	0.98	0.11	-	0.76
Average	0.41	1.79	0.01	0.29

**13.1 Cost for inputs (Kyat)**

Village	Urea(bag)	Compound (50kg)	T-super(50kg)	Compost (No.of cart)	Insecticide(1lit/ 1000g)	Fungicide (1000g)	Herbicide (1lit/ 1000 g)	Hormone (kg)
Gone Min Inn	19,009.66	13,140.91	28,173.08	2,703.13	15,161.29	9,000.00	12,387.54	8,790.70
Sha Tau	19,636.36	8,750.00	15,000.00	3,150.00	13,000.00	10,000.00	11,833.33	10,000.00
Ayinlo	22,031.25	12,650.00	24,000.00	3,000.00	13,083.33	14,750.00	12,500.00	11,333.33
Aungzabu	20,461.54	22,375.00	30,000.00	2,666.67	7,200.00	8,000.00	12,800.00	7,142.86
Average	20,284.70	14,228.98	24,293.27	2,879.95	12,111.16	10,437.50	12,380.22	9,316.72

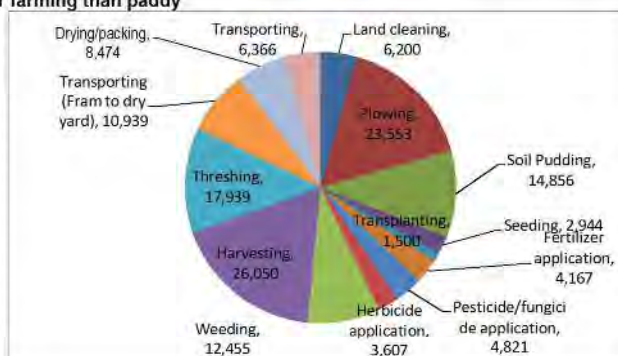
**13.2 Average cost for labor/ animal/ machine for paddy**

Items	Average input (Kyat)
Land cleaning	12,450
Plowing	23,926
Soil Pudding	18,700
Seeding	3,500
Transplanting	24,286
Fertilizer application	3,217
Pesticide/fungicide application	3,000
Herbicide application	2,672
Weeding	21,681
Harvesting	26,472
Threshing	20,303
Transporting (Fram to dry yard)	14,136
Drying/packing	9,878
Transporting	12,029



**13.3 Average cost for labor/ animal/ machine for other farming than paddy**

Items	Average input (Kyat)
Land cleaning	6,200
Plowing	23,553
Soil Pudding	14,856
Seeding	2,944
Transplanting	1,500
Fertilizer application	4,167
Pesticide/fungicide application	4,821
Herbicide application	3,607
Weeding	12,455
Harvesting	26,050
Threshing	17,939
Transporting (Fram to dry yard)	10,939
Drying/packing	8,474
Transporting	6,366



**21. Amount of income in a yaer (Kyat)**

Village	Farming	Farm Labor	Livestock	Cottage (Net)	Cottage	Other Incomes	Total
Gone Min Inn	40,091,300	3,780,000	1,930,000	4,050,000	5,267,250	6,402,500	61,521,050
Sha Tau	2,838,500	780,000	350,000	240,000	765,000	-	4,973,500
Ayinlo	46,534,600	337,500	3,200,000	3,833,999	4,987,500	16,941,600	75,835,199
Aungzabu	6,789,600	-	-	3,240,000	-	5,178,000	15,207,600
Average	24,063,500	1,632,500	1,826,667	2,841,000	3,673,250	9,507,367	39,384,337