

Table 2.2.35 Outline of Village Grant Fund

Implementer: Implementation Committee and village people

Fund source: Executing agency

Supporting organization: Local NGO

Purpose: To empower the village community in the process of the small projects using village grand fund

Amount of fund: Maximum amount is Rs. 40 million per village

Items to be done:

- 1) Formulation of VAP
- 2) Selection of items to be covered by the village grand fund
- 3) Implementation of the detailed survey and formulation of plan
- 4) Consensus building for Plan at the workshop
- 5) Finalization of MOU including approval of items to be done using village grant fund
- 6) Implementation of items using village grant fund including supporting program
- 7) Monitoring

Condition of fund use:

The fund can be utilized by the decision of implementation committee with consent of village people. However, the following limitation of fund use should be applied.

- 1) The items proposed in the VAP, but not implemented in the project works.
- 2) The items fully agreed with village people
- 3) The items not include cash distribution to individual people
- 4) The items supported by the detailed survey and planning result to be made by the village.
- 5) The items approved by executing agency

Duration of fund use: One year

Responsibility of village:

- Maintain of account book audited by village administration,
- Maintain of record and meeting records
- O&M of facilities and equipment

Table 2.2.36 Outline of Education Program

<u>Implementer:</u>	Implementation committee and executing agency
<u>Fund source:</u>	Executing agency
<u>Supporting organization:</u>	Local NGO
<u>Purpose:</u>	To increase understandings of importance of watershed and Wonogiri dam reservoir
<u>Items to be done:</u>	
1)	Preparation and distribution of pamphlet, video CD, etc
2)	Establishment of village library to keep the VAP, guideline or manual to be prepared by the project
3)	Special lecture to the elementary school, junior high school, and PTA activities
4)	Special lecture to the extension staff and local NGOs
5)	Implementation of study tour to the Wonogiri dam
6)	Implementation of campaign activities in the festival or town events etc.

Table 2.2.37 Monitoring and Evaluation Plan at Village Level

Program	Objectives/Description	Monitoring Items	Estimation of Program Requirements/Remarks	Estimated Program Cost (Rp.million)
1. Progress of works 1-1 Institutions	<ul style="list-style-type: none"> - To monitor the establishment and activities of implementation committee - To monitor the establishment and activities of related - Evaluation of activities 	<ul style="list-style-type: none"> - Establishment date - Activity record - No. of Participants in each meeting 	<ul style="list-style-type: none"> - Provision of Materials and - Labor cost 	Including consultant service
1-2 Project works	<ul style="list-style-type: none"> - To monitor the project works - Evaluation based on the achievement against the schedule 	<ul style="list-style-type: none"> - Terracing - Drainage and drop structures - Seedling preparation and transplanting - Grass planting 	- Monitoring form	Including consultant service
1-3 Supporting progress	<ul style="list-style-type: none"> - To monitor the supporting works - To evaluate based on the achievement against the schedule 	<ul style="list-style-type: none"> - Soil & water conservation measures - Land management & agricultural - Community development 	- Monitoring form	Including consultant service
2. Impact of Project 2-1 Demonstration plot	<ul style="list-style-type: none"> - To establish three plots (20 m2) of i) bare land, ii) present condition, iii) improved terrace. - Installation of the rainfall gauges - Measurement of rainfall and soil erosion volume - Presentation of result 	<ul style="list-style-type: none"> - Rainfall - Soil erosion volume 	<ul style="list-style-type: none"> - Provision of Materials and - Labor cost - Monitoring form 	1 Plot Establishment x 10 locations 10.0 2 Measurement x 10 locations 5.0 3 Administration 15.0 Total 165.0
2-2 Project Works	<ul style="list-style-type: none"> - To carry out baseline survey - To establish standard for assessment of impact - To carry out data collection - To evaluate based on the standard 	<ul style="list-style-type: none"> - Land use and cropping pattern - Slope of terrace - Maintenance condition of drainage - Maintenance condition of cover vegetable - Growth condition of planted trees 	- Monitoring form	Including consultant service
2-3 Supporting program	<ul style="list-style-type: none"> - To establish standard for assessment of impact - To carry out data collection/questionnaire survey - To evaluate based on the standard 	<ul style="list-style-type: none"> - No. participants - Satisfaction of participants - Use ratio of proposed practice - Change of farming practice 	- Monitoring form	Including consultant service
2-4 Social and economic change	<ul style="list-style-type: none"> - To carry out baseline survey - To establish standard for assessment of impact - To carry out data collection/questionnaire survey - To evaluate based on the standard 	<ul style="list-style-type: none"> - Satisfaction to the project - Satisfaction to NGO activities - Change of rural life - Change of household economic situation 	- Monitoring form	Including consultant service
3. Feedback to the project design 3-1 Project design	<ul style="list-style-type: none"> - To check the design change of the project 	<ul style="list-style-type: none"> - Request letters, meeting record for design changes 	- Monitoring form	Including consultant service
3-2 Financial status	<ul style="list-style-type: none"> - To check account book for the project - To check monitoring system at the village level - To assess the difference between plan and actual 	<ul style="list-style-type: none"> - Change of budget use - Assessment of budget use 	- Monitoring form	Including consultant service

Table 2.2.42 Future Annual Average Soil Loss based on Landuse Class

(unit : thousand ton)

Land Use	Slope (%)	Sediment Yield (t/ha/year)					Total
		0 - 20	20 - 50	50 - 250	250 - 1,000	Above 1,000	
Paddy Field	0 - 8	1	0	0	0	0	1
	8 - 15	2	0	0	0	0	2
	15 - 25	3	0	0	0	0	3
	25 - 40	3	0	0	0	0	3
	Above 40	9	0	0	0	0	9
Sub-Total		18	0	0	0	0	18
Home Settlement Area							
Housing Yard and Garden	0 - 8	12	34	19	0	0	65
	8 - 15	1	3	135	0	0	139
	15 - 25	2	1	129	105	0	237
	25 - 40	1	4	7	344	3	358
	Above 40	0	8	5	382	371	766
Sub-Total		16	48	296	831	373	1,564
Upland Field	0 - 8	43	115	170	0	0	327
	8 - 15	2	6	385	7	0	400
	15 - 25	4	3	298	141	0	446
	25 - 40	4	3	29	419	3	458
	Above 40	0	9	8	661	63	742
Sub-Total		53	136	890	1,229	66	2,373
Sub-Total		69	185	1,186	2,059	439	3,937
Upland Field	0 - 8	37	73	42	0	0	152
	8 - 15	12	77	110	2	0	201
	15 - 25	17	25	324	18	0	385
	25 - 40	26	28	565	230	1	850
	Above 40	55	62	254	1,878	19	2,268
Sub-Total		147	265	1,295	2,128	20	3,856
Forest/Orchard/Plantation	0 - 8	17	11	0	0	0	28
	8 - 15	3	36	34	0	0	73
	15 - 25	3	10	132	0	0	144
	25 - 40	4	12	213	26	0	255
	Above 40	10	1	144	416	0	570
Sub-Total		37	69	523	442	0	1,071
Dense Forest	0 - 8	0	0	0	0	0	0
	8 - 15	0	0	0	0	0	0
	15 - 25	0	1	0	0	0	1
	25 - 40	0	0	2	0	0	3
	Above 40	0	0	9	0	0	9
Sub-Total		1	1	11	0	0	14
State Forest							
Dense Forest	0 - 8	0	0	0	0	0	0
	8 - 15	0	0	0	0	0	0
	15 - 25	0	1	0	0	0	1
	25 - 40	0	1	2	0	0	3
	Above 40	1	0	11	0	0	12
Sub-Total		1	1	14	0	0	16
Other Land Use	0 - 8	2	0	0	0	0	2
	8 - 15	3	3	0	0	0	5
	15 - 25	3	11	4	0	0	17
	25 - 40	6	12	34	0	0	52
	Above 40	31	2	147	0	0	180
Sub-Total		44	28	184	0	0	256
Sub-Total		45	29	198	0	0	272
Others	0 - 8	0	1	0	0	0	1
	8 - 15	0	1	0	0	0	2
	15 - 25	1	1	1	0	1	4
	25 - 40	0	2	4	0	1	7
	Above 40	2	2	11	3	2	19
Sub-Total		4	5	16	3	5	34
Grand-Total		321	555	3,229	4,633	464	9,202

Table 2.2.43 Future Annual Average Soil Loss/ha based on Landuse Class

(unit : ton per hectare)

Land Use	Slope (%)	Sediment Yield (t/ha/year)					Total
		0 - 20	20 - 50	50 - 250	250 - 1,000	Above 1,000	
Paddy Field	0 - 8	0.08	0.00	0.00	0.00	0.00	0.08
	8 - 15	0.37	0.00	0.00	0.00	0.00	0.37
	15 - 25	0.67	0.00	0.00	0.00	0.00	0.67
	25 - 40	1.21	27.78	0.00	0.00	0.00	1.21
	Above 40	2.03	0.00	0.00	0.00	0.00	2.03
Sub-Total		0.59	27.78	0.00	0.00	0.00	0.59
Home Settlement Area							
Housing Yard and Garden	0 - 8	10.22	33.58	58.46	0.00	0.00	26.09
	8 - 15	5.70	34.80	96.19	0.00	0.00	85.60
	15 - 25	10.62	39.58	181.86	303.31	0.00	188.04
	25 - 40	16.15	27.24	137.19	506.49	1046.57	383.37
	Above 40	11.09	41.30	134.46	876.00	1114.76	768.77
Sub-Total		10.14	34.17	116.64	568.88	1114.27	214.58
Upland Field	0 - 8	11.40	33.22	72.85	0.00	0.00	34.36
	8 - 15	5.54	36.03	108.92	279.82	0.00	96.37
	15 - 25	9.19	37.18	174.47	308.79	0.00	167.58
	25 - 40	14.48	27.25	163.67	400.09	1130.64	283.45
	Above 40	17.56	29.03	129.29	619.99	1195.70	487.92
Sub-Total		10.89	32.91	113.88	473.17	1192.68	121.86
Sub-Total		10.71	33.23	114.56	507.63	1125.35	147.12
Upland Field	0 - 8	7.86	32.07	63.79	0.00	0.00	19.89
	8 - 15	6.64	36.97	72.72	300.67	0.00	37.06
	15 - 25	7.81	32.02	95.57	345.75	0.00	59.83
	25 - 40	10.40	33.41	155.36	322.05	1198.63	110.19
	Above 40	15.25	28.38	146.97	374.38	1263.06	180.94
Sub-Total		9.92	32.47	118.47	367.59	1258.47	96.98
Forest/Orchard/Plantation	0 - 8	6.64	25.48	0.00	0.00	0.00	9.26
	8 - 15	6.77	37.36	62.88	0.00	0.00	37.11
	15 - 25	5.71	31.57	91.13	267.74	0.00	63.36
	25 - 40	6.41	39.18	146.88	293.83	0.00	104.90
	Above 40	11.49	34.47	155.24	303.82	0.00	180.04
Sub-Total		7.35	34.26	119.81	303.21	0.00	83.23
Dense Forest	0 - 8	3.56	0.00	0.00	0.00	0.00	3.56
	8 - 15	11.78	20.22	0.00	0.00	0.00	11.80
	15 - 25	5.74	30.98	0.00	0.00	0.00	25.36
	25 - 40	2.77	45.36	70.34	0.00	0.00	46.62
	Above 40	5.56	0.00	134.72	0.00	0.00	84.16
Sub-Total		6.37	33.02	112.63	0.00	0.00	48.98
State Forest							
Dense Forest	0 - 8	2.95	0.00	0.00	0.00	0.00	2.95
	8 - 15	8.89	20.65	0.00	0.00	0.00	8.96
	15 - 25	5.53	29.97	0.00	0.00	0.00	17.95
	25 - 40	2.64	43.38	67.29	0.00	0.00	36.75
	Above 40	5.02	0.00	116.45	0.00	0.00	59.38
Sub-Total		4.99	34.18	103.28	0.00	0.00	42.08
Other Land Use	0 - 8	3.09	21.19	0.00	0.00	0.00	3.13
	8 - 15	5.36	27.53	52.87	0.00	0.00	8.74
	15 - 25	2.88	32.37	62.28	401.87	0.00	13.51
	25 - 40	3.43	40.45	70.45	648.46	0.00	21.11
	Above 40	5.28	28.22	92.25	346.32	115.44	23.84
Sub-Total		4.62	34.38	86.51	575.36	115.44	20.66
Sub-Total		4.63	34.37	87.50	575.36	115.44	21.30
Others	0 - 8	0.87	48.84	73.34	511.29	0.00	2.85
	8 - 15	3.30	26.17	0.00	894.31	1305.23	10.06
	15 - 25	4.08	34.94	62.28	0.00	1978.17	21.71
	25 - 40	3.35	31.26	102.21	289.61	2000.00	31.76
	Above 40	8.81	45.64	132.47	349.47	2000.00	51.06
Sub-Total		3.77	35.75	114.23	365.19	1904.72	24.22
Grand-Total		4.74	33.06	114.71	409.53	1135.08	74.02

Table 2.2.44 Future Annual Average Soil Loss Classified by Sub-Basin

(unit : thousand ton)

Land Use	Slope (%)	Watershed								Total	
		Keduang	Tirtomoyo	Temon	Upper Solo	Alang	Ngunggahan	Wuryantoro	Remnant		
Paddy Field	0 - 8	0	0	0	0	0	0	0	0	0	1
	8 - 15	1	0	0	0	0	0	0	0	0	2
	15 - 25	2	0	0	0	0	0	0	0	0	3
	25 - 40	2	1	0	0	0	0	0	0	0	3
	Above 40	7	1	0	1	0	0	0	0	0	9
Sub-Total		12	3	0	2	1	1	1	0	0	18
Home Settlement Area											
Housing Yard and Garden	0 - 8	40	6	4	5	4	2	3	0	0	65
	8 - 15	94	16	5	11	4	2	3	1	1	139
	15 - 25	135	50	8	29	6	4	3	2	2	237
	25 - 40	146	121	10	61	8	5	3	4	4	358
	Above 40	440	205	7	81	16	11	4	3	3	766
Sub-Total		856	398	34	187	38	24	16	11	11	1,564
Upland Field	0 - 8	119	35	27	44	61	21	18	4	4	327
	8 - 15	203	51	19	50	36	15	18	8	8	400
	15 - 25	214	77	19	74	26	15	13	10	10	446
	25 - 40	179	122	16	89	23	12	9	7	7	458
	Above 40	400	161	10	106	29	23	8	5	5	742
Sub-Total		1,115	445	90	362	175	85	66	34	34	2,373
Sub-Total		1,971	843	125	550	214	109	82	45	45	3,937
Upland Field	0 - 8	38	12	13	21	47	7	10	4	4	152
	8 - 15	55	31	15	32	32	8	19	8	8	201
	15 - 25	86	89	23	94	34	18	21	19	19	385
	25 - 40	146	255	56	259	46	36	20	31	31	850
	Above 40	514	785	151	554	83	98	32	50	50	2,268
Sub-Total		840	1,173	259	961	243	167	102	111	111	3,856
Forest/Orchard/Plantation	0 - 8	13	4	3	3	1	1	2	1	1	28
	8 - 15	34	10	6	10	3	1	5	4	4	73
	15 - 25	51	29	9	31	5	4	8	9	9	144
	25 - 40	61	65	13	82	9	7	9	9	9	255
	Above 40	204	128	22	172	13	12	11	8	8	570
Sub-Total		363	235	52	298	31	25	35	31	31	1,071
Dense Forest	0 - 8	0	0	0	0	0	0	0	0	0	0
	8 - 15	0	0	0	0	0	0	0	0	0	0
	15 - 25	1	0	0	0	0	0	0	0	0	1
	25 - 40	2	0	0	0	0	0	0	0	0	3
	Above 40	8	0	0	0	0	0	0	0	0	9
Sub-Total		11	0	0	0	0	0	0	1	2	14
State Forest											
Dense Forest	0 - 8	0	0	0	0	0	0	0	0	0	0
	8 - 15	0	0	0	0	0	0	0	0	0	0
	15 - 25	0	0	0	0	0	0	0	0	0	1
	25 - 40	1	1	0	0	0	0	0	0	0	3
	Above 40	3	6	0	0	0	0	0	0	0	12
Sub-Total		4	8	0	0	0	0	0	0	4	16
Other Land Use	0 - 8	1	0	0	0	0	0	0	0	0	2
	8 - 15	1	1	0	1	1	1	0	0	0	5
	15 - 25	2	5	1	3	3	2	0	1	1	17
	25 - 40	6	13	3	16	7	4	0	2	2	52
	Above 40	35	46	11	52	17	15	0	4	4	180
Sub-Total		45	66	15	72	29	22	0	7	7	256
Sub-Total		49	74	15	72	29	22	0	12	12	272
Others	0 - 8	0	0	0	0	0	0	0	0	0	1
	8 - 15	0	0	0	0	0	1	0	0	0	2
	15 - 25	1	1	0	0	1	1	0	0	0	4
	25 - 40	1	2	0	2	2	1	0	0	0	7
	Above 40	2	4	1	5	3	3	0	1	1	19
Sub-Total		4	7	1	7	6	6	0	1	1	34
Grand-Total		3,250	2,335	453	1,890	523	329	220	201	201	9,202

Table 2.2.45 Future Annual Average Soil Loss/ha Classified by Sub-Basin

(unit : ton per hectare)

Land Use	Slope (%)	Watershed								Total
		Keduang	Tirtomoyo	Temon	Upper Solo	Alang	Ngunggan	Wuryantoro	Remnant	
Paddy Field	0 - 8	0.11	0.10	0.07	0.06	0.07	0.05	0.11	0.10	0.08
	8 - 15	0.38	0.40	0.34	0.34	0.28	0.28	0.41	0.40	0.37
	15 - 25	0.73	0.67	0.65	0.62	0.48	0.37	0.65	0.71	0.67
	25 - 40	1.39	1.15	1.16	1.06	0.80	0.57	1.03	1.09	1.21
	Above 40	2.37	1.63	1.91	1.59	1.03	0.96	1.40	1.14	2.03
Sub-Total		0.91	0.52	0.26	0.42	0.20	0.21	0.39	0.45	0.59
Home Settlement Area										
Housing Yard and Garden	0 - 8	30.88	26.94	22.33	18.16	15.17	16.98	28.45	30.12	26.09
	8 - 15	92.46	90.41	80.45	73.43	44.12	53.03	84.92	87.39	85.60
	15 - 25	206.91	194.50	188.50	173.24	89.41	95.74	153.33	153.69	188.04
	25 - 40	424.41	406.66	390.97	372.99	172.61	191.41	278.58	189.77	383.37
	Above 40	938.13	716.08	720.50	614.94	319.82	430.75	350.37	194.73	768.77
Sub-Total		225.44	322.00	106.48	206.83	73.21	100.87	85.49	135.08	214.58
Upland Field	0 - 8	39.83	40.84	35.95	28.10	29.03	29.64	35.80	39.10	34.36
	8 - 15	104.92	107.35	92.88	85.97	68.77	78.26	107.83	111.63	96.37
	15 - 25	188.20	174.78	166.42	154.31	115.70	104.79	167.56	172.57	167.58
	25 - 40	325.92	288.65	302.77	263.25	198.76	182.03	262.51	217.34	283.43
	Above 40	609.51	434.22	526.51	404.27	303.90	290.19	412.46	264.78	487.92
Sub-Total		153.60	174.22	79.65	112.62	57.36	72.42	81.70	124.13	121.86
Sub-Total		178.26	222.36	85.60	133.30	59.67	77.29	82.42	126.55	147.11
Upland Field	0 - 8	27.43	20.62	26.20	20.64	15.08	15.49	22.65	27.03	19.89
	8 - 15	44.52	39.99	45.12	34.42	26.48	22.59	48.14	48.73	37.05
	15 - 25	64.59	66.16	80.05	63.99	35.24	38.57	65.62	80.99	59.81
	25 - 40	94.62	119.92	173.86	132.89	56.06	80.33	85.31	119.19	110.18
	Above 40	155.87	189.89	317.32	222.03	94.54	177.23	111.41	123.27	180.93
Sub-Total		95.32	130.59	133.63	122.02	34.61	73.28	61.11	93.22	96.97
Forest/Orchard/Plantation	0 - 8	12.48	9.77	7.86	7.29	4.63	3.80	12.95	13.25	9.26
	8 - 15	44.79	37.63	40.36	30.37	13.95	16.16	49.72	43.62	37.11
	15 - 25	81.32	67.00	75.98	59.31	18.49	29.55	83.98	74.49	63.36
	25 - 40	137.95	117.13	139.86	109.12	32.08	47.98	122.15	103.46	104.90
	Above 40	236.16	181.71	215.99	181.43	52.29	90.65	152.55	86.64	180.04
Sub-Total		96.99	101.78	65.51	100.72	24.24	31.13	73.28	63.73	83.23
Dense Forest	0 - 8	3.66	2.52	0.00	0.00	0.00	0.00	3.24	4.52	3.56
	8 - 15	11.79	10.60	0.00	0.00	0.00	0.00	12.12	11.28	11.80
	15 - 25	25.10	14.09	0.00	0.00	0.00	0.00	24.69	28.29	25.36
	25 - 40	48.18	47.37	0.00	56.55	0.00	0.00	27.10	52.12	46.62
	Above 40	92.30	109.97	0.00	95.94	0.00	0.00	36.82	58.05	84.16
Sub-Total		55.66	42.82	0.00	69.68	0.00	0.00	20.13	43.85	48.98
State Forest										
Dense Forest	0 - 8	2.88	3.60	0.00	0.00	0.00	0.00	0.00	2.86	2.95
	8 - 15	8.85	10.82	0.00	0.00	0.00	0.00	0.00	8.36	8.96
	15 - 25	15.87	23.32	0.00	13.65	0.00	0.00	0.00	18.51	17.93
	25 - 40	27.16	53.80	0.00	15.88	0.00	0.00	0.00	30.46	36.71
	Above 40	43.43	101.06	0.00	48.49	0.00	0.00	0.00	38.79	59.37
Sub-Total		26.05	77.21	0.00	20.21	0.00	0.00	33.05	42.07	
Other Land Use	0 - 8	3.00	3.88	3.23	3.53	2.97	2.44	7.25	5.27	3.13
	8 - 15	7.11	10.98	9.61	10.62	7.61	8.38	18.93	12.30	8.74
	15 - 25	6.10	19.42	16.14	22.13	12.22	11.16	5.56	19.30	13.51
	25 - 40	8.30	24.13	27.86	43.66	19.99	18.70	2.21	24.04	21.11
	Above 40	9.94	32.59	28.12	60.37	28.71	25.69	3.56	20.44	23.86
Sub-Total		9.08	27.27	26.39	48.97	19.92	18.93	4.41	20.15	20.66
Sub-Total		9.58	29.30	26.39	48.96	19.92	18.93	4.41	23.56	21.31
Others	0 - 8	3.19	1.15	0.20	7.31	1.04	5.41	0.80	5.01	2.85
	8 - 15	9.39	7.64	0.33	3.03	6.97	135.46	0.00	19.24	10.06
	15 - 25	16.60	17.81	5.34	8.52	15.30	675.17	0.14	27.47	21.71
	25 - 40	19.26	27.44	38.19	29.42	31.86	495.70	0.00	39.43	31.76
	Above 40	22.63	37.19	74.41	54.22	59.27	462.38	0.00	112.81	51.06
Sub-Total		12.84	20.05	16.16	27.14	24.06	120.78	0.70	89.66	24.22
Grand-Total		77.21	101.25	72.30	91.94	30.90	39.98	49.85	72.63	74.01

Table 3.4.2 Farm Land Ownership in The Selected Villages (2/2)

Desa	No. of Households	Distribution of Farm Households by Holding Size of Food Crops Field (Lahan Pertanian Pangan)						Distribution of Farm Households by Holding Size of Tree Crops Field (Lahan Perkebunan)						Forest Area in Village (ha)													
		< 0.5 ha		0.5 - 1.0 ha		> 1.0 ha		< 0.5 ha		0.5 - 1.0 ha		> 1.0 ha		State Land 1/		Peoples Forest 2/		State Forestry		Total (ha)							
		(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)								
Kec. Ngadirojo	49 Gedong	1,165	299	26	834	74	-	-	-	-	-	-	-	-	-	-	-	-	-	0							
	50 Gemawang	299	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	51 Kerjo Kidul	1,278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	52 Kerjo Lor	2,486	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	53 Ngadirojo Kidul	1,942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	54 Pondok	1,244	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	55 Ngadipiro	314	75	16	0	0	125	27	256	56	456	0	0	0	0	0	0	0	0	0							
	56 Jatnom	698	78	33	125	53	25	11	10	4	238	0	0	0	0	0	0	0	0	0							
	57 Kayuloko	219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	58 Kebonagung	569	139	25	225	41	185	34	0	0	549	0	0	0	0	0	0	0	0	0							
Kec. Sidoharjo	59 Kedungpuit	996	781	68	316	28	41	4	5	0.4	1,143	0	0	0	0	0	0	0	0	0							
	60 Mojoreno	802	328	41	336	42	19	2	119	15	802	0	0	0	0	0	0	0	0	0							
	61 Ngabeyan	483	83	13	367	56	96	15	109	17	655	154	77	46	23	0	0	0	0	104							
	62 Sembuhan	762	23	3	120	16	525	71	71	10	739	0	0	0	0	0	0	0	0	503							
	63 Sempukerep	844	128	15	345	39	350	40	55	6	878	0	0	0	0	0	0	0	0	135							
	64 Sidoharjo	934	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	65 Tempursari	680	450	66	50	7	125	18	55	8	680	0	0	0	0	0	0	0	0	0							
	66 Tremes	875	264	37	236	33	196	28	12	2	708	0	0	0	0	0	0	0	0	0							
	67 Widoto	643	106	-	261	-	114	-	185	-	-	-	-	-	-	-	-	-	-	-	0						
	68 Bulusari	862	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Kec. Slogohimo	69 Cuman	680	425	34	695	56	125	10	0	1,245	0	0	0	0	0	0	0	0	0	0							
	70 Karang	746	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	71 Klunggen	264	371	-	257	-	4	-	3	-	-	0	0	0	0	0	0	0	0	0							
	72 Made	587	196	24	252	31	337	41	29	4	814	0	0	278	63	157	35	8	2	443							
	73 Pandan	747	25	8	185	58	85	27	25	8	320	0	0	0	0	0	0	0	0	0							
	74 Randusari	694	120	16	628	83	10	1	2	0	760	0	0	0	0	0	0	0	0	0							
	75 Sambirejo	637	103	16	473	73	48	7	25	4	649	0	0	0	0	0	0	0	0	232							
	76 Sedayu	747	14	2	423	58	291	40	6	1	734	14	2	423	58	291	40	6	1	734							
	77 Setren	601	20	3	242	37	200	31	190	29	632	0	0	400	63	100	16	132	21	632							
	78 Slogohimo	738	41	16	114	44	101	39	6	2	262	0	0	0	0	0	0	0	0	0							
Kec. Sokoboyo	79 Soco	722	228	33	55	8	407	59	0	690	0	0	0	0	0	0	0	0	0	0							
	80 Sokoboyo	727	71	10	189	27	316	45	127	18	703	300	43	161	23	162	23	80	11	703							
	81 Watusomo	500	33	6	140	26	340	64	20	4	533	0	0	0	0	0	0	0	0	46							
	82 Pokoh Kidul	1,077	483	41	280	24	311	26	106	9	1,180	520	97	14	3	0	0	0	0	534							
Selected Villages Total 5/		65,787	12,311	28	17,765	41	11,311	26	3,676	8	43,543	4,900	45	3,932	36	2,108	19	545	5	10,826	2,853	68	684	16	681	16	4,219

1/ Tanah negara 2/ Milik sda/masyarakat adat 3/ Kecamatan: Nguntoramadi 4/ Kecamatan: Wonogiri 5/ Not including villages with no data

Source: Kecamatan in Figures, 2004, BPS Wonogiri & Potensi Desa, Kecamatan Jatisrono, 2005, PMD

Table 3.4.6 Paddy Field in the Selected Villages in 2004

Kecamatan	Desa	Irrigated Paddy Field		Rainfed Paddy Field		Total (ha)	
		(ha)	(%)	(ha)	(%)		
1. Girimarto	1 Cendi	114	100	0		114	
	2 Doho	154	100	0		154	
	3 Gewangan	118	100	0		118	
	4 Sanan	126	100	0		126	
	5 Selorejo	146	100	0		146	
	6 Semagar	162	100	0		162	
	7 Girimarto	132	100	0		132	
	8 Jatirejo	106	0	0	0	106	
	9 Nungkulan	167	0	0	0	167	
	10 Sidokarto	162	100	0	0	162	
	11 Tambakmerang	155	100	0		155	
	12 Waleng	138	100	0		138	
2. Jatipurno	13 Balepanjang	43	96	2	4	45	
	14 Girimulyo	54	98	1	2	55	
	15 Giriyo	155	97	4	3	159	
	16 Jatipurno	70	95	4	5	74	
	17 Jatipurwo	104	99	1	1	105	
	18 Jeporo	146	99	2	1	148	
	19 Kembang	34	97	1	3	35	
	20 Kopen	183	98	4	2	187	
	21 Mangunharjo	122	98	3	2	125	
	22 Slogoretno	50	94	3	6	53	
	23 Tawangrejo	140	99	1	1	141	
	3. Jatiroto	24 Dawungan	97	90	11	10	108
25 Duren		111	100	0		111	
26 Guno		82	100	0		82	
27 Jatirejo		151	92	13	8	164	
28 Jatiroto		102	94	7	6	109	
29 Mojopuro		96	100	0		96	
30 Ngele		54	100	0		54	
31 Pengkol		131	100	0		131	
32 Pingkuk		95	81	22	19	117	
33 Sangrong		66	73	24	27	90	
4. Jatisrono		34 Gondangsari	47	76	15	24	62
		35 Gunungsari	65	76	20	24	85
	36 Jatisari	70	91	7	9	77	
	37 Jatisrono	97	100	0		97	
	38 Ngrompak	82	85	14	15	96	
	39 Pandeyan	96	100	0		96	
	40 Pelem	74	94	5	6	79	
	41 Pule	28	64	16	36	44	
	42 Rejosari	44	63	26	37	70	
	43 Semen	71	82	16	18	87	
	44 Sumberejo	47	92	4	8	51	
	45 Tanggulangin	104	100	0		104	
46 Tanjungsari	65	66	34	34	99		
47 Tasikhargo	118	100	0		118		
48 Watangsono	60	91	6	9	66		
5. Ngadirojo	49 Gedong	140	78	40	22	180	
	50 Gemawang	131	75	43	25	174	
	51 Kerjo Kidul	186	83	37	17	223	
	52 Kerjo Lor	194	85	34	15	228	
	53 Ngadirojo Kidul	238	88	31	12	269	
	54 Pondok	219	85	40	15	259	
6. Nguntoronadi	55 Ngadipiro	0	0	134	100	134	
7. Sidoharjo	56 Jatinom	142	74	50	26	192	
	57 Kayuloko	116	100	0	0	116	
	58 Kebonagung	24	45	29	55	53	
	59 Kedunggupit	172	100	0	0	172	
	60 Widoro	0	0	0	0	0	
	61 Mojoreno	56	42	78	58	134	
	62 Ngabeyan	61	49	64	51	125	
	63 Sembuhan	8	5	153	95	161	
	64 Sempukerep	28	13	196	88	224	
	65 Sidoharjo	0	0	0	0	0	
	66 Tempursari	222	56	172	44	394	
	67 Tremes	154	57	114	43	268	
8. Slogohimo	68 Bulusari	80	100	0	0	80	
	69 Gunan	79	100	0	0	79	
	70 Karang	70	100	0	0	70	
	71 Klunggen	115	51	110	0	225	
	72 Made	71	100	0		71	
	73 Pandan	115	100	0		115	
	74 Randusari	108	100	0		108	
	75 Sambirejo	40	45	49	55	89	
	76 Sedayu	75	100	0		75	
	77 Setren	65	100	0		65	
	78 Slogohimo	60	100	0		60	
	79 Soco	90	100	0		90	
80 Sokoboyo	65	100	0		65		
81 Watusomo	72	100	0		72		
9. Wonogiri	82 Pokoh Kidul	9	82	2	18	11	
Selected Villages Total 1/		8,039	83	1,642	17	9,681	
Kecamatans in Wonogiri Catchment 2/		20,371	74	7,130	26	27,501	
Kab. Wonogiri		23,391	76	7,322	24	30,913	

1/: Not including villages with no data

2/: Kecamatan located in Wonogiri catchment area

Source: Kecamatan in Figures, 2003 or 2004, BPS Wonogiri, Kabupaten in Figures, 2004, BPS Wonogiri

Table 3.4.9 Monthly Cropped Area Seasonal Cropping in Dry Farm Land in Major Keduang Kecamatan (2/2)

Kecamatan	Crops	Crop Year 2002/2003												Crop Year 2003/2004												Crop Year 2004/05					Average of Crop Year 02/03 MTIII ~ 04/05 MT II		
		2002/03 MP II			2002/03 MP III			2003/04 MP II			2003/04 MP III			2004/05 MP II			2004/05 MP III		2004/05 MP II	MP III	MP II-III												
		Feb	Mar	Apr	May	June	July	Aug	Sep	Feb	Mar	Apr	May	June	July	Aug	Sep	Feb	Mar	Apr	May	MP II	MP III	MP II-III									
5. Jatisono	Padi Ladang	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Jagung	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Ubi Kayu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Kacang Tanah	-	-	-	-	-	-	-	642	-	-	-	-	-	-	-	-	-	442	-	-	361	-										
	Kedelai	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Kacang Hijau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Ubi Jalar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Monthly Total (ha)	0	0	0	0	0	0	0	642	0	0	0	0	0	0	0	0	0	442	0	0	361	0										
	Seasonal Total (ha)																								642								
	Dry Farm Land (ha)																								642								
Cropping Intensity (%)																								0									
6. Jatipurno	Padi Ladang	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
	Jagung	-	-	-	-	-	-	-	132	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Ubi Kayu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Kacang Tanah	-	-	-	-	-	-	-	107	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Kedelai	-	-	-	-	-	-	-	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Kacang Hijau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Ubi Jalar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Monthly Total (ha)	-	-	-	-	-	-	-	132	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Seasonal Total (ha)																								132								
	Dry Farm Land (ha)																								132								
Cropping Intensity (%)																								0									
7. Girtmarto	Padi Ladang	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
	Jagung	-	-	-	-	-	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Ubi Kayu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Kacang Tanah	-	-	-	-	-	-	-	114	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Kedelai	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Kacang Hijau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Ubi Jalar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Monthly Total (ha)	-	-	-	-	-	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Seasonal Total (ha)																								50								
	Dry Farm Land (ha)																								50								
Cropping Intensity (%)																								0									
Kecamatan in Sub-DAS Keduang Total	Padi Ladang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	Jagung	0	0	0	0	0	0	0	319	0	0	0	0	0	0	0	0	0	0	0	0	0											
	Ubi Kayu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	Kacang Tanah	0	7,333	67	0	13	0	0	3,692	462	0	0	7	0	0	0	0	5,584	2,638	442	0	8,416											
	Kedelai	0	0	0	0	0	0	0	77	9	0	0	0	0	0	0	0	24	163	0	0	124											
	Kacang Hijau	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	Sorghum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	Ubi Jalar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
	Monthly Total (ha)	0	7,876	67	0	15	0	0	9,088	481	0	0	7	0	0	0	0	5,619	2,922	642	0	9,183											
	Seasonal Total (ha)																								9,569								
	Dry Farm Land (ha)																								9,569								
Cropping Intensity (%)																								0									
DAS Wonogiri Total	Cropped Area (ha)																								42								
	Crop Intensity (%)																								39								
	Cropped Area (ha)																								39								
	Crop Intensity (%)																								39								
Kabupaten Total	Cropped Area (ha)																								37								
	Crop Intensity (%)																								36								
	Cropped Area (ha)																								36								
	Crop Intensity (%)																								36								

Source: Monthly planted area in dry farmland in 2003, 2004 & 2005 BPS Wonogiri

Table 3.4.15 Agriculture Support Institutions by Kecamatan in the Project Area in 2004^{1/}

Kecamatan	Former BPP	Extension Staffs (in number)				No. of Livestock & Fishery Sub-sector Extension Staffs			No. of Forestry Sub-sector Extension Staffs			Seed & Nursery Production & Supply			RMU 3/		
		No. of Crop Sub-sector Extension Staffs 2/		No. of Livestock & Fishery Sub-sector Extension Staffs		Livestock	Inseminator	Fishery	Total	Coordinator	PKL	Total	BBI	BBP		BPSB	P4S
		Coordinator	PPLs 2/	Total	Total												
1 Nguntoronadi	1	1	4	5	1	1		2	1		1					17	
2 Wonogiri	1	1	4	5	1	1		2	1	2	3		1 (horticulture)			20	
3 Ngadirojo	1	1	5	6	1	1	1	3	1	1	2					22	
4 Sidoharjo	1	1	3	4	1	1	2	3	1	1	2		1 (palawija)			19	
5 Jatiro	1	1	3	4	1	1	1	2	1	1	2					16	
6 Slogohimo	1	1	4	5	1	1	1	2	2	1	3					24	
7 Jatisrono	1	1	3	4	1	1	1	2	1	1	2		1 (palawija)			34	
8 Jatipurno	1	1	4	5	1	1	1	2	2	1	2				1	26	
9 Girimarto	1	1	4	5	1	1	1	2	2	1	3					37	
Total in Project Area 4/	9	9	34	43	9	7	4	20	8	12	20		3		1	215	
Total in DAS Wonogiri 5/	20	20	71	91	18	14	14	46	19	19	38		-	6	-	418	
Kabupaten Total	25	25	96	121	24	18	16	58	29	22	51		-	6	2	482	
Central Java Province													3		Kab. Semarang		

Kecamatan	Farm Input Supply			KUD			Trade Amount (Rp. Million)			Credit Institutions 6/			Market			Processing Facilities (other than rice mill)	
	SHS	PT Pertanian	PT Pusri distributor	Inputs Kios	No.	Members	BRI	BKK	BPR	General	Village	Animal	Other Banks	General	Village		Animal
1 Nguntoronadi				20	1	1,736			1					1	3		
2 Wonogiri				15	1	3,045			4					3	3		cashew nut 2
3 Ngadirojo				11	1	8,776			2					1	3		
4 Sidoharjo				4	1	8,030			1					1	4		1
5 Jatiro				12	1	5,576			1					1	3		
6 Slogohimo				27	1	8,916			1					1	4		1
7 Jatisrono				6	1	4,440			2					1	3		1
8 Jatipurno				11	1	5,821			1					1	3		
9 Girimarto				9	1	9,178			2					1	4		
Total in Project Area 4/				115	9	55,518			15	7	3			11	30		3
Total in DAS Wonogiri 5/				208	20	92,402			26	17	5			21	51		6
Kabupaten Total				289	24	107,597			30	20	6			25	65		8
Central Java Province																	

1/ Wonogiri kecamatans located in the Project Area 2/ Include 15 PPLs & 5 Coordinators & employed in Kabupaten Agriculture Services Office

3/ RMU --- Rice Mill Unit 4/ Total of staffs deployed in kecamatans located in the Project Area 5/ Total of Wonogiri kecamatans located in DAS Wonogiri

6/ Bank Rakyat Indonesia (BRI); Bank Kredit Kecamatan (BKK); Bank Perkreditan Rakyat (BPR)

Source: Wonogiri in Figures, 2003, BPS & Kabupaten Agriculture Services Office, Wonogiri

Tabel 3.5.1 Inventory on Terrace Works Implemented under Project Upper Solo (Wonogiri) Watershed Development Project (IBRD)

Kecamatan/Desa	Area of Improved Terrace (ha)					Total
	88/89	89/90	90/91	91/92	92/93	
1. Wonogiri						
2) Pokoh Kidul	78.3		112.7			191.0
Sub-total	78.3	0.0	112.7		0.0	191.0
2. Ngadirojo						
2) Ngadirojo Kdl.			20.5	51.3		71.8
Sub-total		0.0	20.5	51.3	0.0	71.8
3. Sidoharjo						
1) Tempursari		103.8	76.3			180.1
2) Sembuhan		68.6	85.6	7.0		161.2
3) Sempukerep	31.0	59.3	148.8	70.3	43.9	353.3
4) Widoro	64.4			26.7		91.1
5) Tremes				19.0		19.0
6) Kebon Agung	24.5	49.6		9.7		83.8
7) Jatinom			39.7			39.7
8) Ngabeyan				65.0		65.0
9) Mojoreno					4.6	4.6
Sub-total	119.9	281.3	350.4	197.7	48.5	997.8
4. Girimarto						
1) Tambak Merang		26.0		43.3		69.3
2) Doho			9.8	23.3	51.1	84.2
3) Senagar Duwur	10.1	48.9	10.9	76.4		146.3
4) Sanan	11.0	123.1		33.3		167.4
5) Selorejo			50.0	115.3		165.3
6) Girimarto		20.6	47.3	6.9		74.8
7) Waleng			39.1	7.9	96.9	143.9
10) Cendi		12.4		58.6		71.0
11) Jatirejo			71.9	71.9	44.9	188.7
12) Nungkulan		6.0				6.0
Sub-total	21.1	237.0	229.0	436.9	192.9	1,116.9
5. Jatisrono						
1) Tanggulangin				7.8		7.8
2) Ngrompak	11.3		51.8	103.8		166.9
3) Pule				12.7		12.7
4) Palem			17.2	13.6		30.8
5) Semen			10.2			10.2
6) Rejosari	18.0	30.6			39.4	88.0
7) Gongang sari	10.0	7.7				17.7
9) Jatisrono				18.7		18.7
10) Jatisari		15.7				15.7
11) Pandeyan	14.5	83.3		16.8		114.6
12) Watangsono	36.8	17.7		22.5		77.0
13) Tasikhargo	32.0	32.0		11.8		75.8
14) Sumberejo	24.5			24.4		48.9
15) Tanjung Sari				12.5		12.5
16) Gunungasri		16.6				16.6
Sub-total	147.1	203.6	91.9	231.9	39.4	713.9
6. Jatiroto						
1) Jatiroto	10.2	14.5				24.7
2) Sanggrong			26.6			26.6
3) Dawungan		12.1		67.3	14.9	94.3
4) Ngelo		23.8		58.6		82.4
6) Mojopuro	12.0		59.5	43.2		114.7
7) Duren	11.3	25.6	10.3			47.2
8) Pingkuk	24.6	20.0		51.9	29.0	125.5
11) Jatirejo	18.4	23.1	26.2	47.9		115.6
12) Guno				46.9		46.9
13) Pengkol					31.1	31.1
Sub-total	76.5	119.1	122.6	315.8	75.0	709.0
7. Slogohimo						
1) Klunggen				4.6		4.6
2) Bulusari				16.0		16.0
3) Sokoboyo	25.8	16.9	53.2	51.6		147.5
4) Karang				64.7		64.7
5) Sedayu				35.0		35.0
6) Made	16.0	26.4	12.6	21.3		76.3
8) Randusari			12.8	4.0		16.8
9) Sitren			55.6	45.8	12.9	114.3
10) Pandan					93.1	93.1
Sub-total	41.8	43.3	134.2	243.0	106.0	568.3
8. Jatipurno						
1) Balepanjang			62.2	24.4		86.6
2) Tawangrejo		29.0	15.6			44.6
3) Kembang				188.8		188.8
4) Jatipurno			13.3	11.4		24.7
5) Mangunharjo				50.1	106.6	156.7
7) Jeporo	10.6		84.9		102.4	197.9
8) Slogoretno		40.6	25.2			65.8
9) Jatipuruwo				35.0		35.0
10) Girimulyo		47.6		20.0		67.6
11) Giriyo					51.8	51.8
Sub-total	10.6	117.2	201.2	329.7	260.8	919.5
Total	495.3	1,001.5	1,262.5	1,806.3	722.6	5,288.2

Source: files of Pemerintah Kabupaten Daerah Tingkat II Wonogiri Sekretariat Wilayah/Daerah

Table 3.5.2 Inventory on Physical Works Implemented under Project Upper Solo (wonogiri) Watershed Development Project/IBRD (1/2)

Kecamatan/Desa	Small gully plug (PJK; unit)		Gully head structure (PUJ; unit)		Big gully plug (DPN; unit)		Check dam (DPI; unit)		Slopping grass (SL; m2)		Road side protection (RS; m2)		River bank protection (SB; m2)									
	88/89	89/90	90/91	91/92	88/89	89/90	90/91	91/92	88/89	89/90	90/91	91/92	88/89	89/90	90/91	91/92	Total					
1. Wonogiri	0	14	0	14	0	6	0	1	0	0	0	0	0	0	0	0	0					
2) Pokoh Kihal	14	0	0	14	0	6	0	1	0	0	0	0	0	0	0	0	0					
Sub-total	14	0	0	14	0	6	0	1	0	0	0	0	0	0	0	0	0					
2. Ngadirojo	2	13	2	14	1	1	1	1	0	0	0	0	0	0	0	0	0					
1) Pondok	2	13	2	14	1	1	1	1	0	0	0	0	0	0	0	0	0					
2) Ngadirojo Kidl.	1	32	1	34	1	1	0	0	0	0	0	0	0	0	0	0	0					
3) Kerjo Lor	14	12	13	39	7	5	13	3	1	2	3	4,101	436	8,050	0	0	0					
4) Kerjo Kihal	9	6	13	28	2	6	6	2	1	2	1	1,171	269	0	0	0	0					
6) Gedong	6	7	24	33	2	2	4	2	1	2	1	538	0	0	240	240	420					
7) Gemawang	6	7	13	26	2	2	4	2	2	2	0	0	0	0	200	220	420					
Sub-total	30	47	13	65	15	27	27	10	2	6	705	8,050	0	4,101	12,856	0	1,709	200	460	0	660	
3. Sidoarjo	18	8	18	36	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
1) Tempusani	18	8	18	36	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
2) Sembukan	8	2	15	22	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
3) Sempukerep	13	39	9	48	5	6	11	7	1	7	7,281	1,301	0	0	0	0	0	0	0	0	0	
4) Widoro	4	4	4	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5) Sidoarjo	6	6	6	18	3	3	3	1	1	1	2,121	0	0	0	0	0	0	0	0	0	0	
6) Tremes	8	14	4	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7) Kayuloko	5	8	13	21	1	1	1	3	3	0	0	0	2,209	4,100	0	0	0	0	0	0	0	
8) Mojoreno	4	4	4	12	0	0	0	0	0	0	0	0	2,500	4,100	0	0	0	0	0	0	0	
9) Kebon Agung	12	13	25	40	2	4	2	4	3	1	0	0	0	0	0	0	0	0	0	0	0	
10) Jalmom	4	2	17	23	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
11) Ngabayan	4	2	6	12	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	
12) Keudegapit	5	1	6	12	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sub-total	77	0	46	55	178	9	13	9	31	15	0	4	14,111	0	4,940	4,100	23,151	0	0	0	0	0
4. Girimarto	28	13	13	26	9	3	3	6	9	4	4	1	0	0	0	0	0	0	0	0	0	
2) Tambak Merang	28	13	13	26	9	3	3	6	9	4	4	1	0	0	0	0	0	0	0	0	0	
3) Doho	4	4	4	12	5	5	5	6	6	6	6	6	0	0	0	0	0	0	0	0	0	
4) Senagar Duwur	29	6	6	35	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
5) Sanan	4	7	11	22	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
6) Selerejo	3	13	16	32	1	2	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	
8) Waleng	7	7	7	21	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	
9) Sidakarto	8	8	8	24	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
10) Gemawang	8	8	8	24	6	6	6	6	3	3	3	3	0	0	0	0	0	0	0	0	0	
11) Nungkulen	4	4	4	12	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	
13) Jendi	3	5	5	13	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	
14) Girimarto	1	9	9	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15) Jahrejo	0	83	32	82	137	0	20	6	13	39	0	16	1	2	19	0	0	0	0	0	0	
Sub-total	0	83	32	82	137	0	20	6	13	39	0	16	1	2	19	0	0	0	0	0	0	
Total	111	133	133	266	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133

Table 3.5.2 Inventory on Physical Works Implemented under Project Upper Solo (wonogiri) Watershed Development Project/IBRD (2/2)

Kecamatan/Dea	Small gully plug (PJK, unit)		Gully head structure (PJK, unit)		Big gully plug (DPK, unit)		Check dam (DPE, unit)		Sloping grass (SL, m2)		Road side protection (RS, m2)		River bank protection (SE, m2)	
	88/89	89/90	88/89	89/90	88/89	89/90	88/89	89/90	88/89	89/90	88/89	89/90	88/89	89/90
5. Jatisrono	5	5	5	2	0	0	0	0	0	0	0	0	0	0
1) Tasgulangin	11	11	2	2	0	0	1	0	0	0	0	0	0	0
2) Ngrompak	2	2	0	0	0	0	0	0	0	0	0	0	0	0
3) Pule	1	1	0	0	0	0	0	0	0	0	0	0	0	0
4) Palembang	3	3	0	0	0	0	0	0	0	0	0	0	0	0
5) Semen	9	9	0	0	2	2	0	0	1,963	1,963	0	0	0	0
7) Rejosari	2	2	1	1	1	1	0	0	3,090	3,090	0	0	0	0
8) Gondangasari	0	0	1	1	1	1	0	0	650	650	0	0	0	0
9) Clurungasari	15	15	4	4	0	0	0	0	1,365	1,365	0	0	0	0
11) Jatisrono	4	4	1	1	2	2	0	0	900	900	0	0	0	0
12) Jatsari	8	8	2	2	3	3	0	0	900	900	895	895	0	0
13) Pandayan	7	7	2	2	1	1	0	0	2,179	2,179	0	0	0	0
14) Watangsono	15	15	3	3	3	3	0	0	0	0	0	0	0	0
15) Taschargo	8	8	1	1	4	4	1	1	1,665	1,665	1,055	1,055	0	0
16) Sumberejo	21	21	4	4	2	2	2	2	415	10,470	1,950	1,950	0	0
Sub-total	55	27	17	62	11	4	2	13	30	12	1	2	16	1
6. Jatroto	9	16	1	1	2	2	0	0	272	510	1,000	1,000	0	0
1) Jabroto	7	7	1	1	1	1	0	0	0	0	0	0	0	0
2) Sangsrong	4	4	1	1	3	3	1	1	0	0	0	0	0	0
3) Dawangan	8	8	2	2	3	3	0	0	3,670	3,670	580	580	0	0
4) Ngelo	2	2	0	0	2	2	0	0	0	0	0	0	0	0
6) Mojopuro	8	8	3	3	3	3	0	0	0	0	0	0	0	0
8) Pingtuk	2	2	0	0	2	2	0	0	0	0	0	0	0	0
9) Pengkol	4	4	1	1	0	0	0	0	3,725	3,725	0	0	58	58
12) Jahrejo	13	39	18	4	74	3	5	0	13	7,905	2	580	1,580	58
Sub-total	14	14	0	0	0	0	0	0	0	1,400	0	0	0	0
7. Slogohimo	3	5	1	2	1	3	1	1	0	0	0	0	0	0
1) Gurun	2	2	1	1	1	1	0	0	0	0	0	0	0	0
2) Soco	1	1	1	1	2	2	2	2	620	620	2,300	2,300	0	0
3) Klunggen	5	5	1	1	0	0	0	0	0	0	1,100	1,100	0	0
4) Sambirejo	12	12	2	2	2	2	1	1	3,630	3,630	1,100	1,100	0	0
9) Sakoboyo	12	12	2	2	2	2	0	0	950	950	0	0	0	0
10) Karang	12	12	0	0	1	1	1	1	0	0	0	0	0	0
11) Sedyu	6	6	1	1	1	1	0	0	6,990	6,990	0	0	0	0
12) Slogohimo	9	9	4	4	2	2	3	3	0	0	0	0	0	0
13) Made	2	2	1	1	1	1	0	0	140	140	1,150	1,150	0	0
14) Pundan	6	6	0	0	0	0	0	0	0	0	0	0	0	0
15) Watuono	6	6	1	1	5	5	10	10	140	6,000	6,990	0	0	0
Sub-total	6	49	22	0	77	1	5	8	0	14	5	10	1	0
8. Jatipurno	3	3	2	2	0	0	0	0	0	0	0	0	0	0
1) Belepanjiang	6	6	1	1	1	1	0	0	0	0	0	0	0	0
2) Tawangrejo	4	4	2	2	4	4	2	2	0	0	0	0	0	0
3) Kembang	11	11	7	7	18	18	2	2	0	0	0	0	0	0
4) Jaipurno	4	4	1	1	1	1	0	0	0	0	0	0	0	0
5) Mangunharjo	30	30	6	6	36	36	2	2	0	0	1,450	1,450	0	0
6) Kopen	6	6	6	6	2	2	1	1	0	0	3,820	3,820	0	0
7) Joporo	16	16	3	3	19	19	1	1	0	0	0	0	0	0
8) Ciryoso	64	36	100	0	0	0	15	8	23	0	1,450	3,820	0	0
Sub-total	181	259	212	304	956	25	49	51	58	183	41	39	12	9
Total	181	259	212	304	956	25	49	51	58	183	41	39	12	9
	109,121	26,703	109,121	0	3,500	0	22,079	7,525	0	29,604	391	910	0	1,301

Source* Office files of Dinas Lingkungan Hidup, Kehutanan, and Pertambangan Kabupaten Wonogiri

Table 3.6.2 Present Annual Average Soil Loss for Keduang Watershed Conservation for All Villages (2/2)

No	Desa	Keramasan	Village Area (H)	Annual Rainfall (mm)		Annual Rainfall (mm)	Annual Rainfall (mm)	Annual Rainfall (mm)	Land Use		Total	Soil Loss (Ton)	Soil Loss (Ton)	Soil Loss (Ton)	Soil Loss (Ton)	Sedimentation			Sedimentation (Ton)	Sedimentation (Ton)			Sedimentation (Ton)	Sedimentation (Ton)	
				Annual Rainfall (mm)					Sedimentation (Ton)	Sedimentation (Ton)						Sedimentation (Ton)	Sedimentation (Ton)			Sedimentation (Ton)					
				Annual Rainfall (mm)	Annual Rainfall (mm)												Soil Loss (Ton)	Soil Loss (Ton)		Soil Loss (Ton)	Soil Loss (Ton)	Soil Loss (Ton)			Soil Loss (Ton)
1	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	
2	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
3	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
4	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
5	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
6	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
7	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
8	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
9	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
10	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
11	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
12	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
13	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
14	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
15	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
16	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
17	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
18	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
19	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
20	Bekas	16	32	15	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11

If Keramasan watershed is not included in Keduang Watershed Conservation
 20 Sedimentation (Ton)
 21 Sedimentation (Ton)
 22 Sedimentation (Ton)
 23 Sedimentation (Ton)
 24 Sedimentation (Ton)
 25 Sedimentation (Ton)
 26 Sedimentation (Ton)
 27 Sedimentation (Ton)
 28 Sedimentation (Ton)
 29 Sedimentation (Ton)
 30 Sedimentation (Ton)

Table 3.7.1 Constraints and Problems for Watershed Conservation and Management

- Most of dry farm land, including those susceptible to erosion on steep slopes, developed for dry farm lands (tegal & pekarangan) are used for seasonal crops production and partly for perennial crops & tree planting; degradation of dry farm lands results in increased susceptibility to erosion of the land;
 - Which could be attributed to: i) development of steep lands for food crops production dictated by population pressure in the past and ii) increased cultivation of seasonal crops in home settlement area (pekarangan).
- Almost entire dry farm land on sloping lands have been terraced with different protection & stability statuses and such terraces are not always formed & maintained as recommended;
 - Which could be accounted for by: i) farmers awareness & technologies for importance of soil & water conservation are still limited, ii) family heads leave villages and farming is practiced by women & aged during their absence, and iii) financial constraints for maintenance & rehabilitation of terrace.
- Vegetative covers in dry farm land are largely governed by those of seasonal crops; remarkable changes from bare - maximum cover - bare, and vegetative covers by seasonal crops limited in critical period of February to March in MT II;
 - Which are explained by: vegetative covers by seasonal crops in dry land depending on cropping patterns which governed by rainfall distribution to a substantial degree; MT II is cropping season of dry season I.
- Deterioration of soil fertility and degradation of soil structure & soil moisture holding capacity;
 - Which are due to: i) soil inherent properties & poor soil management; ii) continuous cultivation of nutrient exhausting crops (cassava/maize) without application of adequate fertilizers, and iii) limited knowledge, time & interest in soil management & improvement.
- Farmers general preference for seasonal crops to perennial crops because poverty may cause farmers to use most of their land for crops to be readily converted into food/cash.
- Overall seasonal cropping intensity of dry farm land: 100 % in MT I, 39 % in MT II and 0 % in MT III;
 - Which are attributed to: i) cropping intensity in MT II is influenced by rainfall distribution in February/March and ii) dry spell from June to Sep. restricts cropping in MT III; possibility of seasonal crops in MT III is extremely limited.
- Soil moisture conservation practices such as mulching are seldom practiced and application of organic fertilizer limited;
 - Which are caused by: i) limited availability of mulching materials or materials for organic matters because crops residues used for animal fodder or fuel, ii) farmers knowledge & experiences on preparation of organic fertilizers limited and iii) densely populated beans in MT II leave no space for mulching.
- Adaptation rate of recommended farming practices are still low; use of self-multiplied seeds still common & use of fertilizer still below recommendation levels; and conservation oriented farming practices implemented not consistent with recommended practices;
 - Which could be attributed to: i) rainfall distribution not stable & crop productivity depending on it; farmers reluctance to take chances, ii) proper seeds & seedlings meeting farmers demand not always available, and iii) farm inputs prices higher compared with prices of products; accessibility to necessary fertilizers limited in a certain area; adequate bean variety not available.
- Productivities of seasonal crops are not stable and productivities of beans are still low. Income from farming is limited and not stable in dry land farming and contribution of the agriculture sector appears to be sufficient only for basic needs. Limited farm income forces farmers to seek job opportunities in urban areas;
 - Because productivity of annual crops limited, holding size not enough & production affected by rainfall distribution.
- Proper forestry management not introduced yet; over population, no fertilization, no selective cutting etc since extension activities primarily directed to forestation and not to forestry management.
- Cattle raising practices, genetic resources & veterinary services yet to be improved because of limited access to good breeds and extension & veterinary services.
- Farmers groups formed under DIPERTA & Forestry and declining social values and habits; traditional way of thinking & behavior;
 - Social solidarity in working together as in gotong royong & self reliant activities towards land rehabilitation & soil conservation has been upset as a result of grant aid given by project and Poor perception of the community to the agriculture sector to be a leading sector to improve welfare.
- Absence of farmers is detrimental to the sustainability target of the soil conservation policy & measures.
 - Seasonal migration to large cities is becoming an indispensable family activity to supplement family income, but becoming the main source of income of family; poverty forced dry land farmers to look to off-farm employment.
- Most farmers have small farms, capital & lack of bargaining power and result in limited agricultural intensification & income; force young people leave village & migrate to urban areas; next generation less interested in farming;
 - Interest in farming decreasing; reluctant to invest in land to improve productivity (because effect not visible); terrace maintenance is second priority.
- Shortage of fund for improvement of terraces & other physical structures by farmers & farmer groups; link between poverty and poor management of upland areas;
- Most of farmers have small farms & limited capital. These conditions result in limited agricultural intensification and may be regarded as main constraint to agricultural development, especially in connection with soil conservation and terrace rehabilitation; farmers limited access to credits.

Table 3.7.2 Key Issues for Watershed Conservation and Management

- The comprehensive development of a basin so as to make productive use of all its natural resources of soil, water & vegetative resources and also protect them is termed "watershed management" and could be envisaged through integrated & collaborated activities for watershed conservation.
- Emphasis on agricultural approaches as agricultural lands occupying majority of the subject areas and farmers accounting for almost all target groups of measures. Most causes of erosion are attributed to agricultural activities and most of erosion control measures are also closely related with them.
- Introduction of tree crops presents effective measures for soil erosion. However, types of agro-forestry should be determined based on comprehensive study on natural and socio-economic conditions since there will be certain competition between forestry and agricultural uses of land.
- Soil is a vital resource for the production of food and other necessities of life, however, soil is formed so slowly that it is essentially nonrenewable. Most of soil fertility is associated with nutrient, humus and clay content in top soil. Thus, an eroded soil is degraded chemically, physically, and biologically. The long term loss of productivity caused by soil erosion should be of great concern than temporary shortages. Maintaining the productive potential of soil over the long term is a fundamental purpose of soil conservation.
- Soil conservation objectives include both using the soil and maintaining its productive capacity. Type and intensity of land use and management must be chosen for long term usefulness of the land as well as for current needs.
- Farmers limited knowledge, interests & financial sources for adaptation of proper soil conservation measures are major causes for soil erosion.
- Link between poverty & poor management of dry farm land left being less attended due to farmers seeking for off-farm income in the cities should be addressed to an extent possible. Therefore, packages of conservation measures and improved agricultural practices must provide adequate and immediate & long term financial gains to farmers for ensuring positive participation of dry land farmers.
- Consideration on the welfare & livelihood of next generation (short & long term prospect) is prerequisite for the formulation of soil and land management measures.
- In the catchment area, farmers holding size is limited and measures will become a dispersed manner with limited effects when measures are introduced individually only by interested farmers. Therefore, community based introduction of measures is to be envisaged, which dictate understanding and agreement of a number of small scale farmers. Local people are the most important factor in good watershed management & resources development. Therefore, community should take a leading role for the watershed conservation from the stage of planning and collaborative activities of all stakeholders, community and implementing agency for the implementation of the conservation are essential.
- Soil conservation measures usually dictate large investment of labor and cost. Without sufficient understanding & agreement of practitioners, farmers/farmer groups in many cases, on the meanings, benefits and other details of conservation measures, anticipated results will not be resulted.

Table 4.3.1 Basic Directions for Formulation of Non-structural Conservation Measures

Slope Class	All Subject Area		Upland Field with Bench Terrace		Upland Field without Bench Terrace & Pekarangan 2/		Housing Yard 4/
	Agro-forestry Development/ Targeted Land Use		Current Terrace Condition		Composite 3/		
	Proportion of		Project Works: Terrace Improvement Works		Project Works: Ridge Terrace Formation/Upgrading Works		
	Annual Crop	Tree Crop/Tree	Physical Measures	Vegetative Measures	Physical Measures	Vegetative Measures	
0 - 8 %	90% (95%)	10% (5%)	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	No measure
8 - 15 %	75% (87.5%)	25% (12.5%)	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	
15 - 25 %	50% (75%)	50% 5/ (25%)	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	Establishing hedge row at fringes of housing yard
25 - 40 %	25% (62.5%)	75% 5/ (37.5%)	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	
> 40 %	- (50%)	100% 5/ (50%)	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	Improved Ridge Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	

1/: No Conservation works planned for good quality bench terrace

2/: Pekarangan under upland field condition

3/: Association of ridge, bench & non-terrace

4/: Housing yard in pekarangan

5/: Intercropped with medical crops

*: Actual portion of tree crops/trees is planned to be 50% of the target area.

Source: JICA Study Team

Table 4.3.2 Basic Countermeasures for Watershed Conservation in the Keduang Sub-catchment Area (1/2)

Subject Area	Slope Class	Terrace Type & Condition	Land Unit	Soil & Water Conservation Measures		Support Programs Required	
				Physical Measures	Vegetative Measures/Agro-forestry		
Upland Field with Bench Terrace	All Classes	Good Quality Bench Terrace	US1 ~ 4 T1	No conservation works planned	<p>1. Terrace Bench (cultivated area)</p> <p>(1) Agro-forestry & Land Use Modification</p> <ul style="list-style-type: none"> 1) Slope Class: 0 - 8 % Annual crops 90% + Tree crops/trees 10% 2) Slope Class: 8 - 15 % Annual crops 75% + Tree crops/trees 25% 3) Slope Class: >15 - 25 % Annual crops 50% + Tree crops/trees 50% 4) Slope Class: >25 - 40 % Land use conversion to orchard Tree crops/trees 75% + Annual crops 25% 5) Slope Class: >40 % Land use conversion to orchard/forest Tree crops/trees 100% 	<p>Annual Crops + Tree Crops/Tree</p> <p>Annual Crops + Tree Crops/Tree</p> <p>Annual Crops + Tree Crops/Tree (+ medical crops)</p> <p>Tree Crops/Trees + Annual Crops (+ medical crops)</p> <p>Tree Crops/Trees</p> <p>(+ medical crops + Cover Crop/Grasses)</p>	<p>Provision of:</p> <ul style="list-style-type: none"> - Agro-forestry Development <ul style="list-style-type: none"> • Tree crop/tree seedling • Fertilizer/compost • Labor cost (incentives) <p>Extension Services:</p> <ul style="list-style-type: none"> • Formation/empowerment of farmer groups • Training program • Field programs • Livestock support program
				<p>1-1. Terrace Lip Improvement</p> <p>(1) Terrace Lip Improvement</p> <ul style="list-style-type: none"> - Forming or reshaping & strengthening of terrace lip like ridge of paddy field <p>1-2. Terrace Riser Improvement</p> <p>(1) Terrace Riser Improvement</p> <ul style="list-style-type: none"> - Forming or reshaping of terrace riser - Preventing reshaping or clearing practices of riser & preserving vegetation <p>1-3. Terrace Bench Improvement</p> <p>(1) Terrace Bench Reformation</p> <ul style="list-style-type: none"> 1) Bench improvement & construction of terrace drain - Backward slopping of terrace bench; construction of terrace drain and excavation of dugout for water & sediment deposition <p>1-4. Waterway & Drop Structure Improvement</p> <p>1) Improvement of waterway & drop structure</p>	<p>1. Bench Terrace Improvement Works</p> <p>1. Terrace Lip</p> <p>(1) Terrace Lip Stabilization</p> <ul style="list-style-type: none"> 1) Vegetating lip with grasses or shrubs with economic use (fodder, fuel) 2) Preventing planting of cassava on lip <p>2. Terrace Riser</p> <p>(1) Terrace Riser Stabilization</p> <ul style="list-style-type: none"> 1) Vegetating riser with grasses of creeping nature 2) Preventing planting of cassava on riser <p>3. Terrace Bench (cultivated area)</p> <p>(1) Agro-forestry & Land Use Modification</p> <ul style="list-style-type: none"> 1) Slope Class: 0 - 8 % Annual crops 90% + Tree crops/trees 10% 2) Slope Class: 8 - 15 % Annual crops 75% + Tree crops/trees 25% 3) Slope Class: >15 - 25 % Annual crops 50% + Tree crops/trees 50% 4) Slope Class: >25 - 40 % Land use conversion to orchard Tree crops/trees 75% + Annual crops 25% 5) Slope Class: >40 % Land use conversion to orchard/forest Tree crops/trees 100% 	<p>Grasses</p> <ul style="list-style-type: none"> - Elephant grass - R. Kolonjono - <i>Brachyaria brizantha</i> <p>Shrubs</p> <ul style="list-style-type: none"> - <i>Leucaena leucocephala (tamtoro)</i> - <i>Glyricidae</i> - <i>Jatropha curcas</i> <p>Grasses (Creeping/runner type grasses preferable)</p> <ul style="list-style-type: none"> - <i>Brachyaria brizantha (BB)</i> - <i>Bracharia decumbens (BD)</i> - Local grass (ebalan rumput) <p>Annual Crops + Tree Crops/Tree</p> <p>Annual Crops + Tree Crops/Tree</p> <p>Annual Crops + Tree Crops/Tree (+ medical crops)</p> <p>Tree Crops/Trees + Annual Crops (+ medical crops)</p> <p>Tree Crops/Trees</p> <p>(+ medical crops + Cover Crop/Grasses)</p>	<p>Provision of:</p> <ul style="list-style-type: none"> - Agro-forestry Development <ul style="list-style-type: none"> • Tree crop/tree seedling • Fertilizer/compost • Labor cost (incentives) - Farming support <ul style="list-style-type: none"> • Soil ameliorant • Farm inputs <p>Extension Services:</p> <ul style="list-style-type: none"> • Formation/empowerment of farmer groups • Training program • Field programs • Livestock support program
		Medium & Fair to Poor Quality Bench Terrace	US1 ~ 5 T2 ~ 3				

Table 4.3.2 Basic Countermeasures for Watershed Conservation in the Keduang Sub-catchment Area (2/2)

Subject Area	Slope Class	Terrace Type & Condition	Land Unit	Soil & Water Conservation Measures		Support Programs Required	
				Physical Measures	Vegetative Measures/Agro-forestry		
Upland Field without Bench Terrace, Traditional Terrace & Settlement Area under upland Field Condition	0 ~ 40%	Composite	PS1 ~ S4 T4	<p>2-1. Construction of bench terrace</p> <p>1) Upgrading current terraces into improved bench terrace or formation of improved bench terrace</p>	<p>1. Terrace Lip Stabilization</p> <p>1) Vegetating lip with grasses or shrubs with economic use (fodder, fuel)</p> <p>2) Preventing planting of cassava on lip</p>	<p>Provision of:</p> <ul style="list-style-type: none"> - Agro-forestry Development - Tree crop/tree seedling - Fertilizer/compost - Labor cost (incentives) <p>- Farming support</p> <ul style="list-style-type: none"> - Soil ameliorant - Farm inputs <p>Extension Services:</p> <ul style="list-style-type: none"> - Formation/empowerment of farmer groups - Training program - Field programs - Livestock support program 	
				<p>2-2. Waterway & Drop Structure Construction</p> <p>1) Construction of waterway & drop structure</p>	<p>2. Terrace Riser</p> <p>(1) Terrace Riser Stabilization</p> <p>1) Vegetating riser with grasses of creeping nature</p> <p>2) Preventing planting of cassava on riser</p>		<p>Grasses</p> <ul style="list-style-type: none"> - Elephant grass - R. Kolonjono - <i>Brachyaria brizantha</i> <p>Shrubs</p> <ul style="list-style-type: none"> - <i>Leucaena leucocephala (tamtoro)</i> - <i>Glyricidae</i> - <i>Jatropha curcas</i> <p>Grasses (Creeping/runner type grasses preferable)</p> <ul style="list-style-type: none"> - <i>Brachyaria brizantha (BB)</i> - <i>Bracharia decumbens (BD)</i> - Local grass (ebalan rumpul) <p>Annual Crops + Tree Crops/Tree</p> <p>Annual Crops + Tree Crops/Tree</p> <p>Annual Crops + Tree Crops/Tree (+ medical crops)</p> <p>Tree Crops/Trees + Annual Crops (+ medical crops)</p>
				<p>3-2. Waterway & Drop Structure Construction</p> <p>1) Construction of waterway & drop</p>	<p>3. Terrace Bench (cultivated area)</p> <p>(1) Agro-forestry & Land Use Modification</p> <p>1) Slope Class: 0 - 8 % Annual crops 90% + Tree crops/trees 10%</p> <p>2) Slope Class: 8 - 15 % Annual crops 75% + Tree crops/trees 25%</p> <p>3) Slope Class: >15 - 25 % Annual crops 50% + Tree crops/trees 50%</p> <p>4) Slope Class: >25 - 40 % Land use conversion to orchard Tree crops/trees 75% + Annual crops 25%</p>		
<p>3-1. Construction of Improved Ridge Terrace</p> <p>1) Construction or upgrading of ridge terrace</p>	<p>1. Terrace Lip</p> <p>1) Vegetating lip with grasses or shrubs with economic use (fodder, fuel)</p>	<p>Provision of:</p> <ul style="list-style-type: none"> - Agro-forestry Development - Farming support <p>Extension Services:</p>					
<p>3-2. Waterway & Drop Structure Construction</p> <p>1) Construction of waterway & drop</p>	<p>2. Terrace Bench (cultivated area)</p> <p>(1) Agro-forestry & Land Use Modification</p> <p>1) Slope Class: > 40 % Land use conversion to orchard/forest Tree crops/trees 100%</p>		<p>Grasses</p> <ul style="list-style-type: none"> - Elephant grass, R. Kolonjono - <i>Brachyaria brizantha</i> <p>Shrubs</p> <ul style="list-style-type: none"> - <i>Leucaena leucocephala (tamtoro)</i> - <i>Glyricidae</i> - <i>Jatropha curcas</i> <p>Tree Crops/Trees (+ medical crops + Cover Crop/Grasses)</p>				
<p>No physical measures planned</p>	<p>1. Fringe of Housing Yard</p> <p>1) Erosion Mitigation in Housing Yard Establishment of hedge rows around housing yard</p>			<p>Provision of:</p> <ul style="list-style-type: none"> - Tree seedling - Labor cost (incentives) 			
<p>Housing 2/</p>	<p>Shrubs</p> <ul style="list-style-type: none"> - <i>Srenggan jantan (Flemingia congesta Roxb)</i> 						

1/: Kinds of tree crops/trees: to be selected by beneficiaries on need basis 2/: Housing yard Source: JICA Study Team

Table 4.3.5 Assessment of Candidate Grasses for Vegetative Conservation Measures in the Keduang Watershed

Plant	Characteristics	Vegetative Cover	Establishment	Economic/ Fodder Value	Assessment Based on Field Performances							Remarks	
					Target Areas/Purposes								
					Terrace	Lip	Riser	Farmland / Forest	Cover Crop	Gully Bank	Roadside Slope		Riverbank
I. Grasses													
a. Elephant grass (<i>Pennisetum purpureum</i>)	- Bunch type grass; not providing good ground cover - Fodder crops; widely planted in DAS - Form barriers when closely spaced	△	○	○	S	MS	-	MS	MS	MS	MS	NS	- Preferred as fodder crop by farmers - Lip & riser protection in IBRD Project
b. R. Kolonjono	- Bunch type grass; not providing good ground cover - Fodder crops	△	○	○	S	MS	-	MS	MS	MS	MS	NS	- Preferred as fodder crop by farmers - Lip & riser protection in IBRD Project
c. King Grass	- Fodder crops - Grass production higher than a	△	○	○	S	MS	-	MS	MS	MS	MS	MS	- Preferred as fodder crop by farmers
d. <i>Brachyaria brizantha</i> (BB/Blembum)	- Creeping grass for slope stabilization - Fodder crops - Introduced in DAS	○	○	△	MS	S	-	S	S	S	S	S	
e. <i>Setaria</i> (<i>Setaria sphacelata</i>)	- Bunch type grass; not providing good ground cover - Fodder crops - Form barriers when closely spaced - Common in DAS	△	○	△	S	MS	-	MS	MS	MS	MS	MS	- Lip & riser protection in IBRD Project, performance poor - Grass production lower than a, b, c
f. Star grass (<i>Cynodon nempfluensis</i>)	- Creeping grass applied for gully slope stabilization - Not so good as fodder crops	○	○	△	MS	MS	-	S	S	S	S	S	- Lip & riser protection in IBRD Project, performance poor
g. Vertiver (<i>Veriveria zizanioides</i>)	- Short grass; not so good as fodder crops - Used for terrace risers as long as the grass forms barriers - Form barriers when closely spaced & suited as barriers - Long life of 40 years & deep penetrating root - Difficult to obtain seedlings	○	○	△	MS	S	-	S	MS-S	S	S	S	- Lip & riser protection in IBRD Project, uprooted & used as herb by farmers
h. <i>Centrocema</i>	- Creeping legume; long time to be established - Could be used for riser protection	○	○	×	MS	MS	-	S	S	S	S	S	- Lip, riser & gully slope protection in IBRD Project
i. Local grass (Cebalan rumput)	- Creeping short grass like lawn/sod - Withered in dry spell & regenerate in wet spell	△	○	×	MS	S	-	MS	MS	MS	MS	MS	- Slope protection purpose of physical structures in IBRD Project
j. <i>Brachyaria decumbens</i>	Creeping grass for gully slope stabilization												- Not yet introduced in the past projects
k. <i>Panicum repens</i>	Creeping grass for gully slope stabilization												- Not yet introduced in the past projects
l. <i>Paspalum notatum</i>	- Very suitable for riverbank slope protection; not in Indonesia Creeping grass for gully slope stabilization												- Not yet introduced in the past projects

○ : good; △ : moderate; × : poor; HS: highly suitable; S: suitable; MS: marginally suitable; NS: not suitable

Source:(1) Petunjuk Teknis Pengelolaan Tanah dan Tanaman; DalamRangka Pelestarian Alam dan Konservasi Lahan; Ditjen Pertanian Tanaman Pangan, Dit B&Rehabilitasi dan Pengembangan Lahan, 1990
source:(2)Jenis Rumpuk yang dianjurkan dalam Usaha Tani Konservasi; Ditjen Pertanian Tanaman Pangan, Dit Perluasan Areal Pertanian, 1988

Table 4.3.8 Assessment of candidate Trees for Vegetative Conservation Measures in the Keduang Watershed

Tree	Characteristics	Vegetative cover	Establishment	Economic/Fodder Value	Assessment Based on Field Performances							Remarks	
					Target Area/Purposes								
					Terrace	Farmland / Forest	Cover Crop	Gully Bank	Riverbank	Roadside Slope			
					Lip	riser							
a. Teak	- Minor ground cover - Leaves used as fuel & ground remains bare	△	○	◎	NS	-	S	-	NS	-	NS	-	- Peoples Forest Program in IBRD Project & Gerhan - Not introduced in IBRD Project
b. Merkusii pine (<i>Pinus merksii</i>)	- Main tree in State Forest	△	△	○	NS	-	S	-	NS	-	NS	-	- Not introduced in IBRD Project
c. Mahogany (<i>Swietenia machopyllia</i>)	- Commonly planted in DAS	△	○	○	NS	-	S	-	MS	-	NS	-	- Not introduced in IBRD Project - Introduced in AMHR
d. Eucalyptus (<i>Eucalyptus deglupta</i>)	- Minor ground cover	△	○	○	NS	-	S	-	MS	-	NS	-	- Not introduced in IBRD Project
e. Sengon (<i>Albizia falcata</i>)	- Fast growing - Fodder tree & fuel wood; construction material	△	○	○	MS	-	S	-	MS	-	NS	-	- Peoples Forest Program in IBRD Project
f. Acacia (<i>A. mangium</i>)	- Drought resistant & land rehabilitation propose - Fuel wood, construction material	○	△	△	MS	-	S	-	MS	-	NS	-	- Not introduced in IBRD Project
g. Acacia (<i>A. auriculiformis</i>)	- Drought resistant & land rehabilitation propose - Fuel wood	○	△	△	MS	-	MS	-	MS	-	NS	-	- Not introduced in IBRD Project
h. Sonokelling (<i>D. latifolia</i>)	-	△	△	◎	NS	-	S	-	MS	-	NS	-	- Not introduced in IBRD Project
i. Lamtoro (<i>Leucaena leucocephala</i>)	- Shrub type; fodder tree, fuel wood - Deep rooting system - Legume to improve fertility; revegetating flatter area - Become quite effective barriers across slopes - Susceptible to disease	○	○	△	S	-	MS	-	MS	-	NS	-	- Not introduced in IBRD Project
j. <i>Glyricidaeae</i>	- Shrub type; fodder tree, fuel wood - Legume to improve fertility; revegetating flatter area	○	○	△	S	-	MS-S	-	NS	-	NS	-	- Not introduced in IBRD Project - Shading farm land, alley cropping
k. Bamboo (<i>Bambusaceae sp.</i>)	- Fast growing - Construction material - Possible to provide effective barrier for riverbank protection - Effective for gully head structure	△	○	○	NS	-	MS	-	S	-	S	-	- Not introduced in IBRD Project
o. <i>Salix babilonica</i>	- Riverbank protection vegetative barriers	not tested in Indonesia											

○ : good; △ : moderate; × : poor; HS: highly suitable; S: suitable; MS: marginally suitable; NS: not suitable

Source: (1) Tanaman Pupuk Hijau dan Tanaman Pionir untuk konservasi tanah, Ditjen Tanaman Pangan Dan Hortikultura, Dit Bina Rehabilitasi dan Pengembangan Lahan, 1996

Source: (2) Pedoman Penanaman Sonokelling, Dit Reboisasi dan Rehabilitasi, 1979

Table 4.3.9 Promising Perennial Crops in Wonogiri Catchment Area Assessed by District Agricultural Services

Kecamatan in Catchment Area	Commodity													
	Fruit							Estate Crop						
	Mango	Durian	Rambutan	Melinjo	Sukun	Pete	Citrus	Sawo	Cashew Nut	Coconut	Cacao	Janggolan	Nilam	
1. Pracimantoro	○				○		○		○	○	○			
2. Giritontro	○			○		○			○					
3. Giriwiryo	○						○							
4. Batuwarno	○	○	○			○								
5. Karangtengah		○	○				○							
6. Tirtomoyo	○	○	○								○		○	
7. Nguntoronadi	○					○								
8. Baturetno	○							○						
9. Eromoko	○						○	○	○					
10. Wuryantoro	○				○			○						
11. Manyaran	○						○	○	○					
12. Selogiri	○										○		○	
13. Wonogiri	○		○			○	○			○				
14. Ngadirojo		○				○	○			○				
15. Sidoharjo		○	○											
16. Jatiroto		○												
17. Slogohimo		○	○				○			○	○		○	
18. Jatisrono	○	○	○				○							
19. Jatipurno		○	○				○			○	○		○	
20. Girimarto		○	○				○			○			○	

Source: Wonogiri Agricultural Services Office

- Data Tetinggiin Tempat, Curah Hujan dan Potensi Tanaman Hortikultura dan Areka Tanaman

- Potensi Sumber Daya Alam Lainnya yang akan Dikembangkan

Table 4.3.10 Basic Vegetative and Agro-forestry Measures in Improved Bench & Ridge Terrace

Target Place & Vegetative Measures	Promising Plants	Planting Distance/Nos.	Fodder Value/Production/Remarks 1/
1. Terrace Lip 1) Terrace Lip Stabilization	Grasses - Elephant grass (<i>Pennisetum purpureum</i>) - Kolonjono (<i>Panicum muticum</i>) - King grass	20~30 cm in row 20~30 cm in row 20~30 cm in row	- Preferred as fodder crop by farmers Production: 100-200ton/ha/year - Preferred as fodder crop by farmers Production: 100-200ton/ha/year - Preferred as fodder crop by farmers Production: 100-200ton/ha/year
	Shrub - Lamtoro gung (<i>Leucaena leucocephala</i>) - Glirisidia (<i>Glyricidea speium</i>) - Jarak (<i>Jatropha curcas</i>) - Serengan jantan (<i>Flemingia congesta Roxb</i>)	3 ~ 5m in row 3 ~ 5m in row 2 ~ 3m in row 3 ~ 5m in row	- Having fodder value Production: 3 ton/ha/year - Having fodder value Production: 9 ton/ha/year - Fuel production - Having low fodder value; organic source Production: 14 ton/ha/year
2. Terrace Riser 1) Terrace Riser Stabilization	Grasses - BB (<i>Brachiaria brizantha</i>) - BD (<i>Brachiaria decumbens</i>) - Local grass (gebalan rumput)	20~30 x 25~50 cm 20~30 x 25~50 cm 20~30 x 25~50 cm	- Having fodder value Production: 154 ton/ha/year - Having fodder value Production: 40-70 ton/ha/year - Limited fodder value
3. Terrace Bench 1) Agro-forestry Development	Fruit/Estate Crop: - Category A Mango, durian, rambutan, Cashew nut, clove - Category B Cacao, mlinjo, citrus Tree: - Teak, mahogany, sengon, sonokeling	Slope Class: 0 - 8% - Land Use: • Annual crop: 90 % • Perennial crop: 10 %	- Proposed proportion of tree crop/tree 90 % fruit/estate crops & 10 % tree (Cacao : 100 trees/ha)
		Slope Class: > 8 - 15% - Land Use: • Annual crop: 75 % • Perennial crop: 25 %	- Proposed proportion of tree crop/tree 90 % fruit/estate crops & 10 % tree (Cacao : 250 trees/ha)
		Slope Class: 15 - 25 % - Land Use: • Annual crop: 50 % • Perennial crop: 50 %	- Inter-cropped with medicinal crops (empon-empon) (Cacao : 500 trees/ha)
		Slope Class: > 25 - 40 % - Land Use: • Annual crop: 25 % • Perennial crop: 75 %	- Inter-cropped with medicinal crops (empon-empon) (Cacao : 750 trees/ha)
		Slope Class: > 40 % - Land Use: • Perennial crop: 100 %	- Inter-cropped with medicinal crops (empon-empon) (Cacao : 1,000 trees/ha)
4. Housing Yard 1) Establishing Hedge Row	Shrub - Serengan jantan (<i>Flemingia congesta Roxb</i>)	20~30 x 50 cm	- To reduce soil erosion from housing yard

1/: Fodder production: production of fresh fodder

Table 4.4.1 Descriptions of Support Programs for Soil & Water Conservation Measures and Land Management & Agricultural Promotion Measures (1/4)

I. Support Programs for Soil & Water Conservation Measures - 1

Program	Objectives/Description	Target Area & Groups	Estimation of Program Requirements/Remarks	Estimated Program Cost (Rp.million) 1/ & 2/
1. Farmer & Farmer Groups Empowerment Package Program 1-1 Farmer Groups Formation Program	<ul style="list-style-type: none"> - To provide guidance to local government officials & farmers on proposed soil & water conservation measures and formation of KZTA (Kelompok Konservasi Tanah dan Air) for the same - To provide guidance & support for formation of KZTA 	<ul style="list-style-type: none"> - Target areas & beneficiary farmers of soil & water conservation measures 	<ul style="list-style-type: none"> - 1 unit per 5 KZTA group 1 KZTA per 25 farmers/20ha 	Program cost: 3.3 Total Program Cost Volume Estimated Cost: 113 373
1-2 Farmer Groups Empowerment Program (1) Key Farmer Training Program	<ul style="list-style-type: none"> - Training of key farmer of KZTA on technical & administrative issues on soil & water conservation measures - 1 training: 25 participants; 3 days course (including OJT) 	<ul style="list-style-type: none"> - Key farmers of KZTA 	<ul style="list-style-type: none"> - 1 training per 25 KZTA/500ha 	Program cost: 11.0 Total Program Cost Volume Estimated Cost: 23 253
(2) Conservation Demonstration Program	<ul style="list-style-type: none"> - Demonstration of proposed soil & water conservation measures by key farmers received Key Farmer Training - Target activities: <ul style="list-style-type: none"> • Terrace improvement & upgrading/formation works • Terrace lip & riser stabilization works • Agro-forestry development • Improved farming practices - Plot sizes: ± 1.0ha 	<ul style="list-style-type: none"> - Target areas of soil & water conservation measures - Member farmers of KZTA 	<ul style="list-style-type: none"> - 1 plot per 200ha of target areas for soil & water conservation measures 	Program cost: 11.0 Total Program Cost Volume Estimated Cost: 57 627
(3) Mass Guidance Program	<ul style="list-style-type: none"> - Provision of mass guidance to KZTA members on proposed soil & water conservation measures demonstrated in a demonstration plot through opening Farmer Field Days 	<ul style="list-style-type: none"> - Target areas of soil & water conservation measures - Member farmers of KZTA 	<ul style="list-style-type: none"> - 1 guidance per 5KZTA/100ha 	Program cost: 1.1 Total Program Cost Volume Estimated Cost: 113 124
(4) Need Inventory Meeting	<ul style="list-style-type: none"> - Consultation meeting for inventorying farmers needs for tree species for agro-forestry development held by Key Farmer & field extension staffs 	<ul style="list-style-type: none"> - Target areas of soil & water conservation measures - Member farmers of KZTA 	<ul style="list-style-type: none"> - 1 workshop per KZTA/20ha 	Program cost: 0.6 Total Program Cost Volume Estimated Cost: 556 311
2. Package Program for Operation/Implementation of Conservation Measures 2-1 Terrace Formation Guidance Program (1) Technical Guidance	<ul style="list-style-type: none"> - Provision of the 2nd technical guidance to KZTA members on proposed soil & water conservation measures & procedures for provision of support package prior to the execution of the conservation measures 	<ul style="list-style-type: none"> - Target areas of soil & water conservation measures - Member farmers of KZTA 	<ul style="list-style-type: none"> - 1 guidance per KZTA/20ha 	Program cost: 0.6 Total Program Cost Volume Estimated Cost: 556 311
(2) Support Package 1) Grasses/Tree Seedlings Supply for Terrace Stabilization 2) Labor Costs Subsidy for Terrace Formation Works	<ul style="list-style-type: none"> - Provision of grasses/shrub seedlings used for terrace lip & riser and ridge stabilization - Subsidy for labor costs required for terrace improvement or upgrading works - Rate of subsidy: 50 % of required labor costs 	<ul style="list-style-type: none"> - Target areas of soil & water conservation measures - Member farmers of KZTA - Target areas of soil & water conservation measures - Member farmers of KZTA 	<ul style="list-style-type: none"> - Target areas of soil & water conservation measures in each year - Implemented by KZTA/20ha - Target areas of soil & water conservation measures in each year - Implemented by KZTA/20ha 	Estimated for each subject area & land unit Estimated for each subject area & land unit

Table 4.4.1 Descriptions of Support Programs for Soil & Water Conservation Measures and Land Management & Agricultural Promotion Measures (2/4)

I. Support Programs for Soil & Water Conservation Measures - 2

Program	Objectives/Description	Target Area & Groups	Estimation of Program Requirements/Remarks	Estimated Program Cost (Rp.million) 1/ & 2/
2. Package Program for Operation/Implementation of Conservation Measures - continued 2-2 Agro-forestry/Development Program (1) Technical Guidance	- Provision of technical guidance to K2TA members on agro-forestry development proposed in soil & water conservation measures	- Target areas of soil & water conservation measures - Member farmers of K2TA	- Target areas of soil & water conservation measures in each year - Implemented by 5K2TA/20ha	Program cost: Total Program Cost Volume Estimated Cost 0.6 536 311
(2) Support Package 1) Tree Crops/Tree Seedlings Supply	- Provision of tree crops/tree seedlings for agro-forestry development • 1st year: 100% of requirement • 2nd year: 10-20% of requirements for replanting - Provision of farm inputs for agro-forestry development • Compost & chemical fertilizer (compost: 2ton/ha, NPK fertilizer: 200 kg/ha)	- Target areas of soil & water conservation measures - Member farmers of K2TA	- Target areas of soil & water conservation measures in each year - Implemented by K2TA/20ha	Estimated for each subject area & land unit
2) Farm Inputs Supply	- Provision of technical guidance on farming system improvement to K2TA members on soil & water conservation oriented improved farming system	- Target areas of soil & water conservation measures - Member farmers of K2TA	- Target areas of soil & water conservation measures in each year - Implemented by K2TA/20ha	Estimated for each subject area & land unit
2-3 Farming Support Program (1) Technical Guidance	- Provision of soil ameliorant and farm inputs for farming system improvement (compost: 1 ton/ha, dolomite: 1 ton/ha, NPK fertilizer: 200 kg/ha, seed)	- Target areas of soil & water conservation measures - Member farmers of K2TA	- Target areas of soil & water conservation measures in each year - Implemented by K2TA/20ha	Program cost: Total Program Cost Volume Estimated Cost 0.6 536 311
(2) Support Package	- Provision of intensive field technical guidance by extension staffs (PPL/PKCL) in a year of implementation of measures	- Target areas of soil & water conservation measures	- 1 PPL/PKCL: 25 K2TA/500ha	Estimated for each subject area & land unit
2-3 Field Guidance Program (1) Inception Technical Guidance & Support	- Provision of field technical guidance by extension staffs (PPL/PKCL) in the 2nd year and after	- Target areas of soil & water conservation measures	- 1 PPL/PKCL: 25 K2TA/500ha	Program cost: Total Program Cost Volume Estimated Cost 3.0 23 69
(2) Follow-up Technical Guidance & Support	- Induction & refresher training of PPLs/PKCLs in the catchment area to provide technical & administrative guidance on the proposed soil & water conservation	- PPLs/PKCLs in the catchment area	- 1 PPL/PKCL: 25 K2TA/500ha	Program cost: Total Program Cost Volume Estimated Cost 1.0 23 23
3. Field Staff Empowerment Program 3-1 Field Staff Training	- Induction & refresher training of PPLs/PKCLs in the catchment area to provide technical & administrative guidance on the proposed soil & water conservation	- PPLs/PKCLs in the catchment area	Induction training: - At the beginning of 1st year of Refresher training: 2 times/year	Direct cost: Admin. cost: Program cost: Total Program Cost Volume Estimated Cost 11.0 10 110
Total for Support Programs for Soil & Water Conservation Measures				2.823

Table 4.4.1 Descriptions of Support Programs for Soil & Water Conservation Measures and Land Management & Agricultural Promotion Measures (3/4)

II. Support Programs for Land Management & Agricultural Promotion Measures -1

Program	Objectives/Description	Target Area & Groups	Estimation of Program Requirements/Remarks	Estimated Program Cost (Rp.million) 1/ & 2/
1. Technology Development Program 1-1 Research-Extension Dialog Team	- Visit to problem areas by a team composing of researchers & extension staffs to identify problems, solution or program needs to solve the problems	- Target areas of soil & water conservation measures	- 2 programs/year	Program cost: 3.3 Total Program Cost Volume 10 Estimated Cost 33
1-2 Simple Trial/Adaptability Trial	- To verify adaptability of improved farming practices, soil & water conservation oriented farming practices & varieties developed or recommended by BPTP Central Java under the guidance & support of BPTP	- Target areas of soil & water conservation measures - Plot size: ± 0.1 ha	- 1 unit/500 ha of target area or 25 K2TAGs	Program cost: 5.5 Total Program Cost Volume 23 Estimated Cost 127
2. Demonstration Program 2-1 Demonstration Plot (1 ha)	- Farmer operated demonstration activities on improved farming practices, soil & water conservation oriented farming practices & new varieties etc.	- Target areas of soil & water conservation measures - Plot size: ± 1.0 ha	- 1 unit/500 ha of target area or 25 K2TAGs - Field days: 3 times	Program cost: 11.0 Total Program Cost Volume 23 Estimated Cost 253
2-2 Cropping Pattern Demonstration	- Demonstration of improved cropping pattern & riley cropping	- Target areas of soil & water conservation measures - Plot size: ± 1.0 ha	- 1 unit/1000 ha of target area or 50 K2TAGs - Field days: 3 times x 2 season	Program cost: 22.0 Total Program Cost Volume 11 Estimated Cost 242
3. Pilot Demonstration Field of Tree Crops/Trees	- Farmer/village operated demonstration activities on agro-forestry development (tree crops/trees) under the guidance of technical & research agencies	- Target areas of soil & water conservation measures - Plot size: ± 1.0 ha	- 1 unit/village - 83 project villages	Program cost: 11.0 Total Program Cost Volume 83 Estimated Cost 913
4. Farmer & Farmer Group Training Program 4-1 Farmer & Farmer Group Training Program	- Training of representatives of farmers/farmer group in class or practical training - Subject: Improved farming practices, compost preparation, farmer organization, marketing, post-harvest, processing & other subjects on need basis - 3 days per course; 20-30 participants/course	- K2TAGs of the target areas of soil & water conservation measures - Representatives of K2TAGs	- 1 unit/25 K2TAGs or 500 ha of target area	Program cost: 5.5 Total Program Cost Volume 23 Estimated Cost 127
4-2 Mass Guidance/Campaign/Workshop	- Mass guidance/campaign on specific subjects by desa in principle - Subject: Land management for soil conservation, terrace maintenance, maintenance of waterways etc.	- Target villages of soil & water conservation measures	- 1 unit/village x 2 times (during a project period) - 83 project villages	Program cost: 3.3 Total Program Cost Volume 166 Estimated Cost 548

Table 4.4.1 Descriptions of Support Programs for Soil & Water Conservation Measures and Land Management & Agricultural Promotion Measures (4/4)

II. Support Program3 for Land Management & Agricultural Promotion Measures -2

Program	Objectives/Description	Target Area & Groups	Estimation of Program Requirements/Remarks	Estimated Program Cost (Rp.million) 1/ & 2/
5. Palawija Seed Production Program 5-1 Palawija Seed Production Program	<ul style="list-style-type: none"> - Formation of palawija seed growers group - Providing technical guidance and seed processing facilities & farm inputs to establish palawija seed growers in the catchment area aiming at improving quality palawija seed supply 	<ul style="list-style-type: none"> - Irrigated paddy fields - Group of advanced farmers 	<ul style="list-style-type: none"> - 1 unity/year - Total 2 units 	<ul style="list-style-type: none"> Program cost: 55.0 Total Program Cost Volume 2 Estimated Cost 110
5-2. Seed Campaign	<ul style="list-style-type: none"> - Supporting seed growers for 1 crop - Motivating farmers to use qualified palawija seed through desa level campaign 	<ul style="list-style-type: none"> - Target areas of soil & water conservation measures - Areas where adaptation rate of quality seeds is still low 	<ul style="list-style-type: none"> - 1 campaign per desa or plural desa 	<ul style="list-style-type: none"> Program cost: 3.3 Total Program Cost Volume 40 Estimated Cost 132
6. Strengthening of Logistic Support for Extension Activities 6-1. Kecamatan Level	<ul style="list-style-type: none"> - Provision of motorcycles, training equipment & office facilities for strengthening of logistic support for PPLs/PKIs in the catchment area 	<ul style="list-style-type: none"> - BPPs or branch offices of District - 20 BPPs in Wonogiri & 3 branch offices in Pacitan; in total 23 kecamatan 	<ul style="list-style-type: none"> - 1 package per target kecamatan - Motor cycle: 3 units - Training equipment: 1 set - Office facility: 1 set 	<ul style="list-style-type: none"> Program cost: 65 (Motor cycle: 45.0) (Equipment: 10.0) (Facility: 10.0)
6-2. District level	<ul style="list-style-type: none"> - Provision of vehicle for intensifying extension & guidance activities by district staffs 	<ul style="list-style-type: none"> - District Agriculture Services Office & Forestry Sub-services Office, Wonogiri 	<ul style="list-style-type: none"> - 2 4 wheel vehicles for each Office 	<ul style="list-style-type: none"> Program cost: 640
Total for Support Programs for Land Management & Agricultural Promotion Measures				3,190
Overall Support Programs				6,013

1/: Estimated based on similar program costs of Agriculture Services & Forestry Sub-services Office, Kab. Wonogiri and the same planned for AWP 2005 for Agricultural Extension Programs in Batang Hari Irrigation Project

2/: Administrative cost assumed to be about 10% of program direct cost 3/: Program implemented by Dinas Kehewanan, Perikanan dan Kelautan, Kabupaten Wonogiri

Table 4.4.2 Descriptions of Support Programs for Community Development (1/2)

Program	Objectives/Description	Target Area & Groups	Estimation of Program Requirements/Remarks	Estimated Program Cost (Rp. million) 1/ & 2/
1. Village Action Plan (VAP) for Soil Conservation 1-1 Implementation of village assessment	<ul style="list-style-type: none"> - To assess the present condition, problems, village resources, and development potentials in villages using PRA tools (i) informal interviews, ii) focus group discussion, iii) village history for soil conservation and forestation, iv) participatory mapping, v) institutional relation diagram (Venn Diagram), vi) field transect to identify the eroded location, vii) livelihood and gender role analysis viii) - To provide three facilitators for the village 	<ul style="list-style-type: none"> - Key informant, village and hamlet administration, existing village 	<ul style="list-style-type: none"> - One week including preparatory work per village - Three facilitators 	Direct cost: 3.0 Program cost: 3.0 X 82 villages 246.0
1-2 Formulation of VAP (1) Formulation of Draft VAP	<ul style="list-style-type: none"> - To facilitate the village action plan for soil conservation with economical and social development - To provide three facilitators for the village and one workshop 	<ul style="list-style-type: none"> - Key informant, village and hamlet administration, existing village 	<ul style="list-style-type: none"> - One day workshop per village - Three facilitators 	Direct cost: 2.0 Program cost: 2.0 X 82 villages 164.0
(2) Discussion with Executing Agency	<ul style="list-style-type: none"> - To build consensus with executing agency and Kecamatan (sub-district) office through discussion of the further step (items to be involved in the project, schedule and content of the detailed survey) with the implementation committee - To provide one moderator for meeting 	<ul style="list-style-type: none"> - Executing Agency - Kecamatan Office - Implementation Committee 	<ul style="list-style-type: none"> - Half day meeting - One moderator 	Direct cost: 0.5 Program cost: 0.5 X 82 villages 41.0
(3) Finalizing MOU for VAP	<ul style="list-style-type: none"> - To draft memorandum of understanding (MOU) on the project including i) components and its work volume covered by the project, ii) share of the responsibility in the implementation stage, and iii) share of responsibility in the operation and maintenance stage in the second workshop - To provide one facilitator for the village and one day workshop 	<ul style="list-style-type: none"> - Key informant, village and hamlet administration, existing village - Implementation Committee 	<ul style="list-style-type: none"> - One day workshop per village - One facilitator 	Direct cost: 2.0 Program cost: 2.0 X 82 villages 164.0
(4) Conclusion of MOU for VAP	<ul style="list-style-type: none"> - To build consensus with executing agency and Kecamatan (sub-district) office through discussion of the MOU with the implementation committee - To provide one moderator for meeting 	<ul style="list-style-type: none"> - Executing Agency - Kecamatan Office - Implementation Committee 	<ul style="list-style-type: none"> - Half day meeting - One moderator 	Direct cost: 0.5 Program cost: 0.5 X 82 villages 41.0
2. Establishment of Implementation Committee (1) Election of Committee member	<ul style="list-style-type: none"> - To discuss the responsibility and duty of implementation - To decide selection method for the committee member - To select the committee member - To provide one facilitator for the village and two day 	<ul style="list-style-type: none"> - Key informant, village and hamlet administration, existing village 	<ul style="list-style-type: none"> - 1 guidance per K2TA/20ha 	Direct cost: 2.0 Program cost: 2.0 X 82 villages 164.0

1/: Estimated based on cost of JICA village survey

Table 4.4.2 Descriptions of Support Programs for Community Development (2/2)

Program	Objectives/Description	Target Area & Groups	Estimation of Program Requirements/Remarks	Estimated Program Cost (Rp million) 1/ & 2/
3. Guidance of village grant fund				
3-1 Formulation of fund use plan	<ul style="list-style-type: none"> - To explain the village grant fund (amount, eligibility of use, non-eligibility of use, operation and management) - To provide one local NGO for the village meeting - To prepare the draft plan (items to be done, budget allocation, person in charge for fund operation and management, auditing, booking etc.) - To provide one local NGO from time to time 	<ul style="list-style-type: none"> - Key informant, village and hamlet administration, existing village - Implementation Committee 	<ul style="list-style-type: none"> - One day explanation meeting - One local NGO 	<ul style="list-style-type: none"> Direct cost: 2.0 Program cost: 2.0 X 82 villages 164.0 Direct cost: 2.0
(2) Formulation of draft plan	<ul style="list-style-type: none"> - To carry out socialization program on the draft plan - To built consensus amongst village people for the draft plan - To provide one facilitator for consensus building workshop 	<ul style="list-style-type: none"> - Key informant, village and hamlet administration, existing village - Implementation Committee 	<ul style="list-style-type: none"> - Technical assistance to be made by local NGO - One day workshop per village - One facilitator 	<ul style="list-style-type: none"> Program cost: 2.0 X 82 villages 164.0 Direct cost: 1.0
(3) Consensus building	<ul style="list-style-type: none"> - To build consensus with executing agency and Kecamatan (sub-district) office through discussion of the agreement with the implementation committee - To provide one moderator for meeting 	<ul style="list-style-type: none"> - Executing Agency - Kecamatan Office - Implementation Committee 	<ul style="list-style-type: none"> - Half day meeting - One moderator 	<ul style="list-style-type: none"> Program cost: 0.5 X 82 villages 41.0
3-2 Agreement with Executing Agency				
(1) Conclusion of agreement for the fund	<ul style="list-style-type: none"> - Provision of village grant fund to the account of the implementation committee 	<ul style="list-style-type: none"> - Implementation Committee 	<ul style="list-style-type: none"> - Rp. 40 million (at maximum) per village 	<ul style="list-style-type: none"> Program cost: 40.0 X 82 villages 3,280.0
3-3 Operation of the fund	<ul style="list-style-type: none"> - Provision of technical guidance by local NGO as necessity 	<ul style="list-style-type: none"> - Beneficiaries 	<ul style="list-style-type: none"> - Technical assistance to be made by local NGO 	<ul style="list-style-type: none"> Program cost: 5.0 X 82 villages 410.0
(2) Follow-up technical guidance & support	<ul style="list-style-type: none"> - To prepare pamphlet, video CD on watershed conservation and Wonogiri dam - To provide pamphlet and video CD 	<ul style="list-style-type: none"> - Implementation Committee - Beneficiaries 	<ul style="list-style-type: none"> - Preparation and distribution of materials 	<ul style="list-style-type: none"> Direct cost: 10.0 Program cost: 10.0 Direct cost: 10.0
5. Education Program				
5-1 Preparation of Materials	<ul style="list-style-type: none"> - To establish village library to keep the VAP, guideline or manual to be prepared by the project 	<ul style="list-style-type: none"> - Implementation Committee - Beneficiaries 	<ul style="list-style-type: none"> - Provision of book stands 	<ul style="list-style-type: none"> Program cost: 11.0 Direct cost: 10.0
(1) Preparation of education materials	<ul style="list-style-type: none"> - Provision of information on importance of watershed conservation and Wonogiri dam 	<ul style="list-style-type: none"> - School teacher & students and members of PTA 	<ul style="list-style-type: none"> - Provision of Seminar 	<ul style="list-style-type: none"> Program cost: 10.0 Direct cost: 10.0
(2) Establishment of Village Library	<ul style="list-style-type: none"> - Provision of information on importance of watershed conservation and Wonogiri dam 	<ul style="list-style-type: none"> - PPL and PKL - Local NGOs 	<ul style="list-style-type: none"> - Provision of Seminar 	<ul style="list-style-type: none"> Program cost: 10.0 Direct cost: 10.0
5-2 Implementation of Special Lecture & Campaign	<ul style="list-style-type: none"> - Provision of information on importance of Wonogiri dam 	<ul style="list-style-type: none"> - Implementation Committee - Beneficiaries 	<ul style="list-style-type: none"> - Provision of Tour 	<ul style="list-style-type: none"> Program cost: 10.0 Direct cost: 10.0
(1) Special lecture to the elementary school	<ul style="list-style-type: none"> - Provision of information on importance of watershed conservation and Wonogiri dam 	<ul style="list-style-type: none"> - Publics 	<ul style="list-style-type: none"> - Provision of Campaign 	<ul style="list-style-type: none"> Program cost: 1.0 Direct cost: 1.0
(2) Special lecture to the extension staff and local NGOs	<ul style="list-style-type: none"> - Provision of information on importance of watershed conservation and Wonogiri dam 			
(3) Study tour to the Wonogiri dam	<ul style="list-style-type: none"> - Provision of information on importance of watershed conservation and Wonogiri dam 			
(4) Campaign activities in the festival or town events	<ul style="list-style-type: none"> - Provision of information on importance of watershed conservation and Wonogiri dam 			
			Grand Total	5,013

1/; Estimated by the JICA Study Team

Table 4.4.3 Outline of Village Grant Fund

<u>Implementer:</u>	Implementation Committee and village people
<u>Fund source:</u>	Executing agency
<u>Supporting organization:</u>	Local NGO
<u>Purpose:</u>	To empower the village community in the process of the small projects using village grand fund
<u>Amount of fund:</u>	Maximum amount is Rs. 40 million per village
<u>Items to be done:</u>	<ul style="list-style-type: none"> - Formulation of VAP (1) Selection of items to be covered by the village grand fund (2) Implementation of the detailed survey and formulation of plan (3) Consensus building for Plan at the workshop (4) Finalization of MOU including approval of items to be done using village grant fund (5) Implementation of items using village grant fund including supporting program (6) Monitoring
<u>Condition of fund use:</u>	<p>The fund can be utilized by the decision of implementation committee with consent of village people. However, the following limitation of fund use should be applied.</p> <ul style="list-style-type: none"> (1) The items proposed in the VAP, but not implemented in the project works. (2) The items fully agreed with village people (3) The items not include cash distribution to individual people (4) The items supported by the detailed survey and planning result to be made by the village. (5) The items approved by executing agency
<u>Duration of fund use:</u>	One year
<u>Responsibility of village:</u>	<ul style="list-style-type: none"> - Maintain of account book audited by village administration, - Maintain of record and meeting records - O&M of facilities and equipment

Table 4.4.4 Outline of Education Program

<u>Implementer:</u>	Implementation committee and executing agency
<u>Fund source:</u>	Executing agency
<u>Supporting organization:</u>	Local NGO
<u>Purpose:</u>	To increase understandings of importance of watershed and Wonogiri dam reservoir
<u>Items to be done:</u>	<ul style="list-style-type: none"> (1) Preparation and distribution of pamphlet, video CD, etc (2) Establishment of village library to keep the VAP, guideline or manual to be prepared by the project (3) Special lecture to the elementary school, junior high school, and PTA activities (4) Special lecture to the extension staff and local NGOs (5) Implementation of study tour to the Wonogiri dam (6) Implementation of campaign activities in the festival or town events etc.

Table 4.6.3 Future Annual Average Soil Loss of Subject Area for Kedung Watershed Conservation for All Villages (2/2)

Unit: Hectare ha

No	Desa	Kecamatan	Ara (05)		Annual (1881-2011)		Annual (2011-2025)		Annual (1881-2025)		Annual (1881-2025)		Annual (1881-2025)		Annual (1881-2025)		Annual (1881-2025)		Annual (1881-2025)		Annual (1881-2025)		Annual (1881-2025)		Annual (1881-2025)			
			Sub-Subj. Ara	Subj. Ara	Subj. Ara	Sub-Subj. Ara	Subj. Ara	Subj. Ara	Sub-Subj. Ara	Subj. Ara	Sub-Subj. Ara	Subj. Ara	Sub-Subj. Ara	Subj. Ara	Sub-Subj. Ara	Subj. Ara	Sub-Subj. Ara	Subj. Ara	Sub-Subj. Ara	Subj. Ara	Sub-Subj. Ara	Subj. Ara	Sub-Subj. Ara	Subj. Ara	Sub-Subj. Ara	Subj. Ara	Sub-Subj. Ara	Subj. Ara
1
Total																												
Sub-Total																												

1/ Kecamatan subdaerah tingkat I di Kabupaten Wonorejo
 2/ Subj. Ara = Subj. Ara
 3/ Sub-Subj. Ara = Sub-Subj. Ara
 4/ Subj. Ara = Subj. Ara
 5/ Sub-Subj. Ara = Sub-Subj. Ara
 6/ Subj. Ara = Subj. Ara
 7/ Sub-Subj. Ara = Sub-Subj. Ara

Table 4.8.2 Assumptions Applied for Cropping Patterns

Item	Assumptions Applied for Analysis
1. Target agricultural activities	Crop sub-sector in upland field
2. Farm size of typical farm	Upland field: net cultivable area 0.5 ha/farm
3. Duration of analysis	15 years
4. Current cropping pattern	<u>Pattern for uplands with slope classes of 0 ~ 25%</u> MT I: maize (hybrid; intensity 100%) + cassava (intensity 20%) MT II: groundnut (intensity 40%) + cassava (intensity 20%) MT III: cassava (intensity 20%)
	<u>Pattern for uplands with slope classes of above 25%</u> MT I: maize (composite; intensity 100%) + cassava (intensity 20%) MT II: groundnut (intensity 40%) + cassava (intensity 20%) MT III: cassava (intensity 20%)
5. With-project cropping pattern	(1) Slope Class: 0 - 8% Typical Farm A-1
	<u>1st to 4th year</u> MT I: maize (hybrid; 100%) + cassava (20%) + tree crops (5%) MT II: groundnut (intensity 40%) + cassava (20%) + tree crops (5%) MT III: cassava (20%) + tree crops (5%)
	<u>5th year & after</u> MT I: maize (hybrid; 95%) + cassava (20%) + tree crops (5%) MT II: groundnut (40%) + cassava (20%) + tree crops (5%) MT III: cassava (20%) + tree crops (5%)
	(2) Slope Class: > 8 - 15% Typical Farm A-2
	<u>1st to 4th year</u> MT I: maize (hybrid; 100%) + cassava (15%) + tree crops (13%) MT II: groundnut (40%) + cassava (15%) + tree crops (13%) MT III: cassava (15%) + tree crops (13%)
	<u>5th year & after</u> MT I: maize (hybrid; 87%) + cassava (10%) + tree crops (13%) MT II: groundnut (40%) + cassava (10%) + tree crops (13%) MT III: cassava (10%) + tree crops (13%)
	(3) Slope Class: > 15 - 25% Typical Farm A-3
	<u>1st to 4th year</u> MT I: maize (hybrid; 90%) + cassava (10%) + tree crops (25%) MT II: groundnut (40%) + cassava (10%) + tree crops (25%) MT III: cassava (10%) + tree crops (25%)
	<u>5th year & after</u> MT I: maize (hybrid; 75%) + medical crop (10%) + tree crops (25%) MT II: groundnut (30%) + medical crop (10%) + tree crops (25%) MT III: tree crops (25%)
	(4) Slope Class: > 25 - 40% Typical Farm B-1
	<u>1st to 4th year</u> MT I: maize (hybrid; 75%) + cassava (5%) + tree crops (38%) MT II: groundnut (30%) + cassava (5%) + tree crops (38%) MT III: cassava (5%) + tree crops (38%)
	<u>5th year & after</u> MT I: maize (hybrid; 62%) + medical crop (10%) + tree crops (38%) MT II: groundnut (30%) + medical crop (10%) + tree crops (38%) MT III: tree crops (38%)
(5) Slope Class: > 40% Typical Farm B-2	
<u>1st to 4th year</u> MT I: maize (hybrid; 60%) + tree crops (50%) MT II: groundnut (30%) + tree crops (50%) MT III: tree crops (50%)	
<u>5th year & after</u> MT I: Maize (hybrid; 50%), tree crops (50%) + medicinal crop (20%) MT II: Groundnut (30%), tree crops (50%) + medicinal crop (20%) MT III: tree crops (50%)	

Table 4.8.3 Economic Crop Budget of Palawija per Ha under Monoculture (Current Condition)

Production (ton) Unit Price (Rp.000/kg) Gross Return (Rp. million)	Maize (Hybrid)			Maize (Komposit)			Groundnut			Cassava (1 season)		
	Unit	Unit Price (Rp.000)	Q'ty	Amount (Rp.000)	Unit Price (Rp.000)	Q'ty	Amount (Rp.000)	Unit Price (Rp.000)	Q'ty	Amount (Rp.000)	Unit Price (Rp.000)	Q'ty
1. Materials												
Seed	kg	27.0	17	459	7.0	17	119	4.0	100	400	10,000	280
Fertilizer Urea	kg	2.7	200	540	2.7	150	405	2.7	50	135	2.7	50
TSP	kg	1.8	100	180	1.8	75	135	1.8	100	180	1.8	25
KCL	kg	1.5	50	75	1.5	50	75	1.5	50	75	1.5	0
Compost	ton	200	2	400	200	1	200	200	1	200	200	0
Dolomite	ton	0	0	0	0	0	0	0	0	0	0	0
Rhizobium	g	0	0	0	0	0	0	0	0	0	0	0
Pesticide	kg	8.0	2	16	0	0	0	0	0	0	0	0
lit	lit	100	1	100	0	0	0	0	0	0	0	0
2. Labor I/												
Land Preparation	mandays		25	1,634		25	1,472		25	1,958		1,013
Family	mandays	13.5	17	230	13.5	17	230	13.5	17	230	13.5	25
Hired	mandays	13.5	8	108	13.5	8	108	13.5	8	108	13.5	17
Farm Management/Harvest	mandays	13.5	96	1,296	13.5	84	1,134	13.5	120	1,620	13.5	8
Family	mandays	13.5	67	905	13.5	59	797	13.5	84	1,134	13.5	50
Hired	mandays	13.5	29	392	13.5	25	338	13.5	36	486	13.5	15
Total Labor	mandays		121			109			145			35
Family	mandays		84			76			101			75
Hired	mandays		37			33			44			32
Threshing/Shelling	mandays		0			0			0			43
Machinery	machineday		0			0			0			0
3. Threshing/Shelling												
4. Miscellaneous Costs (1+2+3) x 10%												
Total Costs (Rp.000)				3,744			2,646			3,242		1,422
Net Return (Rp. Million)			36%	2.11		35%	1.45		41%	2.26		0.68

Note: Crop budget indicated in bold letters applied for the present study

Cropping Season: MT II

Production (ton) Unit Price (Rp.000/kg) Gross Return (Rp. million)	Groundnut		
	Unit	Unit Price (Rp.000)	Q'ty
Development/Production Costs			
1. Materials			
Seed	kg	6.5	100
Fertilizer 2/	-		0
Pesticide 2/	-		0
2. Labor I/			
Land Preparation	mandays		13
Family	mandays	13.5	9
Hired	mandays	13.5	4
Farm Management/Harvest	mandays	120	1,620
Family	mandays	13.5	84
Hired	mandays	13.5	36
Total Labor	mandays		133
Family	mandays		93
Hired	mandays		40
Threshing/Shelling	mandays		0
Machinery	machineday		0
3. Threshing/Shelling			
4. Miscellaneous Costs (1+2+3) x 10%			
Total Costs (Rp.000)			3,079
Net Return (Rp. Million)		20%	0.77

Note: Crop budget indicated in bold letters applied for the present study

1/ Assuming Family labor account for 70 % of total labor requirements, except for cassava

2/ Assuming 60 % of MT I

Source: Analisa Usaha Tani Tanaman Palawija, Dinas Pertanian, Kab. Wonogiri, 2004 & 2005

Table 4.8.4 Economic Crop Budget of Seasonal Crops per Ha in With-project Condition

Cropping Season: MT I			Maize (Hybrid)			Groundnut			Cassava: Current			Termeric (Kunyit)		
Production (ton)	Unit	Amount (Rp.000)	Q'ty	Unit Price (Rp.000)	Amount (Rp.000)	Q'ty	Unit Price (Rp.000)	Amount (Rp.000)	Q'ty	Unit Price (Rp.000)	Amount (Rp.000)	Q'ty	Unit Price (Rp.000)	Amount (Rp.000)
Development/Production Costs		5.5			1.2			14.0			13.5			13.5
1. Materials		1.17			5.5			0.15			0.6			0.6
Seed	kg	6.44			6.60			2.10			8.10			8.10
Fertilizer Urea	kg	1,905	17	27.0	459	100	10.0	1,870	10,000	0.0	280	800	3.0	2,400
TSP	kg	675	250	2.7	180	100	1.8	180	50	2.7	135	100	2.7	270
KCL	kg	180	100	1.8	75	50	1.5	75	25	1.8	45	50	1.8	90
Compost	ton	400	2	200	400	2	200	400			0	2	200	400
Dolomite	ton	0			0	1	100	0			0			0
Rhizobium	g	0.2	0	0.2	0	150	30	0			0			0
Pesticide	kg	8	2	100	16	1	100	0			0	3	7	21
Labor 1/	lit	1,688	1	100	100			0			0			0
Land Preparation		338	25	13.5	338	25	13.5	338	25	13.5	338	25	13.5	338
Family	mandays	230	17	13.5	230	17	13.5	230	17	13.5	230	17	13.5	230
Hired	mandays	108	8	13.5	108	8	13.5	108	8	13.5	108	8	13.5	108
Farm Management & Harvest		1,350	100	13.5	945	70	13.5	945	70	13.5	945	70	13.5	945
Family	mandays	70	5	14.0	70	5	14.0	70	5	14.0	70	5	14.0	70
Hired	mandays	405	30	13.5	405	30	13.5	405	30	13.5	405	30	13.5	405
Total Labor		153	125	13.5	153	125	13.5	153	125	13.5	153	125	13.5	153
Family	mandays	87	87	100	87	107	100	87	107	100	87	107	100	87
Hired	mandays	38	38	100	38	46	100	38	46	100	38	46	100	38
Threshing/Shelling	machineday	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous Costs (1+2+3) x 10%		359			359			394			129			471
Total Costs (Rp.000)		3,952			3,952			4,329			1,422			5,182
Net Return (Rp. Million)		2.48	39%		2.48	34%		2.27	32%		0.68	36%		2.92

Note: Crop budget indicated in bold letters applied for the present study

Cropping Season: MT II			Groundnut		
Production (ton)	Unit	Amount (Rp.000)	Q'ty	Unit Price (Rp.000)	Amount (Rp.000)
Development/Production Costs		0.9			0.9
1. Materials		5.5			5.5
Seed	kg	4.95			4.95
Fertilizer 2/		1,346			1,346
Pesticide 2/		650			650
Labor 1/		696			696
Land Preparation		0			0
Family	mandays	1,877	15	13.5	203
Hired	mandays	203	11	13.5	149
Farm Management & Harvest		54	4	13.5	54
Family	mandays	1,674	124	13.5	1,674
Hired	mandays	1,161	86	13.5	1,161
Total Labor		513	38	13.5	513
Family	mandays	139	139	100	139
Hired	mandays	97	97	100	97
Threshing/Shelling	machineday	42	42	100	42
Miscellaneous Costs (1+2+3) x 10%		0			0
Total Costs (Rp.000)		322			322
Net Return (Rp. Million)		3,545	28%		1.41

Note: Crop budget indicated in bold letters applied for the present study

1/: Assuming: Family labor account for 70 % of total labor requirements, except for cassava
2/: Assuming 80 % of MT I

Source: Analisa Usaha Tani Tanaman Palawija, Dinas Pertanian, Kab. Wonogiri, 2004 & 2005

Table 4.8.5 Economic Average Crop Budget of Tree Crops for Agro-forestry

Crop	Item	Year														
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th
Mango	Production (ton)					1.4	1.8	2.6	3.1	4.4	5.3	6.4	7.7	9.2	10.0	10.0
	Unit Price (Rp.000)			0.3	0.6	0.8	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Gross Return (Rp.million)			0.15	0.36	1.12	1.98	2.86	3.41	4.84	5.83	7.04	8.47	10.12	11.00	11.00
	Dev. Cost(Rp.000)															
	Farming cost(Rp.000)	2926	2,057	2,041	2,189	2,479	2,598	2,910	3,082	3,186	3,304	3,588	3,722	4,021	4,021	4,021
	Total(Rp.000)	2,926	2,057	2,041	2,189	2,479	2,598	2,910	3,082	3,186	3,304	3,588	3,722	4,021	4,021	4,021
Rambutan	Net Return (Rp.million)	-2.93	-2.06	-1.89	-1.83	-1.36	-0.62	-0.05	0.33	1.65	2.53	3.45	4.75	6.10	6.98	6.98
	Production (ton)				0.5	1.0	2.0	3.0	4.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0
	Unit Price (Rp.000)				2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	Gross Return (Rp.million)				1.00	2.00	4.00	6.00	8.00	10.00	12.00	12.00	12.00	12.00	12.00	12.00
	Dev. Cost(Rp.000)															
	Farming cost(Rp.000)	2,552	2,775	2,527	2,445	2,194	2,958	3,265	3,265	3,265	3,265	3,265	3,265	3,265	3,265	3,265
Durian	Total(Rp.000)	2,552	2,775	2,527	2,445	2,194	2,958	3,265	3,265	3,265	3,265	3,265	3,265	3,265	3,265	3,265
	Net Return (Rp.million)	-2.55	-2.78	-2.53	-1.45	-0.19	1.04	2.74	4.74	6.74	8.74	8.74	8.74	8.74	8.74	8.74
	Production (ton)					0.7	1.0	1.5	2.0	2.5	3.0	3.5	3.5	3.5	3.5	3.5
	Unit Price (Rp.000)					5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
	Gross Return (Rp.million)					3.50	6.00	9.00	12.00	15.00	18.00	21.00	21.00	21.00	21.00	21.00
	Dev. Cost(Rp.000)															
Clove	Farming cost(Rp.000)	2910	2,525	2,552	2,552	5,041	5,500	6,545	6,281	6,281	6,914	7,004	7,004	7,004	7,004	7,004
	Total(Rp.000)	2,910	2,525	2,552	2,552	5,041	5,500	6,545	6,281	6,281	6,914	7,004	7,004	7,004	7,004	
	Net Return (Rp.million)	-2.91	-2.53	-2.55	-2.55	-1.54	0.50	2.46	5.72	8.72	11.09	14.00	14.00	14.00	14.00	14.00
	Production (kg)				10	40	80	160	180	220	260	320	320	320	360	360
	Unit Price (Rp.000)				35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
	Gross Return (Rp.million)				0.35	1.40	2.80	5.60	6.30	7.70	9.10	11.20	11.20	11.20	12.60	12.60
Cashew Nut	Dev. Cost(Rp.000)															
	Farming cost(Rp.000)	3,738	1,334	1,157	1,180	1,384	1,538	1,686	2,086	2,320	2,543	2,628	2,789	2,679	3,086	3,086
	Total(Rp.000)	3,618	1,322	1,157	1,180	1,384	1,538	1,686	2,086	2,320	2,543	2,628	2,789	2,679	3,086	3,086
	Net Return (Rp.million)	-3.62	-1.32	-1.16	-0.83	0.02	1.26	3.91	4.21	5.38	6.56	8.57	8.41	8.52	9.51	9.51
	Production (ton)				1.5	2.0	2.2	2.4	2.6	2.7	2.7	2.7	2.7	2.7	2.8	2.8
	Unit Price (Rp.000)				4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Cacao	Gross Return (Rp.million)				6.9	9.2	10.1	11.0	12.0	12.4	12.4	12.4	12.4	12.9	12.9	12.9
	Dev. Cost(Rp.000)															
	Farming cost(Rp.000)	3,180	2,963	4,257	4,554	5,053	5,113	5,143	5,143	5,143	5,612	5,612	5,612	5,612	5,612	5,612
	Total(Rp.000)	3,180	2,963	4,257	4,554	5,053	5,113	5,143	5,143	5,143	5,612	5,612	5,612	5,612	5,612	5,612
	Net Return (Rp.million)	-3.18	-2.96	-4.26	2.35	4.15	5.01	5.90	6.82	6.81	6.81	6.81	6.81	7.27	7.27	7.27
	Production (ton)				0.6	0.9	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5
Average of 6 Crops	Unit Price (Rp.000)				8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
	Gross Return (Rp.million)				5.10	7.65	11.90	11.90	11.90	11.90	11.90	12.75	12.75	12.75	12.75	12.75
	Dev. Cost(Rp.000)															
	Farming cost(Rp.000)	5,255	2,528	3,085	3,950	4,540	4,555	4,555	4,555	4,555	4,555	4,555	4,555	4,599	4,599	4,599
	Total(Rp.000)	5,255	2,528	3,085	3,950	4,540	4,555	4,555	4,555	4,555	4,555	4,555	4,555	4,599	4,599	4,599
	Net Return (Rp.million)	-5.26	-2.53	-3.09	1.15	3.11	7.35	7.35	7.35	7.35	7.35	8.15	8.15	8.15	8.15	8.15
Average of 6 Crops	Production (ton)				0.05	0.5	1.0	1.4	1.8	2.2	2.7	3.1	3.4	3.6	3.9	4.0
	Unit Price (Rp.000)				0.5	4.3	4.1	4.3	4.2	4.0	3.8	3.7	3.7	3.6	3.4	3.4
	Gross Return (Rp.million)				0.03	2.29	4.15	6.13	7.73	8.93	10.31	11.54	12.74	12.97	13.33	13.71
	Dev. Cost(Rp.000)															
	Farming cost(Rp.000)	3,427	2,364	2,603	2,812	3,449	3,710	4,017	4,069	4,069	4,203	4,366	4,449	4,499	4,530	4,598
	Total(Rp.000)	3,427	2,364	2,603	2,812	3,449	3,710	4,017	4,069	4,203	4,366	4,449	4,499	4,530	4,598	
Net Return (Rp.million)	-3.43	-2.36	-2.58	-0.53	0.70	2.42	3.72	4.86	6.11	7.18	8.29	8.47	8.80	9.11	9.11	

Source: Table 4.8.3-4.8.11

Table 4.8.6 Economic Crop Budget of Estate Crop: Cacao

Gross Return Production (ton)	Unit Price (Rp.000)	1st Year		2nd Year		3rd Year		4th Year		5th Year		6 - 10th Year		11 - 14th Year		15th Year	
		Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)
Gross Return			4,222		993		1,198		1,660		2,413		2,413		2,413		2,413
Production (ton)		1,250	3,125	120	300	0	0	0	0	0	0	0	0	0	0	0	0
Unit Price (Rp.000)		2.5															
Gross Return (Rp. million)																	
Development/Production Costs	Unit																
1. Materials																	
Seedling	trees	1,250	3,125	120	300	0	0	0	0	0	0	0	0	0	0	0	0
Lamtoro	trees	0.5	300	150	0	0	0	0	0	0	0	0	0	0	0	0	0
Gliricida	trees	0.5	300	150	0	0	0	0	0	0	0	0	0	0	0	0	0
Seeds of Temporary Shadow	kg	15	15	225	0	0	0	0	0	0	0	0	0	0	0	0	0
Stick	stick	4.0	18	72	0	0	0	0	0	0	0	0	0	0	0	0	0
Fertilizer																	
NPK	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urea	kg	2.7	0	0	22	59	55	149	100	270	230	621	230	621	230	621	230
TSP	kg	1.8	0	0	20	36	52	94	100	180	212	382	212	382	212	382	212
KCL	kg	1.5	0	0	25	38	64	96	100	150	100	150	100	150	100	150	100
Compost	ton	200	3	500	3	500	4	800	5	1,000	6	1,200	6	1,200	6	1,200	6
Pesticide	l	30	0	0	2	60	2	60	2	60	2	60	2	60	2	60	2
2. Equipment & Tool																	
Sprayer	unit	15	1	15	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	packet	90	0	0	1	90	0	0	0	0	0	0	0	0	0	0	0
3. Labor																	
3.1 Development																	
Family	mandays																
Hired	mandays																
3.2 Farm Operation																	
Family	mandays	40	540	90	1,215	119	1,607	143	1,931	127	1,715	128	1,728	131	1,769	131	1,769
Hired	mandays	40	540	90	1,215	119	1,607	136	1,836	117	1,580	117	1,580	117	1,580	117	1,580
1) Management																	
Family	mandays	13.5	40	540	90	1,215	119	1,607	136	1,836	117	1,580	117	1,580	117	1,580	117
Hired	mandays	13.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2) Harvesting																	
Family	mandays	13.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hired	mandays	13.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Miscellaneous Costs (1+2+3) x 10%																	
Total Costs (Rp.000)			4,222		993		1,198		1,660		2,413		2,413		2,413		2,413
Net Return (Rp. Million)			5,255		2,528		3,085		3,950		4,540		4,555		4,599		4,599
			-5,25		-2,53		-3,09		-3,11		-7,35		-7,35		-8,15		-8,15

Source: Hasil Analisa Usaha Tan. Tanaman Perkebunan Di Jawa Tengah, 1999/2000, Dinas Perkebunan, Jawa Tengah, 2000

Table 4.8.7 Economic Crop Budget of Estate Crop : Cashew Nut

Gross Return Production (ton) Unit Price (Rp.000) Gross Return (Rp. million)	Unit	Unit Price (Rp.000)	1st Year		2nd Year		3rd Year		4th Year		5th Year		6th Year		7th Year		8th Year		9-12th Year		13-15th Year			
			Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)	Qty	Amount (Rp.000)
1. Materials			2,441		2,154		3,150		3,150		3,150		3,550		3,550		3,550		3,550		3,950		3,950	
Seed (400 trees)	kg	25	8	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stake	stick	0.5	450	225	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
String	m	0.5	100	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Seeds of Temporary Shadow Tree	kg		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Permanent Shadow Tree	stick		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fertilizer																								
NPK	kg		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Urea	kg	2.7	80	216	200	540	360	972	360	972	360	972	360	972	360	972	360	972	360	972	360	972	360	
TSP	kg	1.8	0	0	80	144	160	288	160	288	160	288	160	288	160	288	160	288	160	288	160	288	160	
KCL	kg	1.5	0	0	80	120	160	240	160	240	160	240	160	240	160	240	160	240	160	240	160	240	160	
Compost	ton	200	4	800	2	400	2	400	2	400	2	400	4	800	4	800	4	800	4	800	6	1,200	6	1,200
Pesticide	l	75	10	750	10	750	10	750	10	750	10	750	10	750	10	750	10	750	10	750	10	750	10	750
Fungicide	l	50	4	200	4	200	10	500	10	500	10	500	10	500	10	500	10	500	10	500	10	500	10	500
2. Equipment & Tool																								
Sprayer	unit		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Others	packet	180	1	180	0	0	1	180	1	180	1	180	1	180	1	180	1	180	1	180	1	180	1	
3. Labor			140	270	52	540	40	540	60	810	64	864	68	918	70	945	70	945	70	945	72	972	72	972
3.1 Development			120	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Family	mandays		84	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hired	mandays		36	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3.2 Farm Operation			20	270	40	540	40	540	60	810	64	864	68	918	70	945	70	945	70	945	72	972	72	972
1) Management			20	270	40	540	40	540	50	675	50	675	50	675	50	675	50	675	50	675	50	675	50	675
Family	mandays	13.5	20	270	40	540	40	540	50	675	50	675	50	675	50	675	50	675	50	675	50	675	50	675
Hired	mandays	13.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2) Harvesting			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Family	mandays	13.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hired	mandays	13.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4. Miscellaneous Costs (1+2+3) x 10%			289		269		387		414		459		465		468		468		468		468		468	
Total Costs (Rp.000)			3,180		2,963		4,257		4,554		5,053		5,113		5,143		5,143		5,143		5,143		5,612	
Net Return (Rp. Million)			-3.18		-2.96		-4.26		-4.15		-5.01		-5.90		-6.82		-7.27		-7.27		-7.27		-7.27	

Source: Agriculture Sectoral Report, Master Plan Study on Integrated Development & Management of Walaane-Cerranase River Basin, 2001

Table 4.8.8 Economic Crop Budget of Estate Crop: Clove (Cengkeh)

	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year	11th Year	12 & 13th Year	14-16th Year
Gross Return													
Production (kt)													
Unit Price (Rp/000)													
Gross Return (Rp. million)													
Development/Production Cost													
1. Materials													
Seedling	230	1,275	20	156	0	0	0	0	0	0	0	0	0
Seeds	0.5	300	150	0	0	0	0	0	0	0	0	0	0
Girisa	15	15	225	0	0	0	0	0	0	0	0	0	0
Seeds of Temporary Shad	4.0	18	72	0	0	0	0	0	0	0	0	0	0
Stick													
Fertilizer													
NPK	40	0	30	0	120	0	160	0	200	0	253	0	600
Urea	27	0	0	0	0	0	0	0	0	0	0	0	0
TSP	18	0	0	0	0	0	0	0	0	0	0	0	0
KCL	15	0	0	0	0	0	0	0	0	0	0	0	0
Compost	200	400	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Pesticide	10	90	0	0	0	0	0	0	0	0	0	0	0
2. Equipment & Tool													
Shaver	75	0	0	0	0	0	0	0	0	0	0	0	0
Other	90	0	0	0	0	0	0	0	0	0	0	0	0
3. Labor /													
Family	80	0	8	0	0	0	0	0	0	0	0	0	0
Hired	56	0	6	0	0	0	0	0	0	0	0	0	0
3. Farm Operation													
Management	0	270	60	810	60	810	60	810	60	810	60	810	60
1. Family	0	270	60	810	60	810	60	810	60	810	60	810	60
Hired	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Family	0	0	0	0	0	0	0	0	0	0	0	0	0
Hired	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Miscellaneous Costs (1+2+3) x 10%													
Total Costs (Rp. 000)	3,618	1,372	1,137	1,180	1,384	1,538	1,686	1,838	2,086	2,300	2,543	2,789	3,086
Net Return (Rp. Million)	-3.62	-1.32	-1.16	-0.83	-0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

Table 4.8.9 Economic Crop Budget of Fruit : Mango

Production (ton)	Unit Price (Rp.000)	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year	11th Year	12th Year	13th Year	14-15th Year
Development/Production Costs															
L. Materials	7.5	100	750	20	150	0	0	0	0	0	0	0	0	0	0
Seedling		950	1,060	910	985	985	985	985	985	1,060	1,060	1,210	1,210	1,360	1,360
Fertilizer															
Urea	2.7	0	100	270	100	270	100	270	100	270	100	270	100	270	100
TSP	1.8	0	50	90	50	90	50	90	50	90	50	90	50	90	50
KCL	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Compost	200	1	200	2	400	2	400	2	400	2	400	2	400	2	400
Pesticide	75	0	2	150	2	150	3	225	4	300	4	300	6	450	8
Equipment & Tool	1,440	1	1,440	0	0	0	0	0	0	0	0	0	0	0	0
Labor		70	270	70	810	945	80	1,080	94	1,269	102	1,377	123	1,661	129
3. Labor															
3.1 Development /		50	0	10	0	0	0	0	0	0	0	0	0	0	0
Family		35	0	7	0	0	0	0	0	0	0	0	0	0	0
Hired		15	0	3	0	0	0	0	0	0	0	0	0	0	0
3.2 Farm Operation		20	270	60	810	70	945	80	1,080	94	1,269	102	1,377	123	1,661
1) Management		20	270	60	810	60	810	60	810	60	810	60	810	60	810
Family		20	270	60	810	60	810	60	810	60	810	60	810	60	810
Hired		0	0	0	0	0	0	0	0	0	0	0	0	0	0
2) Harvesting /		0	0	0	10	135	20	270	34	459	42	567	63	831	69
Family		0	0	0	7	95	14	189	24	324	29	392	44	584	49
Hired		0	0	0	3	41	6	81	10	135	13	176	19	257	20
4. Miscellaneous Costs (1+2+3) x 10%															
Total Costs (Rp.000)		2,926	2,057	2,041	2,189	2,479	2,598	2,910	3,082	3,186	3,304	3,588	3,722	4,021	4,021
Net Return (Rp. Million)		-2.93	-2.06	-1.89	-1.83	-1.36	-0.62	-0.05	0.33	1.65	2.35	3.45	4.75	6.10	6.98

Table 4.8.10 Economic Crop Budget of Fruit: Durian

Production (ton) Unit Price (Rp.000) Gross Return (Rp. million)	Unit Price (Rp.000)	Unit	1st Year		2nd Year		3rd Year		4th Year		5th Year		6th Year		7th Year		8th Year		9th Year		10th Year		11-15th Year	
			Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)
1. Materials	10.0	trees	100	1,000	20	200	0	0	1,510	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seedling																								
Fertilizer																								
Urea	2.7	kg	75	203	60	162	60	162	60	162	150	405	175	473	175	473	175	473	175	473	175	473	175	473
TSP	1.8	kg	75	135	60	108	60	108	60	108	150	270	175	315	175	315	175	315	175	315	175	315	175	315
KCL	1.5	kg	75	113	60	90	60	90	60	90	150	225	175	263	175	263	175	263	175	263	175	263	175	263
Compost	200	ton	2	400	2	400	2	400	2	400	3	600	4	800	5	1,000	5	1,000	5	1,000	5	1,000	6	1,200
Pesticide	75	lit	7	525	7	525	10	750	10	750	15	1,125	15	1,125	20	1,500	20	1,500	20	1,500	25	1,875	25	1,875
2. Labor			70	270	70	270	60	810	60	810	145	1,958	150	2,025	160	2,160	160	2,160	160	2,160	160	2,160	160	2,160
2.1 Development I/ Family		mandays		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hired		mandays		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2 Farm Operation		mandays		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1) Management		mandays	20	270	60	810	60	810	60	810	145	1,958	150	2,025	160	2,160	160	2,160	160	2,160	160	2,160	160	2,160
Family	13.5	mandays	20	270	60	810	60	810	60	810	60	810	60	810	60	810	60	810	60	810	60	810	60	810
Hired	13.5	mandays	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2) Harvesting I/ Family	13.5	mandays	0	0	0	0	0	0	0	0	85	1,148	90	1,215	100	1,350	100	1,350	100	1,350	100	1,350	100	1,350
Hired	13.5	mandays	0	0	0	0	0	0	0	0	60	803	63	851	70	945	70	945	70	945	70	945	70	945
3. Miscellaneous Costs (1+2) x 10%		mandays		265		230		232		232		458		500		571		571		571		629		637
Total Costs (Rp.000)				2,910		2,525		2,552		2,552		5,041		5,500		6,281		6,281		6,281		6,914		7,004
Net Return (Rp. Million)				-2.91		-2.52		-2.55		-2.55		-1.54		0.50		2.72		5.72		8.72		11.09		14.00

1/: Assuming family labor accounts for 70% of total labor requirements

Source: Agriculture Sectoral Report, Master Plan Study on Integrated Development & Management of Walaue-Cenamae River Basin, 2001

Table 4.8.11 Economic Crop Budget of Fruit: Rambutan

Production (ton) Unit Price (Rp.000) Gross Return (Rp. million)	Unit	Unit Price (Rp.000)	1st Year		2nd Year		3rd Year		4th Year		5th Year		6th Year		7th Year		8th Year		9th Year		10th Year		11-15th Year		
			Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	Q'ty	Amount (Rp.000)	
1. Materials		7.5	2,050	1,713	10	75	1,488	1,413	888	880	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	
Seedling	trees		100	750	40	300																			
Fertilizer																									
Urea	kg	2.7	150	405	150	405	150	405	150	405	75	203	20	54	20	54	20	54	20	54	20	54	20	54	
TSP	kg	1.8	150	270	150	270	150	270	150	270	75	135	20	36	20	36	20	36	20	36	20	36	20	36	
KCL	kg	1.5	100	150	75	113	75	113	75	113	50	75	10	15	15	23	15	23	15	23	15	23	15	23	
Compost	ton	200	2	400	2	400	2	400	2	400	2	400	2	400	2	400	2	400	2	400	2	400	2	400	
Pesticide	l	75	1	75	3	225	3	225	3	225	1	75	5	375	7	525	7	525	7	525	7	525	7	525	
2. Labor			270	810		810	810	1,107	1,809	1,931	1,931	1,931	1,931	1,931	1,931	1,931	1,931	1,931	1,931	1,931	1,931	1,931	1,931	1,931	
2.1 Development I/			50	0	20	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Family	mandays		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hired	mandays		0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2.2 Farm Operation			20	270	60	810	60	810	60	810	82	1,107	134	1,809	143	1,931	143	1,931	143	1,931	143	1,931	143	1,931	
1) Management			20	270	60	810	60	810	60	810	60	810	60	810	60	810	60	810	60	810	60	810	60	810	
Family	mandays	13.5	20	270	60	810	60	810	60	810	60	810	60	810	60	810	60	810	60	810	60	810	60	810	
Hired	mandays	13.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2) Harvesting I/			0	0	0	0	0	0	0	0	22	297	74	999	83	1,121	83	1,121	83	1,121	83	1,121	83	1,121	
Family	mandays	13.5	0	0	0	0	0	0	0	0	15	208	52	699	58	784	58	784	58	784	58	784	58	784	
Hired	mandays	13.5	0	0	0	0	0	0	0	0	7	89	22	300	25	336	25	336	25	336	25	336	25	336	
3. Miscellaneous Costs (1+2) x 10%			232	252		230	230	222	199	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	
Total Costs (Rp.000)			2,552	2,775		2,527	2,527	2,445	2,194	2,958	2,958	2,958	2,958	2,958	2,958	2,958	2,958	2,958	2,958	2,958	2,958	2,958	2,958	2,958	
Net Return (Rp. Mflion)			-2.55	-2.77		-2.53	-2.53	-1.44	-0.19	1.04	2.74	4.74	6.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	

I/: Assuming family labor accounts for 70% of total labor requirements

Source: Agriculture Sectoral Report, Master Plan Study on Integrated Development & Management of Wainae-Cenanae River Basin, 2001 & Hasil Analisa Usaha Tani Tanaman Mangga, Dinas Pertanian Kab. Wonogiri, 2004