

Table

Table 1.1.1 Soil Distribution in Wonogiri Catchment Area

Sub-DAS	Soil Type										Total	
	Mediteran (Alfisol)		Litosol (Inceptisol)		Grumusol (Vertisol)		Latosol (Alfisol)		Ha		%	
	ha	%	ha	%	ha	%	ha	%	Ha	%	Ha	%
Keduang	17,789	42	9,487	23			14,861	35	42,137	100		
Tirtomoyo	6,951	33	9,052	43	5,085	24			21,088	100		
Temon	3,639	58			2,631	42			6,270	100		
Upper Solo	14,161	72	2,675	14	2,878	15			19,714	100		
Alang	6,150	36	5,666	33	5,152	30			16,968	100		
Wuryantoro	980	14	1,938	27	4,262	59			7,180	100		
Ngunggahan	2,663	32	2,252	27	3,349	41			8,264	100		
Residual Basin	128	4			2,734	96			2,862	100		
Land Area Total	52,461	42	31,070	25	26,091	21	14,861	12	124,483	100		
Water Surface									8,767			
Total	52,461	-	31,070	-	26,091	-	14,861	-	133,250	-		
Marent Materials	Volcanic tuff		Volcanic tuff		Volcanic tuff		Volcanic tuff		Volcanic tuff			
Physiography	Volcanic slope Volcanic piedmont		Limestone Volcanic slope Fold & uplift		Clay deposit Flat or fold Volcanic slope		Volcanic slope		Volcanic slope			

Source: Soil maps prepared by Sub Balai Rehabilitasi Lahan dan Konservasi Tanah dan Konservasi Tanah, Solo, 1985; based on a map prepared by Soil Research Institute, Bogor, 1973

Table 1.2.1 Prevailing Farming Practices in Dry Farmland (Preliminary)

Works	Cropping System: Maize + Cassava			Cropping System: Maize + Upland Rice + Cassava		
	Maize		Cassava	Maize		Cassava
	Practices	Manual	Practices	Practices	Practices	Practices
1. Land Preparation	Cropping System: Maize + Cassava			Cropping System: Maize + Upland Rice + Cassava		
	Maize		Cassava	Maize		Cassava
	Practices	Manual	Practices	Practices	Practices	Practices
	Manual			Manual		
2. Variety	Hybrid: PC/Pioneer Certified or self-multiplied	Local variety	Hybrid: PC/Pioneer Certified or self-multiplied	Local variety	Local variety	Local variety
Seed Source	Self-multiplied	Self-multiplied	Self-multiplied	Self-multiplied	Self-multiplied	Self-multiplied
3. Planting	10 kg/ha	5,000 plants/ha	7 kg/ha	2,666 plants/ha	40 kg/ha	2,666 plants/ha
Seeding Rate	100 cm x 50 cm	200 cm x 100 cm	250 cm x 150 cm	250 cm x 150 cm	20 cm x 30 cm	250 cm x 150 cm
Planting Density	1 plant/hill	1 plant/hill	2 plants/hill	1 plant/hill	3 grams/hill	1 plant/hill
Plant/Grain/Hill						
4. Fertilization	Basal dressing	Basal dressing	Basal dressing	Basal dressing	Basal dressing	Basal dressing
	Urea 100 kg/ha	50 kg/ha	75 kg/ha	20 kg/ha	30 kg/ha	Urea
	ZA	-	ZA	ZA	ZA	Urea
	KCl	-	KCl	-	KCl	ZA
	TSP	25 kg/ha	TSP	25 kg/ha	TSP	50 kg/ha
	Compost	-	Compost	-	Compost	KCl
	Top dressing	Top dressing	Top dressing	Top dressing	Top dressing	TSP
	Urea 50 kg/ha	Urea	Urea 20 kg/ha	Urea	Urea	-
	ZA	-	ZA	ZA	ZA	-
	KCl	-	KCl	-	KCl	-
	TSP	25 kg/ha	TSP	50 kg/ha	TSP	-
5. Weeding	Manual weeding	Manual weeding	Manual weeding	Manual weeding	Manual weeding	Manual weeding
	1 time	1 time	1 time	1 time	1 time	1 time
6. Agro-chemical	Herbicide	-	Herbicide	-	Herbicide	-
	Pesticide	-	Pesticide: Furadan	-	Pesticide: Furadan	-
		3 l/ha		2 l/ha		-
7. Harvesting	Manual	Manual	Manual	Manual	Manual	Manual
8. Post-harvesting	Sun drying	Sun drying	Sun drying	Sun drying	Sun drying	Sun drying
Drying	Manual	Manual	Manual	Manual	Manual	Manual
Shelling/Threshing						
9. Average Yield	2.5 t/ha	9.8 t/ha	2.2 t/ha	2.3 t/ha	2.4 t/ha	2.7 t/ha
						1.1 t/ha
						6.3 t/ha

Source: Agriculture Services Office, Wonogiri

Table 1.2.5 Monthly Cropped Area Seasonal Cropping Intensity in Dry Farmland (Tegal Pekarangan) by Kecamatan (1/3)

District / Kecamatan	Crops	Crop Year 2002/03									Crop Year 2003/04								
		2002/03 MT II				2002/03 MT III					2003/04 MT II				2003/04 MT III				
		Feb	Mar	Apr	May	June	July	Aug	Sep	Feb	Mar	Apr	May	June	July	Aug	Sep		
1. Pracimantoro	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Maize	-	257	11	-	-	-	-	-	-	11	45	-	-	-	-	-		
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Groundnut	5	1,813	449	-	-	-	-	-	686	1,616	-	-	-	-	-	-		
	Soybeans	2	1,592	393	-	-	-	-	-	523	1,602	-	-	-	-	-	-		
	Mungbeans	-	10	5	-	-	-	-	-	-	5	-	-	-	-	-	-		
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Total (ha)	7	3,672	858	0	0	0	0	0	1,220	3,268	0	0	0	0	0	0		
	Cropped Area (ha)				4,537					0			4,483				0		
Dry Farm Land (ha)				9,525															
Cropping Intensity (%)				48					0			47				0			
2. Giritontro	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Maize	-	5	3	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Groundnut	100	1,160	-	-	-	-	-	-	1,125	-	-	-	-	-	-	-		
	Soybeans	200	1,100	-	-	-	-	-	-	1,150	-	-	-	-	-	-	-		
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Total (ha)	300	2,265	3	0	0	0	0	0	2,275	0	0	0	0	0	0	0		
	Cropped Area (ha)				2,568					0			2,275				0		
Dry Farm Land (ha)				2,568															
Cropping Intensity (%)				100					0			89				0			
3. Giriwiry	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Groundnut	-	1,579	-	-	-	-	-	-	640	1,453	-	-	-	-	-	-		
	Soybeans	-	2,138	-	-	-	-	-	-	1,160	254	-	-	-	-	-	-		
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Total (ha)	0	3,717	0	0	0	0	0	0	1,800	1,707	0	0	0	0	0	0		
	Cropped Area (ha)				3,717					0			3,507				0		
Dry Farm Land (ha)				7,335															
Cropping Intensity (%)				51					0			48				0			
4. Batuwarno	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Maize	-	-	-	-	-	-	-	-	67	32	-	-	-	-	-	-		
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Groundnut	-	-	90	-	-	-	-	-	148	186	-	-	47	-	-	-		
	Soybeans	-	250	-	-	-	-	-	-	135	40	-	-	-	-	-	-		
	Mungbeans	-	-	-	-	-	-	-	-	17	-	-	-	21	-	-	-		
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Total (ha)	0	250	90	0	0	0	0	0	367	258	0	0	68	0	0	0		
	Cropped Area (ha)				340					0			625				68		
Dry Farm Land (ha)				2,995															
Cropping Intensity (%)				11					0			21				2			
5. Karangtengah	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Maize	-	1,428	233	-	-	-	-	-	201	283	49	-	-	-	-	-		
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Groundnut	-	761	58	-	-	-	-	-	574	177	35	-	-	-	-	-		
	Soybeans	-	500	175	-	-	-	-	-	296	167	46	-	-	-	-	-		
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sweet Potato	63	42	16	-	-	-	-	-	19	21	-	4	2	-	3	-		
	Total (ha)	63	2,731	482	0	0	0	0	0	1,090	648	130	4	2	0	3	0		
	Cropped Area (ha)				3,276					0			1,372				5		
Dry Farm Land (ha)				3,754															
Cropping Intensity (%)				87					0			50				0.1			
6. Tirtomoyo	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Maize	250	-	-	-	-	-	-	-	-	250	-	-	-	-	-	-		
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Groundnut	1,100	-	-	-	-	-	-	-	-	1,100	-	-	-	-	-	-		
	Soybeans	-	25	-	-	-	-	-	-	-	25	-	-	-	-	-	-		
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Total (ha)	1,350	25	0	0	0	0	0	0	0	1,375	0	0	0	0	0	0		
	Cropped Area (ha)				1,375					0			1,375				0		
Dry Farm Land (ha)				5,369															
Cropping Intensity (%)				26					0			26				0			
7. Nguntoronadi	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-		
	Maize	-	9	-	-	-	-	-	-	23	-	-	-	-	-	-	-		
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Groundnut	-	763	-	-	-	-	-	-	532	-	-	-	-	8	-	-		
	Soybeans	-	3	-	-	-	-	-	-	12	-	-	-	-	-	-	-		
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Total (ha)	0	775	0	0	0	0	0	0	567	0	0	0	0	24	15	0		
	Cropped Area (ha)				775					0			567				39		
Dry Farm Land (ha)				2,098															
Cropping Intensity (%)				37					0			27				2			

Table 1.2.5 Monthly Cropped Area Seasonal Cropping Intensity in Dry Farmland (Tegal Pekarangan) by Kecamatan (2/3)

District / Kecamatan	Crops	Crop Year 2002/03								Crop Year 2003/04							
		2002/03 MT II				2002/03 MT III				2003/04 MT II				2003/04 MT III			
		Feb	Mar	Apr	May	June	July	Aug	Sep	Feb	Mar	Apr	May	June	July	Aug	Sep
8. Baturetno	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Maize	-	-	125	-	-	-	-	-	-	-	125	-	-	-	-	
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Groundnut	-	75	-	-	-	-	-	-	50	185	-	-	-	-	-	
	Soybeans	-	50	-	-	-	-	-	-	-	125	-	-	-	-	-	
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total (ha)		0	125	125	0	0	0	0	0	50	435	0	0	0	0	0	
Cropped Area (ha)					250							485					
Dry Farm Land (ha)					2,862												
Cropping Intensity (%)					9				0			17				0	
9. Eromoko	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Maize	-	-	-	-	-	-	-	-	110	-	-	-	-	-	-	
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Groundnut	-	-	1,608	-	-	-	-	-	948	-	-	-	-	-	-	
	Soybeans	-	-	-	-	-	-	-	-	507	-	-	-	-	-	-	
	Mungbeans	-	-	-	-	-	-	-	-	32	-	-	-	-	-	-	
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total (ha)		0	0	1,608	0	0	0	0	0	1,597	0	0	0	0	0	0	
Cropped Area (ha)					1,608				0			1,597				0	
Dry Farm Land (ha)					7,458												
Cropping Intensity (%)					22				0			21				0	
10. Wuryantoro	Upland Rice	-	-	-	-	25	45	-	-	-	-	-	60	85	-	-	
	Maize	-	-	-	-	30	50	120	-	-	-	-	90	65	-	119	145
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	-	255	-	-	7	5	28	-	850	25	-	25	85	-	80	-
	Soybeans	-	725	-	-	-	-	-	-	360	340	-	15	25	-	10	-
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sorghum	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	115	-	-	-
Total (ha)		0	980	0	0	75	100	148	0	1,210	365	0	130	350	85	209	145
Cropped Area (ha)					980				323			1,705					789
Dry Farm Land (ha)					2,152												
Cropping Intensity (%)					46				15			79					37
11. Manyaran	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Maize	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	-	624	477	-	-	-	-	-	654	-	-	-	-	-	-	-
	Soybeans	-	586	28	-	-	-	-	-	534	144	-	-	-	-	-	-
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total (ha)		0	1,210	510	0	0	0	0	0	1,188	144	0	0	0	0	0	0
Cropped Area (ha)					1,720				0			1,332					0
Dry Farm Land (ha)					4,939												
Cropping Intensity (%)					35				0			27					0
12. Selogiri	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	-	200	-	-	-	-	-	-	230	-	-	-	-	-	-	-
	Soybeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total (ha)		0	200	0	0	0	0	0	0	230	0	0	0	0	0	0	0
Cropped Area (ha)					200				0			230					0
Dry Farm Land (ha)					602												
Cropping Intensity (%)					33				0			38					0
13. Wonogiri	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Maize	-	-	-	-	10	-	-	-	-	-	-	-	15	-	-	-
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	-	2,012	-	-	10	-	-	-	2,085	-	-	-	-	15	-	-
	Soybeans	-	15	-	-	-	-	-	-	50	-	-	-	-	-	-	-
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total (ha)		0	2,027	0	0	20	0	0	0	2,135	0	0	0	0	30	0	0
Cropped Area (ha)					2,027				20			2,135					30
Dry Farm Land (ha)					4,729												
Cropping Intensity (%)					43				0			45					1
14. Ngadirojo	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	-	3,500	-	-	-	-	-	-	5,600	-	-	-	-	-	-	-
	Soybeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sweet Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total (ha)		0	3,500	0	0	0	0	0	0	5,600	0	0	0	0	0	0	0
Cropped Area (ha)					3,500				0			5,600					0
Dry Farm Land (ha)					6,430												
Cropping Intensity (%)					54				0			87					0

Table 1.2.5 Monthly Cropped Area Seasonal Cropping Intensity in Dry Farmland (Tegal Pekarangan) by Kecamatan (3/3)

District / Kecamatan	Crops	Crop Year 2002/03								Crop Year 2003/04							
		2002/03 MT II				2002/03 MT III				2003/04 MT II				2003/04 MT III			
		Feb	Mar	Apr	May	June	July	Aug	Sep	Feb	Mar	Apr	May	June	July	Aug	Sep
15. Sidoharjo	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Maize	-	-	-	-	-	-	-	-	125	4	-	-	-	-	-	-
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	-	1,045	67	-	-	-	-	-	460	462	-	-	-	-	-	-
	Soybeans	-	46	-	-	-	-	-	-	6	9	-	-	-	-	-	-
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sweat Potato	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total (ha)	0	1,094	67	0	0	0	0	0	591	475	0	0	0	0	0	
	Cropped Area (ha)				1,161				0				1,066				
	Dry Farm Land (ha)				2,858												
	Cropping Intensity (%)				41				0				37			0	
16. Jatiroto	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Maize	-	12	-	-	2	-	-	-	-	-	6	-	-	-	-	-
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	-	1,357	-	-	13	-	-	-	1,454	-	-	-	7	-	-	-
	Soybeans	-	7	-	-	-	-	-	-	11	-	-	-	-	-	-	-
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sweat Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total (ha)	0	1,376	0	0	15	0	0	0	1,465	6	0	0	7	0	0	
	Cropped Area (ha)				1,376				15				1,471				
	Dry Farm Land (ha)				3,305											7	
	Cropping Intensity (%)				42				0				45			0	
17. Slogohimo	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Maize	-	1	-	-	-	-	-	-	12	-	-	-	-	-	-	-
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	-	760	-	-	-	-	-	-	315	-	-	-	-	-	-	-
	Soybeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sweat Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total (ha)	0	761	0	0	0	0	0	0	327	0	0	0	0	0	0	
	Cropped Area (ha)				761				0				327				
	Dry Farm Land (ha)				3,092												
	Cropping Intensity (%)				25				0				11			0	
18. Jatisono	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Maize	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	-	-	-	-	-	-	-	-	642	-	-	-	-	-	-	-
	Soybeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sweat Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total (ha)	0	0	0	0	0	0	0	0	642	0	0	0	0	0	0	
	Cropped Area (ha)				0				0				642				
	Dry Farm Land (ha)				1,460												
	Cropping Intensity (%)				0				0				44			0	
19. Jatipurno	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Maize	-	65	-	-	-	-	-	-	132	-	-	-	-	-	-	-
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	-	71	-	-	-	-	-	-	107	-	-	-	-	-	-	-
	Soybeans	-	30	-	-	-	-	-	-	45	-	-	-	-	-	-	-
	Mungbeans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sweat Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total (ha)	0	166	0	0	0	0	0	0	284	0	0	0	0	0	0	
	Cropped Area (ha)				166				0				284				
	Dry Farm Land (ha)				2,390												
	Cropping Intensity (%)				7				0				12			0	
20. Girimarto	Upland Rice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Maize	-	360	-	-	-	-	-	-	50	-	-	-	-	-	-	-
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	-	600	-	-	-	-	-	-	114	-	-	-	-	-	-	-
	Soybeans	-	15	-	-	-	-	-	-	15	-	-	-	-	-	-	-
	Mungbeans	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sweat Potato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total (ha)	0	979	0	0	0	0	0	0	179	0	0	0	0	0	0	
	Cropped Area (ha)				979				0				179				
	Dry Farm Land (ha)				3,334												
	Cropping Intensity (%)				29				0				5			0	
DAS in Wonogiri 2/	Upland Rice	-	-	-	-	25	45	-	-	-	-	-	-	60	85	15	-
	Maize	250	2,137	377	-	42	50	120	-	731	745	49	90	65	31	119	145
	Cassava	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundnut	1,205	16,575	2,749	-	30	5	28	-	17,214	5,204	35	25	139	23	80	-
	Soybeans	202	7,082	596	-	-	-	-	-	4,804	2,706	46	15	25	-	10	-
	Mungbeans	-	14	5	-	-	-	-	-	49	5	-	-	21	-	-	-
	Sorghum	-	-	-	-	13	-	-	-	-	-	-	-	115	-	-	-
	Sweat Potato	63	45	16	-	-	-	-	-	19	21	-	4	2	-	3	-
	Total (ha)	1,657	25,808	3,727	29	110	100	148	0	22,798	8,660	130	135	425	139	224	145
	Cropped Area (ha)				31,221				358				31,723				933
	Dry Farm Land (ha)				79,255												
	Cropping Intensity (%)				39				0.5				40				1

1/: Wonogiri kecamatans located in DAS Wonogiri (Project kecamatans)

2/: Total of Project kecamatans

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

Table 1.2.6 Prevailing Farming Practices in Dry Farmland (Preliminary)

Works	Cropping System: Maize + Cassava			Cropping System: Maize + Upland Rice			Cropping System: Maize + Groundnut + Cassava			Cropping System: Maize + Upland Rice + Cassava		
	Maize Practices	Cassava Practices	Manual	Upland Rice Practices	Maize Practices	Manual	Groundnut Practices	Cassava Practices	Maize Practices	Soybeans Practices	Cassava Practices	
	Manual			Manual			Manual					
1. Land Preparation	Hybrid: PC/Pioneer Certified or self-multiplied	Local variety Self-multiplied	Manual	Slegreng Self-multiplied or local market	Hybrid: PC/Pioneer Certified or self-multiplied	Kidang/Wilis Self-multiplied or local market	Local variety Self-multiplied or local market	Hybrid: PC/Pioneer Certified or self-multiplied	Lokon Self-multiplied or local market	Local variety Self-multiplied		
2. Variety	10 kg/ha	5 000 plants/ha		35 kg/ha	10 kg/ha	55 kg/ha	2 666 plants/ha	7 kg/ha	40 kg/ha	2 666 plants/ha		
Seeding Rate	100 cm x 50 cm	200 cm x 100 cm		20 cm x 20 cm	100 cm x 60 cm	20 cm x 30 cm	250 cm x 150 cm	250 cm x 150 cm	20 cm x 30 cm	250 cm x 150 cm		
Planting Density	1 plant/hill	1 plant/hill		1 plant/hill	1 plant/hill	1 plant/hill	1 plant/hill	2 plants/hill	3 grains/hill	1 plant/hill		
3. Planting												
4. Fertilization	Basal dressing Urea 100 kg/ha ZA - KCl - TSP 50 kg/ha	Basal dressing Urea 50 kg/ha ZA - KCl - TSP 25 kg/ha		Basal dressing Urea 75 kg/ha ZA - KCl - TSP 50 kg/ha	Basal dressing Urea 25 kg/ha ZA - KCl - TSP 25 kg/ha	Basal dressing Urea 20 kg/ha ZA - KCl - TSP 25 kg/ha	Basal dressing Urea 10 kg/ha ZA - KCl - TSP 25 kg/ha	Basal dressing Urea 30 kg/ha ZA - KCl - TSP 75 kg/ha	Basal dressing Urea - ZA - KCl - TSP 50 kg/ha	Basal dressing Urea - ZA - KCl - TSP 50 kg/ha		
	Compost - Top dressing Urea 50 kg/ha	Compost - Top dressing Urea - ZA - KCl - TSP 25 kg/ha		Compost - Top dressing Urea 75 kg/ha	Compost - Top dressing Urea 25 kg/ha	Compost - Top dressing Urea - ZA - KCl - TSP 50 kg/ha	Compost - Top dressing Urea - ZA - KCl - TSP 25 kg/ha	Compost - Top dressing Urea 20 kg/ha	Compost - Top dressing Urea - ZA - KCl - TSP 25 kg/ha	Compost - Top dressing Urea - ZA - KCl - TSP 25 kg/ha		
5. Weeding	Manual weeding 1 time	Manual weeding 1 time		Manual weeding 1 time	Manual weeding 1 time	Manual weeding 1 time	Manual weeding 1 time	Manual weeding 1 time	Manual weeding 1 time	Manual weeding 1 time		
6. Agro-chemical	Herbicide - Pesticide: -	Herbicide - Pesticide: -		Herbicide - Pesticide: Furdan 3 l/ha	Herbicide - Pesticide: Furdan 2 l/ha	Herbicide - Pesticide: -	Herbicide - Pesticide: -	Herbicide - Pesticide: -	Herbicide - Pesticide: -	Herbicide - Pesticide: -		
7. Harvesting	Manual	Manual		Manual	Manual	Manual	Manual	Manual	Manual	Manual		
8. Post-harvesting	Sun drying Manual	Sun drying		Sun drying Pedal thresher	Sun drying Manual	Sun drying Manual	Sun drying	Sun drying Manual	Sun drying Manual	Sun drying Manual		
9. Average Yield	2.5 t/ha	9.8 t/ha		2.2 t/ha	2.3 t/ha	2.4 t/ha	2.4 t/ha	2.7 t/ha	1.1 t/ha	6.3 t/ha		

Source: Agriculture Services Office, Wonogiri

Table 1.2.7 Harvested Area, Productivity and Production of Seasonal Crops by Kecamatan in DAS Wonogiri from 2001 to 2003 (1/2)

Kabupaten/ Kecamatan	Year	Paddy			Upland Rice			Maize			Cassava			Groundnut			Soybeans			Sorghum		
		Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)
1. Praci mantoro	2001	1,044	5,277	5.1	3,072	9,351	3.0	7,252	28,023	3.9	6,491	103,092	15.9	2,667	2,986	1.1	5,337	5,884	1.1	1,162	1,258	1.1
	2002	1,118	5,641	5.0	2,685	8,173	3.0	5,654	34,115	6.0	6,747	88,822	13.2	2,600	2,650	1.0	4,466	4,523	1.0			
	2003	700	3,532	5.0	2,562	7,799	3.0	5,591	17,489	3.1	6,273	70,728	11.3	1,836	1,452	0.8	2,419	2,126	0.9	1,005	1,088	1.1
	Average	954	4,817	5.0	2,773	8,441	3.0	6,166	26,542	4.3	6,504	87,547	13.5	2,368	2,363	1.0	4,074	4,178	1.0	1,084	1,173	1.1
	2001	90	454	5.0	1,276	3,407	2.7	2,173	6,088	2.8	2,240	16,726	13.5	1,664	1,630	1.0	1,672	1,683	1.0	51	55	1.1
2. Giritontro	2002	90	454	5.0	1,628	4,347	2.7	2,221	10,449	4.7	2,153	40,751	18.9	1,552	1,569	1.0	1,657	2,067	1.2			
	2003	75	378	5.0	1,645	4,392	2.7	2,180	6,566	3.0	2,101	35,689	17.0	966	888	0.9	891	802	0.9	155	159	1.0
	Average	85	429	5.0	1,516	4,049	2.7	2,191	7,701	3.5	1,831	31,055	17.0	1,394	1,362	1.0	1,407	1,517	1.1	103	107	1.0
	2001	1,697	8,701	5.1	1,545	5,085	3.3	4,851	14,362	3.0	3,775	49,218	13.0	2,863	3,050	1.1	4,287	5,490	1.3	201	206	1.0
	2002	2,038	10,449	5.1	1,547	5,091	3.3	4,684	20,177	4.3	3,775	53,291	14.1	2,865	2,963	1.0	3,970	5,275	1.3			
3. Giriwiryo	2003	1,165	5,973	5.1	1,662	5,470	3.3	4,620	22,638	4.9	3,774	47,559	12.6	2,968	3,579	1.2	3,857	4,061	1.1			
	Average	1,633	8,374	5.1	1,585	5,215	3.3	4,718	19,059	4.0	3,775	50,023	13.3	2,899	3,197	1.1	4,038	4,942	1.2	201	206	1.0
	2001	710	3,583	5.0	911	2,746	3.0	2,247	6,383	2.8	2,879	35,421	12.3	394	423	1.1	1,466	1,502	1.0			
	2002	713	3,598	5.0	910	2,743	3.0	2,245	6,383	2.8	2,879	35,421	12.3	394	423	1.1	1,466	1,502	1.0			
	2003	695	3,507	5.0	910	2,743	3.0	2,182	9,869	4.5	3,180	55,403	17.4	340	341	1.0	869	975	1.1	0	0	
4. Batuwarno	Average	706	3,563	5.0	910	2,744	3.0	2,225	9,382	4.2	2,913	44,224	15.2	393	407	1.0	1,234	1,325	1.1			
	2001	926	5,056	5.5	1,146	3,80	2.6	5,178	17,795	3.4	4,679	51,874	11.1	1,339	1,553	1.2	1,295	1,509	1.2			
	2002	960	5,242	5.5	476	1,239	2.6	5,731	23,838	4.2	4,350	63,422	14.6	2,017	2,014	1.0	1,415	1,594	1.1			
	2003	961	4,978	5.2	481	1,252	2.6	6,824	21,380	3.1	5,068	63,442	12.5	2,219	3,757	1.7	1,713	2,287	1.3	0	0	
	Average	949	5,092	5.4	368	957	2.6	5,911	21,004	3.6	4,696	59,579	12.7	1,858	2,441	1.3	1,474	1,797	1.2			
5. Karangtengah	2001	1,476	8,054	5.5	750	2,328	3.1	4,430	18,359	4.1	4,450	63,950	14.4	1,312	1,325	1.0	1,880	1,893	1.0			
	2002	1,345	7,339	5.5	900	2,794	3.1	2,815	12,061	4.3	5,100	71,368	14.0	2,117	2,089	1.0	722	744	1.0			
	2003	1,335	7,285	5.5	815	2,530	3.1	2,970	7,796	2.7	5,100	86,491	17.0	2,308	2,557	1.1	201	260	1.3	0	0	
	Average	1,385	7,559	5.5	822	2,551	3.1	3,388	12,739	3.8	4,883	73,936	15.1	1,912	1,990	1.0	934	966	1.0			
	2001	1,842	9,553	5.2	1,025	2,890	2.8	1,981	6,022	3.0	6,272	40,034	15.0	2,257	2,443	1.1	407	426	1.0			
6. Tiromoyo	2002	2,950	15,299	5.2	1,025	2,890	2.8	2,025	8,139	4.0	2,117	24,062	11.4	2,460	2,499	1.0	278	271	1.0			
	2003	947	4,911	5.2	183	516	2.8				1,855	25,280	13.6	1,506	1,740	1.2	18	20	1.1	0	0	
	Average	913	9,921	5.2	744	2,099	2.8	2,093	7,081	3.5	2,215	29,792	13.5	2,074	2,227	1.1	234	239	1.0			
	2001	2,164	12,162	5.6	0	0		1,267	4,032	3.2	1,275	17,210	13.5	622	696	1.1	2,095	2,740	1.3			
	2002	1,936	10,880	5.6	0	0		971	4,254	4.4	1,125	12,148	10.8	482	484	1.0	2,040	2,547	1.2			
7. Nguntoronadi	2003	2,138	12,016	5.6	0	0		1,178	5,889	5.0	1,125	11,205	10.0	479	583	1.2	1,030	1,606	1.6	0	0	
	Average	2,079	11,686	5.6	0	0		1,139	4,725	4.1	1,175	13,521	11.5	528	588	1.1	1,722	2,298	1.3			
	2001	2,134	11,003	5.2	1,069	3,417	3.2	2,410	8,504	3.5	4,302	57,479	13.4	1,973	2,344	1.2	636	655	1.0			
	2002	2,269	11,699	5.2	1,069	3,417	3.2	5,408	26,110	4.8	4,102	44,795	10.9	3,181	3,366	1.1	2,662	3,549	1.3			
	2003	1,611	8,306	5.2	697	2,228	3.2	5,461	22,106	4.0	4,102	75,428	18.4	3,422	2,803	0.8	1,990	1,765	0.9	0	0	
8. Baturetino	Average	2,005	10,336	5.2	826	2,641	3.2	4,426	18,907	4.3	4,169	59,234	14.2	2,859	2,838	1.0	1,763	1,990	1.1			
	2001	1,209	6,602	5.5	130	405	3.1	2,140	6,189	2.9	2,210	37,407	16.9	215	230	1.1	3,228	3,591	1.1	207	216	1.0
	2002	1,417	7,737	5.5	80	249	3.1	1,997	9,145	4.6	2,015	23,883	11.9	546	618	1.1	2,735	3,596	1.3			
	2003	1,131	6,175	5.5	190	592	3.1	1,940	8,342	4.3	2,010	35,099	17.5	611	695	1.1	2,507	2,622	1.0	230	261	1.0
	Average	1,252	6,838	5.5	133	415	3.1	2,026	7,892	3.9	2,078	32,130	15.5	457	514	1.1	2,823	3,203	1.1	229	239	1.0
9. Eromoko	2001	1,656	8,554	5.2	261	835	3.2	3,006	9,026	3.0	3,396	53,567	15.8	1,418	1,497	1.1	4,352	4,446	1.0			
	2002	1,739	9,092	5.2	264	845	3.2	3,067	14,313	4.7	3,255	51,246	15.7	1,608	1,778	1.1	4,240	5,522	1.3			
	2003	1,408	7,361	5.2	86	275	3.2	3,073	5,624	1.8	3,267	41,707	12.8	2,698	2,663	1.0	3,281	4,095	1.2	0	0	
	Average	1,594	8,336	5.2	204	652	3.2	3,049	9,654	3.2	3,306	48,840	14.8	1,908	1,979	1.0	3,958	4,688	1.2			
	2001	3,873	22,725	5.9	0	0		586	8,028	13.7	586	8,028	13.7	403	435	1.1	15	16	1.1			
10. Wuryantoro	2002	4,053	24,006	5.9	0	0		194	848	4.4	586	9,249	15.8	346	332	1.0	6	6	1.0			
	2003	3,108	18,409	5.9	0	0		199	706	3.5	535	10,608	19.8	258	317	1.2	0	0				
	Average	3,666	21,713	5.9	0	0		212	856	4.0	569	9,295	16.3	336	361	1.1	7	7	1.0			
	2001	1,417	7,737	5.5	80	249	3.1	1,997	9,145	4.6	2,015	23,883	11.9	546	618	1.1	2,735	3,596	1.3			
	2002	1,131	6,175	5.5	190	592	3.1	1,940	8,342	4.3	2,010	35,099	17.5	611	695	1.1	2,507	2,622	1.0	230	261	1.0
11. Manyaran	Average	1,252	6,838	5.5	133	415	3.1	2,026	7,892	3.9	2,078	32,130	15.5	457	514	1.1	2,823	3,203	1.1	229	239	1.0
	2001	1,656	8,554	5.2	261	835	3.2	3,006	9,026	3.0	3,396	53,567	15.8	1,418	1,497	1.1	4,352	4,446	1.0			
	2002	1,739	9,092	5.2	264	845	3.2	3,067	14,313	4.7	3,255	51,246	15.7	1,608	1,778	1.1	4,240	5,522	1.3			
	2003	1,408	7,361	5.2	86	275	3.2	3,073	5,624	1.8	3,267	41,707	12.8	2,698	2,663	1.0	3,281	4,095	1.2	0	0	
	Average	1,594	8,336	5.2	204	652	3.2	3,049	9,654	3.2												

Table 1.2.7 Harvested Area, Productivity and Production of Seasonal Crops by Kecamatan in DAS Wonogiri from 2001 to 2003 (2/2)

Kabupaten/ Kecamatan	Year	Paddy			Upland Rice			Maize			Cassava			Groundnut			Soybeans			Sorghum			
		Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	Harvested Area (ha)	Production (t)	Unit Yield (t/ha)	
Kab. Wonogiri	2001	1,918	10,258	5.3	110	322	2.9	2,584	8,881	3.4	3,029	41,394	13.7	4,410	5,147	1.2	66	72	1.1				
	2002	1,968	10,525	5.3	135	395	2.9	2,566	10,164	4.0	2,785	33,643	12.1	4,413	4,048	0.9	59	63	1.1				
	2003	1,318	7,049	5.3	135	395	2.9	2,586	7,437	2.9	2,784	50,460	18.1	4,464	4,352	1.0	82	73	0.9				
	Average	1,735	9,277	5.3	127	371	2.9	2,579	8,827	3.4	2,866	41,832	14.6	4,429	4,516	1.0	69	69	1.0				
	2001	607	3,138	5.2	3,325	8,974	2.7	3,852	15,812	4.1	3,700	59,411	16.1	6,675	8,533	1.3	51	55	1.1				
14. Ngadirojo	2002	1,397	7,223	5.2	3,325	8,974	2.7	3,316	17,633	5.3	3,500	38,225	10.9	6,678	7,030	1.1	14	14	1.1				
	2003	695	3,593	5.2	225	607	2.7	3,451	15,350	4.4	3,500	58,951	16.8	3,920	4,645	1.2	0	0	0				
	Average	900	4,651	5.2	2,292	6,185	2.7	3,540	16,265	4.6	3,567	52,196	14.6	5,758	6,736	1.2	22	23	1.1				
	2001	2,444	13,245	5.4	234	656	2.8	2,866	11,858	4.1	2,218	35,339	15.9	2,276	2,850	1.3	603	655	1.1				
	2002	2,444	13,244	5.4	170	477	2.8	2,866	11,858	4.1	2,092	26,666	12.7	2,695	2,572	1.0	392	475	1.2				
15. Sidoharjo	2003	1,895	10,269	5.4	241	676	2.8	2,426	8,649	3.6	1,800	28,161	15.6	2,735	3,320	1.2	170	164	1.0				
	Average	2,261	12,253	5.4	215	603	2.8	2,646	10,254	3.9	2,037	30,055	14.8	2,569	2,914	1.1	388	431	1.1				
	2001	975	5,003	5.1	67	220	3.3	3,284	15,130	4.6	3,117	52,514	16.8	2,457	3,164	1.3	647	678	1.0				
	2002	771	3,957	5.1	55	187	3.4	3,217	20,786	6.5	3,178	40,283	12.7	2,068	2,103	1.0	24	25	1.0				
	2003	613	3,146	5.1	67	220	3.3	4,245	32,725	7.7	3,460	37,509	10.8	2,332	2,654	1.1	31	35	1.1				
17. Slogohimo	Average	786	4,035	5.1	63	209	3.3	3,582	22,880	6.4	3,252	43,435	13.4	2,286	2,640	1.2	234	246	1.1				
	2001	3,319	18,819	5.7	491	1,404	2.9	2,555	12,350	4.8	2,600	35,161	13.5	697	794	1.1	5	5	1.0				
	2002	3,293	18,671	5.7	491	1,404	2.9	2,603	15,822	6.1	2,428	34,203	14.1	1,007	1,103	1.0	8	10	1.3				
	2003	2,467	13,988	5.7	491	1,404	2.9	3,699	16,871	4.6	2,710	32,859	12.1	1,546	1,596	1.0	0	0	0				
	Average	3,026	17,159	5.7	491	1,404	2.9	2,952	15,014	5.1	2,579	34,074	13.2	1,083	1,164	1.1	4	5	1.2				
18. Jatirojo	2001	2,230	12,536	5.6	56	187	3.4	2,366	8,373	3.5	1,925	28,215	14.7	955	1,127	1.2							
	2002	2,120	11,919	5.6	28	87	3.1	2,004	17,663	8.8	1,862	25,697	13.8	510	552	1.1	7	7	1.0				
	2003	1,643	9,237	5.6	0	0	0	2,103	10,172	4.8	1,881	36,275	19.3	775	925	1.2	0	0	0				
	Average	1,998	11,231	5.6	14	44	3.1	2,158	12,069	5.6	1,889	30,062	15.9	747	868	1.2	4	4	1.0				
	2001	2,079	11,215	5.4	23	74	3.2	853	3,016	3.5	1,812	22,661	12.5	167	187	1.1	184	202	1.1				
19. Jatipurno	2002	1,831	9,876	5.4	3	3	3.0	866	4,808	5.6	1,791	28,364	15.8	390	456	1.2	93	103	1.1				
	2003	1,545	8,334	5.4	0	0	0	931	2,436	2.6	1,762	18,418	10.5	155	165	1.1	129	119	0.9				
	Average	818	9,808	5.4	8	26	3.2	883	3,430	3.9	1,788	23,148	12.9	237	269	1.1	135	141	1.0				
	2001	3,580	18,545	5.2	50	134	2.7	1,805	7,641	4.2	1,598	20,304	12.7	439	522	1.2	58	61	1.1				
	2002	3,724	19,290	5.2	75	201	2.7	1,886	9,923	5.3	1,787	28,757	16.1	798	842	1.1	43	53	1.2				
20. Giritmarto	2003	2,859	15,610	5.5	25	67	2.7	1,747	4,616	2.6	1,797	34,912	19.4	1,744	2,916	1.7	39	35	0.9				
	Average	3,388	17,815	5.3	50	134	2.7	1,813	7,393	4.1	1,727	27,991	16.2	994	1,427	1.4	47	50	1.1				
	2001	35,917	194,483	5.4	13,994	41,224	2.9	57,343	208,859	3.6	57,954	829,005	14.3	35,203	40,936	1.2	28,284	31,363	1.1				
	2002	38,176	206,141	5.4	14,508	42,378	2.9	53,470	272,143	3.1	57,427	780,722	13.6	38,777	39,525	1.0	26,198	31,942	1.2				
	2003	28,309	154,057	5.4	9,924	29,762	3.0	57,356	226,661	4.0	58,076	856,184	14.7	37,282	41,948	1.1	19,227	21,045	1.1				
Kabupaten Total	Average	34,134	184,894	5.4	13,141	38,739	2.9	57,606	241,666	4.2	57,819	821,970	14.2	37,087	40,803	1.1	24,571	28,118	1.1				
	2001	41,754	225,245	5.4	16,024	47,272	3.0	67,947	254,510	3.7	70,448	1,015,289	14.4	37,348	43,168	1.2	30,218	33,565	1.1				
	2002	44,179	237,719	5.4	16,391	48,037	2.9	70,253	247,584	4.9	70,256	987,364	14.1	41,012	41,704	1.0	28,520	34,360	1.2				
	2003	33,214	179,922	5.4	12,356	36,344	2.9	73,030	287,689	3.9	72,021	1,078,740	15.0	39,776	43,714	1.1	20,827	22,285	1.1				
	Average	39,716	214,295	5.4	14,924	43,884	2.9	70,410	296,594	4.2	70,908	1,027,131	14.5	39,379	42,862	1.1	26,522	30,070	1.1				
Kab. Pacitan	2004	117	567	4.8	5,690	16,842	3.0	5,816	18,728	3.2	5,780	60,979	10.6	2,393	2,038	0.9	269	190	0.7				
	2004	741	3,093	4.2	4,045	10,792	2.7	4,532	8,719	1.9	4,846	51,949	10.7	3,828	3,409	0.9	1,273	1,018	0.8				
	2004	501	2,415	4.8	3,958	14,400	3.6	3,986	20,684	5.2	4,500	102,960	22.9	839	1,128	1.3	471	377	0.8				
	2004	1,666	8,414	5.1	354	1,110	3.1	3,616	13,608	3.8	1,746			277	275	1.0	857	702	0.8				
	2004	1,448	8,104	5.6	-	-	-	1,180	4,319	3.7	839	12,915	15.4	20	26	1.3	-	-	-				

2/: Total of Project kecamatan in Wonogiri Source: Kabupaten Agriculture Services Office, Wonogiri & Karanganyar Regency in Figures, 2004, BPS

Table 1.2.11 Balances of Productions & Requirements of Food Crops by Kecamatan in DAS Wonogiri in 2003

Kecamatan	Rice (Paddy + Upland Rice)			Maize			Soybeans			Groundnut			Cassava		
	Supply (t)	Requirement 3/ (t)	Surplus Minus (t)	Supply (t)	Requirement 3/ (t)	Surplus Minus (t)	Supply (t)	Requirement 3/ (t)	Surplus Minus (t)	Supply (t)	Requirement 3/ (t)	Surplus Minus (t)	Supply (t)	Requirement 3/ (t)	Surplus Minus (t)
1. Pracimantoro	6,551	7,546	-995	11,071	1,094	9,977	1,686	703	983	1,060	223	837	19,365	1,094	18,271
2. Giritoniro	4,777	2,791	1,986	4,184	405	3,779	615	260	355	669	82	587	9,772	405	9,367
3. Girwiryo	7,413	5,375	2,038	14,710	779	13,931	3,355	500	2,855	2,870	159	2,711	13,022	779	12,243
4. Batuwarno	4,096	2,407	1,689	6,308	349	5,959	803	224	579	259	71	188	15,169	349	14,820
5. Karangtengah	4,249	2,764	1,485	13,713	401	13,312	1,918	257	1,661	3,077	82	2,995	17,371	401	16,970
6. Tirtomojo	7,178	6,380	798	4,964	925	4,039	216	594	-378	2,043	188	1,855	23,681	925	22,756
7. Nguntoronadi	3,054	3,144	-90	1,951	456	1,495	16	293	-277	1,368	93	1,275	6,922	456	6,466
8. Batureino	5,662	5,816	-154	3,673	843	2,830	1,345	541	804	468	172	296	3,068	843	2,225
9. Eromoko	5,528	5,569	-41	14,112	807	13,305	1,385	519	866	2,207	164	2,043	20,652	807	19,845
10. Wuryantoro	4,475	3,551	924	5,251	515	4,736	2,186	331	1,855	509	105	404	9,610	515	9,095
11. Maryaran	4,270	4,726	-456	3,511	685	2,826	3,413	440	2,973	2,105	139	1,966	11,419	685	10,734
12. Selogiri	8,895	6,073	2,822	461	880	-419	0	565	-565	242	179	63	2,904	880	2,024
13. Wonogiri	4,155	9,670	-5,515	4,750	1,402	3,348	59	900	-841	3,438	285	3,153	13,816	1,402	12,414
14. Ngadirojo	2,125	6,648	-4,523	9,917	964	8,953	0	619	-619	6,652	196	6,456	16,141	964	15,177
15. Sidoharjo	6,021	5,330	691	5,587	772	4,815	134	496	-362	2,634	157	2,477	7,711	772	6,939
16. Jatiroto	1,746	4,832	-3,086	21,364	700	20,664	30	450	-420	2,160	143	2,017	10,270	700	9,570
17. Slogohimo	7,650	5,996	1,654	11,049	869	10,180	0	558	-558	1,282	177	1,105	8,997	869	8,128
18. Jatsrono	5,480	7,539	-2,059	6,609	1,093	5,516	0	702	-702	784	222	562	9,932	1,093	8,839
19. Jatipurno	5,498	4,507	991	1,569	653	916	99	420	-321	127	133	-6	5,043	653	4,390
20. Girimarto	9,394	5,463	3,931	2,960	792	2,168	30	509	-479	2,420	161	2,259	9,559	792	8,767
Sub-total (in DAS)	108,217	106,127	2,090	147,714	15,384	132,330	17,290	9,881	7,409	36,374	3,131	33,243	234,424	15,384	219,040
Kabupaten Total	126,988	125,966	1,022	185,212	18,256	166,956	18,297	11,728	6,569	37,521	3,718	33,803	295,359	18,250	277,109

1/: Wonogiri kecamatanans located in DAS Wonogiri (Project kecamatanans)

2/: Annual food balances estimated by applying equation of: Balance = production - (post-harvest losses + seed requirements + average per capita consumption x population)

3/: Annual consumption per capita x population; rice 114 kg/capita; maize 16.5 kg/capita; soybeans 10.6 kg/capita; groundnut 3.4 kg/capita; cassava 16.5 kg/capita

Source: Kabupaten Agriculture Crops Services Office, Wonogiri

Table 1.2.13 Livestock Population and Average Holding Size per Farm by Project Kecamatan in DAS Wonogiri in 2003

Kabupaten/Kecamatan	Total Household 2003	% of Farm Household in 1983 2/	% of Farm Household in 1993 3/	Estimated No. of Farm Household in 2003 4/	Population of Animals & Fowls															
					Cow/Cattle		Buffalo		Sheep		Goat		Chicken (sayer)		Chicken (Ras)		Duck		Fowls Total	
					1983	2003	1983	2003	1983	2003	1983	2003	1983	2003	1983	2003	1983	2003	1983	2003
Kab. Wonogiri	15,750	12,588	88	13,860	4,877	5,293	275	11,930	2,245	11,930	52,165	72,700	-	15,000	1,020	2,710	53,185	90,410		
1. Pracinantoro	6,015	10,278	94	5,654	3,696	12,109	36	20,624	3,720	20,624	56,648	46,400	800	6,000	-	-	57,448	52,400		
2. Girintono	10,503	10,162	93	9,768	4,784	6,493	250	12,888	1,870	12,888	30,704	58,800	500	5,500	62	1,425	31,266	65,725		
3. Girwiryo	4,806	9,096	97	4,662	3,636	7,423	125	8,998	5,290	8,998	29,290	53,750	180	6,500	1,064	1,550	30,534	61,800		
4. Batuwarno	4,693		97	4,552	5,463	1,6			93	6,520	-	88,700	-	-	-	-	-	88,700		
5. Karangengah 5/	12,487	8,884	79	9,865	3,259	16,199	416	14,518	13,725	14,518	54,986	81,200	500	3,000	366	2,840	55,852	87,040		
6. Tirtonoyo	6,308	4,700	85	5,362	3,822	7,393	442	6,155	1,450	6,155	18,400	29,635	510	-	289	-	30,434	72,250		
7. Nguntoronadi	11,351	7,297	66	7,492	3,700	4,073	797	17,882	1,460	17,882	21,050	61,324	800	30,500	4,027	2,025	66,151	89,075		
8. Baturcino	11,050	9,393	82	9,061	4,673	6,268	371	11,845	1,445	11,845	21,600	52,739	337	25,000	1,003	6,500	54,079	144,150		
9. Eromoko	8,344	6,044	96	8,010	3,650	6,413	324	14,720	1,740	14,720	22,875	36,212	37,200	-	7,900	233	2,710	36,445	47,810	
10. Wuryantoro	9,266	7,068	90	8,339	4,884	4,213	434	5,260	3,965	5,260	15,985	26,870	104,050	464	-	-	335	1,725	27,669	
11. Manyaran	9,931	5,477	60	5,959	6,495	5,113	431	3,309	2,420	3,309	14,400	92,949	127,931	2,350	16,600	2,185	1,825	97,484	146,356	
12. Selogiri	19,324	8,292	46	8,889	3,311	3,518	111	12,004	2,380	12,004	10,700	57,896	141,200	3,664	3,480	394	1,625	61,954	146,305	
13. Wonogiri	12,621	9,808	81	10,223	4,879	6,293	257	8,469	5,420	8,469	25,825	62,620	154,900	-	55,500	325	1,650	62,945	212,050	
14. Ngadirojo	9,156	5,139	76	6,959	2,209	6,343	624	5,670	3,945	5,670	19,225	46,021	62,500	300	4,000	378	5,410	46,699	71,910	
15. Sidoharjo	8,638	7,808	83	7,170	1,898	5,883	290	11,909	3,220	11,909	17,050	35,564	56,550	-	3,500	112	1,330	35,676	61,380	
16. Jatiroto	11,106	10,987	89	9,884	2,850	4,603	321	18,476	5,621	18,476	24,100	32,995	66,200	150	-	428	1,530	33,573	67,730	
17. Slogohimo	13,783	9,863	80	11,026	2,422	3,373	87	6,937	4,015	6,937	17,500	50,000	50,400	-	4,000	-	1,755	50,000	56,155	
18. Jatisono	8,228	8,071	95	7,817	1,044	2,443	419	5,381	6,945	5,381	26,305	22,590	81,850	-	-	1,324	1,750	23,914	83,600	
19. Jatipurno	13,475	8,376	85	11,454	1,825	2,243	417	6,843	3,393	6,843	16,320	35,202	58,550	-	3,500	860	3,075	36,062	65,125	
20. Girimarto	206,835	159,331	81	166,006	67,914	121,152	6,427	203,518	80,789	203,518	362,930	866,410	1,384,331	10,555	189,980	14,405	41,435	891,370	1,815,746	
Sub-total (in DAS)	37,551	27,073	-	34,391	12,328	22,010	234	56,765	18,525	56,765	94,665	172,562	236,444	635	2,000	2,070	8,410	2,070	8,410	
Other 5 Kecamatan	244,386	186,404	82	200,397	80,242	143,162	6,661	260,281	99,314	260,281	437,595	1,038,972	1,820,775	11,190	191,980	16,475	49,845	893,440	1,824,156	
Kabupaten Total	204			204				204		204		204		204				204		
Kab. Pacitan	10,514	4,131		5,373	3,360			104,252		104,252				2004		2004		2004		
1. Donorio	10,066	4,840		4,840	1,785			85,046		85,046				3,900		818		3,900		
2. Punning	8,868	4,264		4,264	664			96,468		96,468				11,000		1,074		11,000		
3. Pringkuku	15,462	4,432		4,432	4,254			103,455		103,455				686		686		686		
4. Nawangan	8,192			8,192	661			72,612		72,612				395		436		395		
Kab. Karanganyar																				
1. Jatiyoso																				

1/ Wonogiri kecamatan located in DAS Wonogiri (Project kecamatan) 2/ Sensus Pertanian 1993 3/ Proportion (%) of farm household to total household indicated in Sensus Pertanian 1993, BPS Wonogiri 4/ Estimated no. of farm household = total households x % of farm household in 1993 5/ Karangengah was separated from Batuwarno in 2002; figures for Karangengah for 1983 was included in Batuwarno Source: Wonogiri in Figures 2003, 1983 & 1993, BPS, Kab. Wonogiri; Pacitan & Karanganyar Regency in Figures 2004, BPS Kab. Pacitan

Table 1.2.18 Related Support Programs Implemented by Wonogiri Agriculture Services Office in 2003

Sub-services/Programs	Program Description	Program Amount (Rp. Million)	Target Area/Group	Financial Source 1/												
1. Food Crops Sub-services																
Program: Food Crops Productivity Increase																
- Strengthening of Beneficiary Farmer Groups of BLM	- Empowerment of farmer groups & provision of credit	511	25 kecamatans 168 farmer groups 840 ha	APBD												
- Paddy Intensification Quality Improvement (PMI)	- Provision of farm inputs to farmers	500	3 kecamatans 16 farmer groups	APBN												
- Small Scale Farmers Income Generation (P4K)	- Provision of credit to small scale	291	22 kecamatans 687 farmer groups	APBN APBD IFAD												
2. Estate Crops Sub-services																
Program: Estate Crops Productivity Increase																
- Estate Crops Development	- Provision of seedlings to farmers	107	<table border="0"> <thead> <tr> <th>Crop</th> <th>Area</th> </tr> </thead> <tbody> <tr> <td>Coconut</td> <td>45 ha</td> </tr> <tr> <td>Janggolan</td> <td>2.7 ha</td> </tr> <tr> <td>Cashew nut</td> <td>72 ha</td> </tr> <tr> <td>Vanilla</td> <td>4 ha</td> </tr> <tr> <td>Pepper</td> <td>8 ha</td> </tr> </tbody> </table>	Crop	Area	Coconut	45 ha	Janggolan	2.7 ha	Cashew nut	72 ha	Vanilla	4 ha	Pepper	8 ha	APBD
Crop	Area															
Coconut	45 ha															
Janggolan	2.7 ha															
Cashew nut	72 ha															
Vanilla	4 ha															
Pepper	8 ha															
KIMBUN Cashew Nut	- Provision of credit to small scale farmer	500	8 kecamatans 15 farmer groups 50 ha	APBN												
Development of Medical Crops Agri-business	- Provision of credit to farmers	250	10 kecamatans 100 ha	APBN												
Development of Sugarcane in Central Java	- Provision of seedlings to farmers	197	133 ha	APBN												
3. BIMAS Food Security Sub-services																
Program: Development of Agribusiness & Food Security																
- Horticulture Crops Development	- Provision of seedlings to farmers	127	<table border="0"> <thead> <tr> <th>Crop</th> <th>No. plants</th> </tr> </thead> <tbody> <tr> <td>Citrus</td> <td>5,500</td> </tr> <tr> <td>Salak</td> <td>2,700</td> </tr> <tr> <td>Durian</td> <td>6,000</td> </tr> <tr> <td>Rambutan</td> <td>2,500</td> </tr> <tr> <td></td> <td>59 ha</td> </tr> </tbody> </table>	Crop	No. plants	Citrus	5,500	Salak	2,700	Durian	6,000	Rambutan	2,500		59 ha	APBD
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	48 ha															
- Development of Food Crops Prog. Pawonsari	- Provision of mango seedlings to farmers	37	Mango 6,000	APBD												
- Grape Development	- Provision of grape seedlings & farm inputs to farmers	11	Grape 1,000 0.5 ha	APBD												

1/: APBN --- national budget; APBD --- kabupaten budget

Source: Kabupaten Agriculture Services Office, Wonogiri

Table 1.2.21 Inventory on Agriculture Support Institutions by Kecamatan in DAS Wonogiri in 2004 (1/2)

Kecamatan	Former BPP	Extension Staffs (in number)										Food Crops Research Institute 3/	Plant Protection		Seed & Nursery Production & Supply		P4S	RMU 4/	
		Sub-sector Coordinator		No. of Crop Extension Staffs 2/		No. of Livestock & Fishery Sub-sector Extension Staffs		Livestock Inseminator		Fishery			BPTPH	PHP	BBI	BBP			BFSB
				PPLs 2/	Total	Livestock	Inseminator	Fishery	Total										
1. Pracimantoro	1	1	3	4	1	2	3					1					15		
2. Girifontro	1	1	3	4	1	1	2					1					5		
3. Giriwiryo	1	1	4	5	1	2	3										14		
4. Batuwarno	1	1	2	3	1	1	2										11		
5. Karangtengah	1	1	2	3	1	1	2										9		
6. Tirtomoyo	1	1	2	3	1	1	2										36		
7. Nguntoronadi	1	1	4	5	1	1	2										17		
8. Baturetno	1	1	3	4	1	2	3										32		
9. Eronoko	1	1	4	5	1	1	2										18		
10. Wuryantoro	1	1	4	5	1	1	2										8		
11. Manyaran	1	1	4	5	1	1	2										20		
12. Selogiri	1	1	7	8	1	1	2										35		
13. Wonogiri	1	1	4	5	1	1	2										20		
14. Ngadirojo	1	1	5	6	1	1	2										22		
15. Sidoharjo	1	1	3	4	1	2	3										19		
16. Jatiroto	1	1	3	4	1	1	2										16		
17. Slogohimo	1	1	4	5	1	1	2										24		
18. Jatisrono	1	1	3	4	1	1	2										34		
19. Jatipurno	1	1	4	5	1	1	2										26		
20. Girimarto	1	1	4	5	1	1	2										37		
Sub-total (in DAS)	20	20	71	91	18	14	46										418		
Other 5 Kecamatan	5	5	10	15	6	4	12										64		
Kabupaten Total	25	25	96	121	24	18	58										482		
Central Java Province																			

1/: Wonogiri kecamatan located in DAS Wonogiri (Project kecamatan) 2/: Include 15 PPLs & 5 Coordinators & deployed in Kabupaten Agriculture Services Office

3/: BPTP Terpadu (Integrated Agricultural Technology Assessment Center) , Ungaran, Kab. Semarang (central government institution) 4/: RMU --- Rice Mill Unit

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

Table 1.2.21 Inventory on Agriculture Support Institutions by Kecamatan in DAS Wonogiri in 2004 (2/2)

Kecamatan	Farm Input Supply				KUD			Credit Institutions 5/			Market		Processing Facilities (other than rice mill)	
	SHS	PT Pertani	PT Pusri	Inputs Kios	No.	Members	Trade Amount (Rp. Million)	BRI	Other Banks		General	Village		Animal
									BKK	BPR				
1. Pracimantoro				7	1	6,351	400.0	1	1	1	1	1	1	
2. Girifontoro				2	1	3,337	31.3	1	1	1	1	2	1	
3. Giriwiryo				3	1	3,439	597.6	1	1	1	1	1	1	
4. Batuwarno				2	1	1,673	1,087.8	1	1	1	1	2	1	
5. Karangtengah				17	1	1,655	103.8	1	1	0	0	3	3	
6. Tirtonoyo				7	1	3,595	2,168.0	1	1	1	1	5	1	
7. Nguntoronadi				20	1	1,736	287.6	1	1	1	1	3	1	
8. Baturetno				10	1	6,500	271.5	1	1	1	1	1	1	
9. Eromoko				18	1	1,787	763.9	1	1	1	1	1	1	
10. Wuryantoro				11	1	2,838	966.6	1	1	1	1	2	1	
11. Manyaran				11	1	1,948	87.1	1	1	1	1	2	1	
12. Selogiri				5	1	3,761	549.4	2	1	1	1	2	1	
13. Wonogiri distributor				15	1	3,045	755.6	4	1	2	3	3	cashew nut 2	
14. Ngadirojo				11	1	8,776	349.4	2	1	1	1	3	1	
15. Sidoharjo				4	1	8,030	2,198.0	1	1	1	1	4	1	
16. Jatiroto				12	1	5,576	914.2	1	1	1	1	3	1	
17. Slogohirno				27	1	8,916	995.6	1	1	1	1	4	1	
18. Jatisrono				6	1	4,440	348.1	2	1	1	1	3	1	
19. Jatipurno				11	1	5,821	712.3	1	1	1	1	3	1	
20. Girimarto				9	1	9,178	847.1	2	1	1	1	4	1	
Sub-total (in DAS)	-	1	-	208	20	92,402	14,435	26	17	5	21	51	6	
Other 5 Kecamatan	-	-	-	81	4	15,195	93,162	4	3	1	4	14	2	
Kabupaten Total	-	1	-	289	24	107,597	107,597	30	20	6	25	65	8	
Central Java Province	Kab. Klaten		Kab. Semarang											

1/: Wonogiri Kecamatan located in DAS Wonogiri (Project kecamatanans)

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

Source: Kabupaten Agriculture Services Office, Wonogiri

Table 1.3.2 Current Status of State Forest in DAS Wonogiri in 2004

BKPH	Branch or Field Offices of KPFI Surakarta	State Forest in 2003 (ha) 2/											Total	Remarks
		Sonokeling			Production Forest			Less Productive Forest			Protected Forest	Total		
		Merksi Pine	Other Trees 3/	Not Suitable	Not Planted	Others	Total	Produced	Forest	Forest				
Wonogiri	RPH	5	1,684	3,275	840	93	140	6,032	242	6,274		6,274		
Baturetino		5	1,540	4,300	645	100	219	6,804	15	6,819		6,819		
Luwu Selatan		3	330	include pine	2	51	383	383	860	4,594		4,594		
Purwanto		4	2,264	1,428	243	204	16	4,155	195	4,350		4,350		
Total %		17	2,594 (15%)	9,003 (52%)	1,730 (10%)	448 (3%)	375 (2%)	17,374 (79%)	1,312 (6%)	22,037 (100%)		22,037	100%	

1/: Some kecamatan are covered by plural KPHs since KPH boundaries not consistent with kecamatan boundaries

2/: Include merksi pine when no figure shown in column merksi pine or include sonokeling when no figure shown in column sonokeling

Table 1.3.4 Annual Actual & Planned Reforested Areas in State Forest in DAS Wonogiri from 2000 to 2007

BKPH	Reforested Area (ha)							Total	Major Species	Remarks
	2000	2001	2002	2003	2004	2005	2006			
Wonogiri	38	101	165	252	113	373	66	192	1,300	Mahogany, Teakwood
Baturetino	275	234	117	273	230	133	68	186	1,516	Teakwood, mahogany, pine
Luwu Selatan	152	43	123	10	148	68	45	35	624	Pine, <i>Acacia deglenu</i>
Purwanto	124	171	191	171	239	120	132	19	1,167	Teak woods, mahogany, pine
Total (ha)	589	549	596	706	730	694	311	432	4,607	

1/: 2000 to 2004: actual reforested areas; 2005 to 2007: planned reforested areas

Table 1.3.10 Tree & Tree Crops Nurseries in DAS Wonogiri

Institution	Location	Area (ha)	Major Species	Annual Seedling Production (No. of seedlings)	Remarks
1. State Forest Company BPKH Luwu Selatan	Kec. Jatipuro	0.95	- Merksi pine	754,000 (in 2005) Capacity: 800,000 ~ 1,000,000	- Producing seedling needed in Wonogiri
2. Horticulture Seed Farm	Kec. Wonogiri	2.50	- Mango	Mango: 300 seedling/year (grafted seedling)	- Poorly operated & production limited - Only 2 staffs
3. Farmer Groups KT at Kerjolor KT at Pondok KT Konco Tani KT Manunggal	Desa Kerjolor, Kec. Ngadirojo Desa Pondok, Kec. Ngadirojo Desa Sambirejo, Kec. Jatitrono Desa Soco, Kec. Sologohimo	- - - -	- Teakwood, mahogany, fruit trees - Teakwood, sengong, mahogany, pete, fruit trees - Teakwood, clove, mahogany, fruit trees - Teakwood	n.a. n.a. n.a. n.a.	Partnership arrangement with CV Lulus Tani & supply seedlings to the firm
4. Private Firm CV Lulus Tani CV Kencana Wilis	Kec. Ngadirojo Activity at Kec. Ngadirojo	- -	- Teakwood, mahogany, pete, fruit trees, estate crop - Partnership arrangement with KT at Ngadirojo	- 3,500,000 in 2004 (rough estimate of CV)	- Seedling supplier for GERHAN 2004 - Partnership arrangement with KT - Seedling supplier for GERHAN 2004 - Office at Kab. Karangayar

Source: Perum Perhutani, KPH Surakarta; LKHP & JICA Phase II Study

Table 1.3.6 Annual Budget Expended & Allocated for BP DAS Solo

In 2004 (actual expenditures)		In 2005 (budget)			
Items	Amount (Rp. Million)	Budget Source	Items	Amount (Rp. Million)	Amount (%)
1. Administration Cost (Rehabilitasi Hutan & Tanah Kritis)	1,683	DIK	1. General Administration Cost	2,276	56.0
2. Strengthening Activities for Preventing & Recovering Forest, Land & Water Resources Damages in BP DAS Solo	121	DIK-S	2. Formulation of Programming & Planning for Works, Technologies & Program	425	10.5
3. Project for planning & Evaluation on Management of DAS Solo	753	DIP(APBN)	3. Construction of SPAS in Micro Model in DAS in Das Solo & Grindulu	328	8.1
4. Peoples Forest Development & Management Project in DAS Solo	973	DIP(APBN)	4. Construction of Sediment Prevention Structures	58	1.4
5. Forest & Land Rehabilitation & Management in DAS Solo	2,095	DIK-S DR	5. Watershed Rehabilitation	398	9.8
6. Seedling Production for GERHAN	44,146	SKO-R	6. DAS & Coastal Management	353	8.7
			7. Technical Training & Education	66	1.6
			8. Institutional Development	162	4.0
Total	49,771		Total	4,066	100

Source: BP DAS Solo

Table 1.3.7 Related Support Programs Implemented by Wonogiri Agriculture Services Office in 2003

Sub-services/Programs	Program Description	Program Amount (Rp. Million)	Target Area/Group	Financial Source 1/												
1. Food Crops Sub-services																
Program: Food Crops Productivity Increase																
- Strengthening of Beneficiary Farmer Groups of BLM	- Empowerment of farmer groups & provision of credit	511	25 kecamatans 168 farmer groups 840 ha	APBD												
- Paddy Intensification Quality Improvement (PMI)	- Provision of farm inputs to farmers	500	3 kecamatans 16 farmer groups	APBN												
- Small Scale Farmers Income Generation (P4K)	- Provision of credit to small scale	291	22 kecamatans 687 farmer groups	APBN APBD IFAD												
2. Estate Crops Sub-services																
Program: Estate Crops Productivity Increase																
- Estate Crops Development	- Provision of seedlings to farmers	107	<table border="0"> <thead> <tr> <th><i>Crop</i></th> <th><i>Area</i></th> </tr> </thead> <tbody> <tr> <td>Coconut</td> <td>45 ha</td> </tr> <tr> <td>Janggolan</td> <td>2.7 ha</td> </tr> <tr> <td>Cashew nut</td> <td>72 ha</td> </tr> <tr> <td>Vanilla</td> <td>4 ha</td> </tr> <tr> <td>Pepper</td> <td>8 ha</td> </tr> </tbody> </table>	<i>Crop</i>	<i>Area</i>	Coconut	45 ha	Janggolan	2.7 ha	Cashew nut	72 ha	Vanilla	4 ha	Pepper	8 ha	APBD
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Coconut	45 ha															
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Vanilla	4 ha															
Pepper	8 ha															
KIMBUN Cashew Nut	- Provision of credit to small scale farmer	500	8 kecamatans 15 farmer groups 50 ha	APBN												
Development of Medical Crops Agri-business	- Provision of credit to farmers	250	10 kecamatans 100 ha	APBN												
Development of Sugarcane in Central Java	- Provision of seedlings to farmers	197	133 ha	APBN												
3. BIMAS Food Security Sub-services																
Program: Development of Agribusiness & Food Security																
- Horticulture Crops Development	- Provision of seedlings to farmers	127	<table border="0"> <thead> <tr> <th><i>Crop</i></th> <th><i>No. plants</i></th> </tr> </thead> <tbody> <tr> <td>Citrus</td> <td>5,500</td> </tr> <tr> <td>Salak</td> <td>2,700</td> </tr> <tr> <td>Durian</td> <td>6,000</td> </tr> <tr> <td>Rambutan</td> <td>2,500</td> </tr> <tr> <td></td> <td>59 ha</td> </tr> </tbody> </table>	<i>Crop</i>	<i>No. plants</i>	Citrus	5,500	Salak	2,700	Durian	6,000	Rambutan	2,500		59 ha	APBD
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- Development of Food Crops Prog. Pawonsari	- Provision of mango seedlings to farmers	37	Mango 6,000	APBD												
- Grape Development	- Provision of grape seedlings & farm inputs to farmers	11	Grape 1,000 0.5 ha	APBD												

1/: APBN --- national budget; APBD --- kabupaten budget

Source: Kabupaten Agriculture Services Office, Wonogiri

Table 1.3.11 State Forest, Peoples Forest and Forestry Support Institutions in DAS Wonogiri in 2004

Kecamatan	Branch or Field Offices of KPH Surakarta		BKPH	State Forest in 2003 (ha) 2/										Model Village PHBM (as of Nov. 2004)			
	BKPH	RPH		Production Forest							Less Productive Forest	Protected Forest	Total	Area (ha)	No. of Villages		
				Merksi Pine	Sonokeling	Other Trees 3/	Not Suitable	Not Planted	Others	Total							
1. Nguntoronadi			Wonogiri														
2. Selogiri																	
3. Wonogiri	1	2			1,684	3,275	840	93	140	6,032	242		6,274	796	6		
4. Tirtomoyo		1															
5. Manyaran																	
6. Ngadirojo																	
8. Sidoharjo			Luwu Selatan														
9. Pracimantoro																	
10. Giritontro		1															
11. Giriwiry		1															
12. Batuwarno		1			1,540	4,300	645	100	219	6,804	15		6,819	2,222	5		
13. Eromoko		1															
14. Wuryantoro			Purwanto														
15. Baturetno	1	1															
16. Karangtengah		2															
17. Jatisrono	1	1															
18. Jatipurno		1			330		2	51		383	860	3,351	4,594	1,325	2		
19. Girimarto																	
20. Jatiroto		1	Total	2,264		1,428	243	204	16	4,155	195		4,350	2,134	8		
21. Slogohimo		2															
Sub-total (in DAS)	3	14	4 BKPH	2,594	3,224	9,003	1,730	448	375	17,374	1,312	3,351	22,037	6,477	21		
Other Kecamatan	1	3	%	15%	19%	52%	10%	3%	2%	100%	-	-	-	-	-		
Kabupaten Total	4	17	%	15%	19%	52%	10%	3%	2%	100%	6%	15%	100%				

2/: Some kecamatan are covered by plural KPHs since KPH boundaries not consistent with kecamatan boundaries

3/: Include merksi pine when no figure shown in column merksi pine or include sonokeling when no figure shown in column sonokeling

Kecamatan	State Forest 2003 (ha) 4/	Peoples Forest 2004 (ha) 5/	Peoples Forest & Support Institutions										Training Center & Research Institute 9/	
			Target Area of Peoples Forest Programs (ha) 6/			Field Extension Staffs 7/			KT Gerhan 8/		Active KBD (Village Nurseries)			
			Past	2003	2004	Total	Coordinate	PKLs	Total	2003		2004		
1. Pracimantoro	359	3,083	100	475	400	875	1	1	2	9	11			
2. Giritontro	25	2,151	125	137	200	337	1		1	2	6			
3. Giriwiry	200	1,182	125	175	375	550	1	1	2	5	12			
4. Batuwarno	318	1,163	50	150	275	425	1	1	2	3	7			
5. Karangtengah	1,438	1,105	0	150	800	950	1		1	4	5			
6. Tirtomoyo	1,572	384	25	250	400	650	1	1	2	5	11			
7. Nguntoronadi	594	343	0	200	225	425		1	1	4	7			
8. Baturetno	308	326	100	150	175	325	1	1	2	4	6			
9. Eromoko	1,303	1,083	100	450	200	650	1	1	2	7	6			
10. Wuryantoro		709	50	150	50	200	1		1	3	2			
11. Manyaran	200	230	100	200	200	400	1	1	2	4	7			
12. Selogiri	864	121	25	25	100	125	1		1	1	3			
13. Wonogiri	1,680	117	25	75	75	150	1	2	3	1	3		training center 1	
14. Ngadirojo	250	165	25	50	75	125	1	1	2	2	2		2	
15. Sidoharjo	741	175	25	300	250	550	1	1	2	7	7			
16. Jatiroto	1,315	225	25	150	400	550	1	1	2	3	8			
17. Slogohimo		312	25	200	175	375	1	2	3	2	7		1	
18. Jatisrono		153	0	100	75	175	1	1	2	2	4		1	
19. Jatipurno	1,211	748	0	300	100	400	1	1	2	3	4			
20. Girimarto	557	160	25	300	400	700	1	2	3	6	10		1	
Sub-total (in DAS)	12,935	13,935	950	3,987	4,950	8,937	19	19	38	77	128	5		
Other Kecamatan	3,355	2,918	150	1,044	700	1,744	5	3	8	13	14	0		
Kabupaten Total	16,290	16,853	1,100	5,031	5,650	10,681	29	22	51	90	142	5		
C. Java Province														BP2TP, Surakarta

1/: Wonogiri kecamatan located in DAS Wonogiri (Project kecamatan) 4/: Wonogiri in Figures, 2003, BPS Wonogiri

5/: Forestry Sub-services, LHKT Wonogiri

6/: Past: areas covered by peoples forest program from 1999/00 to 2002; Gerhan: total areas covered by Gerhan Peoples Forest Program in 2003(implemented) & 2004(planned)

7/: Include 5 coordinators assigned in Kabupaten office 8/: KT Gerhan: Gerhan Farmer Groups for Peoples Forest Program

9/: Watershed Management Information Center Ir. M.H. Soedarna, PB DAS Solo in Wonogiri & BP2TP in Surakarta

Source: Perum Perhutani, KPH Surakarta & LHKT Wonogiri

Table 2.1.1 Lessons Learned form Past Experiences in Watershed Conservation Projects in DAS Wonogiri

<p><u>1. Technical Issues</u></p> <ul style="list-style-type: none"> - Well integrated & coordinated physical and vegetative or civil and agricultural measures are essential. - Combined package 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. - Introduction of measures which are accepted & practiced by farmers/farmers groups and sustainable; not sophisticated, low cost, use of available materials. - Agro-forestry approaches: Past projects were too much forestry oriented; to employ integrated forestry & agronomic approaches. - Not blue print approaches, but area specific & flexible prescriptions by watershed conditions are prerequisite. - High priority to be given to sub-watersheds which are main contributors to the acute sedimentation problems in the Wonogiri Reservoir. - Land is often left by the family head working on a seasonal basis in the cities. Recommended agricultural measures are to be in line with this reality. - Crop Selection & Cropping Pattern <ul style="list-style-type: none"> - Need of crops tolerant to dry climate & with adequate economic value - Introduction of area specific superior crops/commodity andalan for dry land - Further adaptation of multiple cropping system with legumes should be aimed for improvement of cropping - Development of commodities suitable for conservation purposes is to be envisaged. - Selection of agricultural commodities should be based on market potential followed by technical & social value. - One alternative is to combine perennial crops with seasonal crops in home compound & dry farm land.
<p><u>2. Project Management Issues</u></p> <ul style="list-style-type: none"> - Project failed because of top-down management & use of inflexible prescriptions poorly adapted to local conditions. - Reasons not following integrated approaches; project expenditures are to be spread as much as possible among villages and communities in the project area. - Planning is to be based on prospects for sustainable income flow, farmers traditional customs of cultivation, off-farm income, availability of credits & markets, existing social priorities. - Grant aid in terrace rehabilitation has resulted in a detrimental change in social behavior in self reliant activities for soil conservation and terrace rehabilitation. - Depending solely on conservation measures would mean implementing remedial measures without tackling, preventing and solving the real causes. - Monitoring of performances of the programs implemented seldom practiced in the past. - Precondition for success: strong & motivated extension services involving PPL & PKL will form the key in implementing & sustaining conservation efforts. - Government support is still required & essential for supporting farming activities. The level of incentives should be sufficiently high to induce farmers participation in soil conservation programs. - Legal or official procedures will be necessary for controlling cropping pattern in dry farm land.
<p><u>3. Social & Institutional Issues</u></p> <ul style="list-style-type: none"> - Institutionalization of integrated & synergetic efforts & activities toward watershed management in the Wonogiri catchment area is to be envisaged. - Technical collaboration team & technical working team at kabupaten level and integrated institutions at kecamatan & village levels are to be established. - Multi-stakeholders dialog at district & watershed levels are to be maintained. - As farmers are becoming more interested in income earned in non-agricultural activities, they are increasingly reluctant to invest in their own farm especially when it concerns maintenance of their terraces and waterways. - To achieve a balance between the farmers aspiration & the project objectives, an integrated planning which involves the bottom-up and bottom-down approaches is needed. - Peoples behavior depends on their local culture. So, whatever programs must be formulated accordingly and not given as a uniform package for all locations, but must be arranged together with their leaders and then given to the people by various methods of extension and communications. Traditional values must be taken into account to ensure participation of communities.

1/: Lessons learned extracted based on the review on the following reports & interview with the agencies concerned

- Consulting Services for the Upper Solo (Wonogiri) Watershed Protection Project, Monitoring & Evaluation Final Report, July 1991, BCEOM
- Report on the Evaluation of Wonogiri Watershed Management, Watershed Management Technology Center (BP2TP DAS), Surakarta, 1995

Table 2.2.1 Annual Average Soil Loss based on Landuse Class

(unit : thousand ton)

Land Use	Slope (%)	Annual Average Soil Loss Criteria (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	2	153	0	0	156
	15 - 25	2	1	109	155	0	267
	25 - 40	1	4	7	383	11	405
	Above 40	0	6	6	144	712	868
Sub-Total		15	47	294	682	722	1,761
Upland Field	0 - 8	38	102	252	0	0	392
	8 - 15	3	4	515	133	0	656
	15 - 25	5	2	94	642	0	742
	25 - 40	1	9	13	672	72	768
	Above 40	0	11	9	410	804	1,235
Sub-Total		47	128	884	1,857	877	3,792
Sub-Total		62	175	1,178	2,539	1,599	5,554
Upland Field	0 - 8	35	72	62	0	0	169
	8 - 15	8	20	374	52	0	454
	15 - 25	19	7	423	575	1	1,025
	25 - 40	21	44	184	1,772	156	2,177
	Above 40	5	148	117	2,897	2,128	5,295
Sub-Total		88	292	1,160	5,295	2,285	9,120
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
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							
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	2	4	0	0	8
	8 - 15	2	3	20	5	0	30
	15 - 25	6	2	37	52	1	98
	25 - 40	9	22	68	169	19	286
	Above 40	24	90	159	506	251	1,031
Sub-Total		42	120	288	732	270	1,454
Sub-Total		44	122	302	732	270	1,470
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		254	665	3,190	9,012	4,159	17,279

Table 2.2.2 Area of Landuse

(unit : ha)

Land Use	Slope (%)	Annual Average Soil Loss Criteria (t/ha/year)					Total
		0 - 20	20 - 50	50 - 250	250 - 1,000	Above 1,000	
Paddy Field	0 - 8	14,498	0	0	0	0	14,498
	8 - 15	4,921	0	0	0	0	4,921
	15 - 25	3,717	0	0	0	0	3,717
	25 - 40	2,865	0	0	0	0	2,865
	Above 40	4,492	0	0	0	0	4,492
Sub-Total		30,494	0	0	0	0	30,494
Home Settlement Area							
Housing Yard and Garden	0 - 8	1,148	999	332	0	0	2,480
	8 - 15	137	64	1,419	0	0	1,620
	15 - 25	176	19	580	484	0	1,259
	25 - 40	47	156	46	674	10	933
	Above 40	2	138	76	179	601	997
Sub-Total		1,511	1,377	2,453	1,337	610	7,289
Upland Field	0 - 8	3,291	3,083	3,152	0	0	9,526
	8 - 15	409	113	3,168	461	0	4,152
	15 - 25	375	60	514	1,711	0	2,660
	25 - 40	59	324	86	1,086	62	1,617
	Above 40	2	265	108	474	671	1,520
Sub-Total		4,137	3,845	7,028	3,732	733	19,475
Sub-Total		5,648	5,222	9,481	5,069	1,343	26,764
Upland Field	0 - 8	4,569	2,217	868	0	0	7,654
	8 - 15	1,378	532	3,345	169	0	5,423
	15 - 25	1,911	251	2,725	1,545	1	6,432
	25 - 40	1,481	1,507	1,074	3,520	134	7,716
	Above 40	379	4,352	1,388	4,743	1,670	12,532
Sub-Total		9,717	8,859	9,400	9,977	1,804	39,757
Orchard/Plantation	0 - 8	2,599	421	0	0	0	3,019
	8 - 15	467	961	540	0	0	1,968
	15 - 25	525	309	1,443	0	0	2,277
	25 - 40	578	316	1,451	89	0	2,434
	Above 40	850	21	928	1,368	0	3,167
Sub-Total		5,019	2,028	4,362	1,458	0	12,866
Forest	0 - 8	28	0	0	0	0	28
	8 - 15	35	0	0	0	0	35
	15 - 25	11	38	0	0	0	49
	25 - 40	19	6	35	0	0	60
	Above 40	43	0	67	0	0	109
Sub-Total		135	44	101	0	0	281
State Forest							
Forest	0 - 8	22	0	0	0	0	22
	8 - 15	27	0	0	0	0	28
	15 - 25	26	27	0	0	0	52
	25 - 40	35	12	36	0	0	83
	Above 40	103	0	98	0	0	200
Sub-Total		212	39	133	0	0	385
Other Land Use	0 - 8	366	75	48	0	0	489
	8 - 15	349	93	166	16	0	624
	15 - 25	754	89	304	136	0	1,283
	25 - 40	930	720	448	332	16	2,445
	Above 40	2,024	2,580	1,739	1,005	205	7,554
Sub-Total		4,423	3,557	2,705	1,489	220	12,394
Sub-Total		4,635	3,596	2,838	1,489	220	12,779
Others	0 - 8	419	10	4	0	0	433
	8 - 15	141	20	0	0	0	162
	15 - 25	128	30	15	0	1	174
	25 - 40	137	54	42	0	0	234
	Above 40	259	33	79	9	1	381
Sub-Total		1,084	148	140	9	2	1,384
Grand-Total		56,732	19,897	26,323	18,002	3,371	124,325

Table 2.2.3 Annual Average Soil Loss/ha based on Landuse Class

(unit : ton per hectare)

Land Use	Slope (%)	Annual Average Soil Loss Criteria (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	23.94	0.00	0.00	0.00	0.37
	15 - 25	0.68	0.00	0.00	0.00	0.00	0.68
	25 - 40	1.21	0.00	93.80	0.00	0.00	1.21
	Above 40	2.03	0.00	0.00	0.00	0.00	2.03
Sub-Total		0.59	23.94	93.80	0.00	0.00	0.59
Home Settlement Area							
Housing Yard and Garden	0 - 8	10.22	33.59	58.46	0.00	0.00	26.09
	8 - 15	5.88	33.07	107.71	257.38	0.00	96.18
	15 - 25	11.50	37.04	188.60	320.75	0.00	212.42
	25 - 40	16.29	28.51	148.76	567.66	1084.78	434.26
	Above 40	12.19	43.48	76.90	806.19	1185.02	870.75
Sub-Total		10.17	34.03	120.00	510.05	1183.42	241.60
Upland Field	0 - 8	11.46	33.15	80.10	0.00	0.00	41.19
	8 - 15	7.01	38.05	162.71	288.44	0.00	157.94
	15 - 25	13.13	25.36	182.89	375.06	1011.95	279.06
	25 - 40	16.49	29.11	149.54	618.84	1163.36	474.62
	Above 40	12.47	41.09	85.94	865.73	1199.18	812.14
Sub-Total		11.24	33.38	125.78	497.56	1196.11	194.74
Sub-Total		10.95	33.55	124.29	500.85	1190.34	207.50
Upland Field	0 - 8	7.77	32.43	70.97	0.00	0.00	22.08
	8 - 15	5.79	38.14	111.93	306.33	0.00	83.77
	15 - 25	10.01	28.34	155.09	372.37	1083.00	159.32
	25 - 40	13.96	29.25	171.64	503.31	1164.59	282.13
	Above 40	13.63	34.10	84.00	610.68	1274.44	422.50
Sub-Total		9.10	32.93	123.36	530.75	1266.21	229.38
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
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							
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	17.93
	25 - 40	2.64	43.38	67.29	0.00	0.00	36.72
	Above 40	5.02	0.00	116.45	0.00	0.00	59.37
Sub-Total		4.98	34.18	103.28	0.00	0.00	42.07
Other Land Use	0 - 8	4.80	30.50	81.77	0.00	0.00	16.27
	8 - 15	4.76	35.93	122.01	305.68	0.00	48.51
	15 - 25	8.01	27.95	121.82	382.48	1671.74	76.49
	25 - 40	9.45	30.43	151.18	508.93	1193.95	116.89
	Above 40	11.97	35.04	91.47	503.83	1227.95	136.54
Sub-Total		9.60	33.86	106.46	491.71	1226.28	117.27
Sub-Total		9.39	33.86	106.31	491.71	1226.28	115.01
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		4.47	33.42	121.18	500.59	1233.83	138.98

Table 2.2.7 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
	8 - 15	1	0	0	0	0	0	0	0	2
	15 - 25	2	0	0	0	0	0	0	0	3
	25 - 40	2	1	0	0	0	0	0	0	3
	Above 40	7	1	0	1	0	0	0	0	9
Sub-Total		12	3	0	2	1	1	0	0	18
Home Settlement Area										
Housing Yard and Garden	0 - 8	40	6	4	5	4	2	3	0	65
	8 - 15	106	18	6	12	5	3	4	1	156
	15 - 25	152	56	9	33	7	4	4	3	267
	25 - 40	165	138	11	70	9	6	3	4	405
	Above 40	497	232	8	92	18	13	4	3	868
Sub-Total		961	450	39	211	42	27	18	12	1,761
Upland Field	0 - 8	154	44	28	49	63	22	27	6	392
	8 - 15	335	84	32	82	55	23	31	14	656
	15 - 25	354	128	32	125	41	24	21	17	742
	25 - 40	297	205	27	152	38	21	15	13	768
	Above 40	657	272	17	180	48	39	14	9	1,235
Sub-Total		1,797	732	136	588	245	128	108	58	3,792
Sub-Total		2,758	1,183	175	799	287	156	126	70	5,554
Upland Field	0 - 8	41	18	15	24	47	8	10	5	169
	8 - 15	116	78	39	83	62	23	33	22	454
	15 - 25	194	247	71	277	82	59	43	51	1,025
	25 - 40	313	668	158	691	127	106	41	73	2,177
	Above 40	1,062	1,900	376	1,329	203	243	70	113	5,295
Sub-Total		1,726	2,911	660	2,403	521	438	197	264	9,120
Orchard/Plantation	0 - 8	13	4	3	3	1	1	2	1	28
	8 - 15	34	10	6	10	3	1	5	4	73
	15 - 25	51	29	9	31	5	4	8	9	144
	25 - 40	61	65	13	82	9	7	9	9	255
	Above 40	204	128	22	172	13	12	11	8	570
Sub-Total		363	235	52	298	31	25	35	31	1,071
Forest	0 - 8	0	0	0	0	0	0	0	0	0
	8 - 15	0	0	0	0	0	0	0	0	0
	15 - 25	1	0	0	0	0	0	0	0	1
	25 - 40	2	0	0	0	0	0	0	1	3
	Above 40	8	0	0	0	0	0	0	1	9
Sub-Total		11	0	0	0	0	0	1	2	14
State Forest										
Forest	0 - 8	0	0	0	0	0	0	0	0	0
	8 - 15	0	0	0	0	0	0	0	0	0
	15 - 25	0	0	0	0	0	0	0	0	1
	25 - 40	1	1	0	0	0	0	0	1	3
	Above 40	3	6	0	0	0	0	0	3	12
Sub-Total		4	8	0	0	0	0	0	4	16
Other Land Use	0 - 8	2	2	0	0	2	2	0	0	8
	8 - 15	6	7	1	2	8	5	0	1	30
	15 - 25	10	30	4	14	24	12	0	4	98
	25 - 40	32	78	15	66	56	30	0	9	286
	Above 40	184	323	65	217	122	103	0	18	1,031
Sub-Total		234	440	85	299	210	152	1	33	1,454
Sub-Total		238	448	85	299	210	152	1	37	1,470
Others	0 - 8	0	0	0	0	0	0	0	0	1
	8 - 15	0	0	0	0	0	1	0	0	2
	15 - 25	1	1	0	0	1	1	0	0	4
	25 - 40	1	2	0	2	2	1	0	0	7
	Above 40	2	4	1	5	3	3	0	1	19
Sub-Total		4	7	1	7	6	6	0	1	34
Grand-Total		5,112	4,786	974	3,808	1,057	777	360	405	17,279

Table 2.2.8 Landuse Area Classified by Sub-Basin

(unit : ha)

Land Use	Slope (%)	Watershed								Total
		Keduang	Tirtomoyo	Temon	Upper Solo	Alang	Ngunggahan	Wuryantoro	Remnant	
Paddy Field	0 - 8	3,717	2,616	1,070	2,186	2,390	1,764	676	80	14,499
	8 - 15	2,803	642	141	445	428	190	222	52	4,922
	15 - 25	2,104	583	76	415	219	176	116	29	3,717
	25 - 40	1,404	627	68	399	129	143	82	14	2,865
	Above 40	2,825	640	67	402	178	258	103	20	4,492
Sub-Total		12,852	5,107	1,422	3,846	3,344	2,530	1,199	195	30,495
Home Settlement Area										
Housing Yard and Garden	0 - 8	1,309	216	179	293	260	103	106	15	2,480
	8 - 15	1,022	180	67	151	100	47	41	13	1,620
	15 - 25	652	256	42	166	66	41	21	16	1,259
	25 - 40	344	298	25	164	45	26	10	20	933
	Above 40	469	286	10	131	50	26	10	14	997
Sub-Total		3,795	1,235	324	905	522	242	188	78	7,289
Upland Field	0 - 8	2,980	852	744	1,559	2,091	701	508	92	9,526
	8 - 15	1,939	471	208	582	528	187	166	72	4,152
	15 - 25	1,136	438	113	477	225	139	75	57	2,660
	25 - 40	549	424	52	340	116	68	34	34	1,617
	Above 40	657	371	19	261	96	78	19	20	1,520
Sub-Total		7,262	2,556	1,135	3,218	3,056	1,173	802	274	19,475
Sub-Total		11,057	3,791	1,459	4,123	3,578	1,415	990	352	26,764
Upland Field	0 - 8	1,389	587	506	1,027	3,145	435	433	135	7,656
	8 - 15	1,244	783	342	932	1,204	370	390	158	5,424
	15 - 25	1,338	1,351	291	1,467	961	477	314	234	6,433
	25 - 40	1,546	2,130	324	1,951	826	445	240	256	7,716
	Above 40	3,299	4,135	475	2,497	883	551	288	405	12,532
Sub-Total		8,815	8,986	1,938	7,873	7,019	2,277	1,664	1,188	39,761
Orchard/Plantation	0 - 8	1,056	359	343	399	308	323	131	100	3,019
	8 - 15	759	264	143	334	191	81	107	90	1,968
	15 - 25	622	430	114	529	252	119	97	115	2,277
	25 - 40	442	554	96	749	290	139	74	91	2,434
	Above 40	866	706	100	947	256	132	73	88	3,167
Sub-Total		3,745	2,313	796	2,959	1,296	794	481	483	12,867
Forest	0 - 8	17	0	0	0	0	0	9	2	28
	8 - 15	23	0	0	0	0	0	8	3	35
	15 - 25	33	1	0	0	0	0	7	8	49
	25 - 40	40	1	0	0	0	0	7	13	60
	Above 40	87	1	0	0	0	0	8	14	109
Sub-Total		199	3	0	0	0	0	39	39	281
State Forest										
Forest	0 - 8	17	2	0	0	0	0	0	2	22
	8 - 15	20	3	0	0	0	0	0	5	28
	15 - 25	28	9	0	0	0	0	0	14	52
	25 - 40	27	26	0	0	0	0	0	29	83
	Above 40	58	62	0	0	0	0	0	81	200
Sub-Total		151	103	0	1	0	0	0	131	385
Other Land Use	0 - 8	170	85	7	30	86	98	1	12	489
	8 - 15	170	117	16	58	144	96	2	22	624
	15 - 25	347	263	38	158	261	164	2	51	1,283
	25 - 40	767	523	98	372	362	233	5	85	2,445
	Above 40	3,479	1,425	397	860	594	585	20	195	7,554
Sub-Total		4,934	2,412	556	1,478	1,446	1,176	29	364	12,394
Sub-Total		5,085	2,514	556	1,478	1,446	1,176	29	494	12,779
Others	0 - 8	127	90	44	63	67	32	9	2	433
	8 - 15	38	40	15	31	32	5	1	0	162
	15 - 25	40	48	7	33	43	2	0	1	174
	25 - 40	47	65	8	53	57	2	0	2	234
	Above 40	92	107	14	92	57	5	0	12	381
Sub-Total		345	350	88	273	255	46	10	17	1,384
Grand-Total		42,098	23,064	6,259	20,552	16,938	8,239	4,412	2,768	124,331

Table 2.2.9 Annual Average Soil Loss/ha Classified by Sub-Basin

(unit : ton per hectare)

Land Use	Slope (%)	Watershed								Total
		Keduang	Tirtomoyo	Temon	Upper Solo	Alang	Ngunggungahan	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	0.68
	25 - 40	1.39	1.15	1.16	1.08	0.80	0.57	1.03	1.09	1.21
	Above 40	2.37	1.63	1.91	1.60	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	26.97	22.33	18.16	15.17	16.98	28.45	30.12	26.09
	8 - 15	104.13	101.33	91.15	82.18	47.65	57.87	96.45	99.31	96.18
	15 - 25	233.38	219.94	214.19	196.20	100.60	108.55	174.24	174.63	212.42
	25 - 40	479.52	461.59	444.28	422.99	195.42	217.04	316.57	215.49	434.26
	Above 40	1,060.57	813.36	818.75	698.04	362.17	489.48	398.15	221.00	870.75
Sub-Total		253.25	364.63	119.26	233.64	81.37	113.10	94.95	152.60	241.60
Upland Field	0 - 8	51.71	51.22	37.52	31.43	30.15	30.91	52.93	66.88	41.19
	8 - 15	172.64	178.16	155.42	141.48	104.50	123.17	184.45	190.94	157.93
	15 - 25	311.78	291.08	284.25	262.07	182.03	174.24	286.62	295.18	279.06
	25 - 40	540.06	483.95	517.90	448.08	324.47	308.50	449.04	371.54	474.62
	Above 40	999.89	734.23	899.99	687.74	501.38	495.93	703.48	447.54	812.14
Sub-Total		247.41	286.57	119.85	182.76	80.15	109.55	134.44	211.91	194.73
Sub-Total		249.41	312.00	119.72	193.93	80.33	110.16	126.93	198.78	207.50
Upland Field	0 - 8	29.55	30.63	30.04	23.26	15.08	17.86	23.73	40.43	22.08
	8 - 15	93.30	99.04	113.53	88.61	51.49	61.29	83.79	138.11	83.76
	15 - 25	145.09	183.20	245.64	188.88	84.90	123.79	138.16	216.00	159.29
	25 - 40	202.79	313.45	488.46	354.05	153.71	238.96	171.36	283.56	282.11
	Above 40	321.83	459.49	791.66	532.24	229.83	440.38	241.84	279.43	422.49
Sub-Total		195.83	323.93	340.37	305.20	74.21	192.52	118.38	221.90	229.36
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	30.47	36.72
	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	0.00	33.06	42.07
Other Land Use	0 - 8	13.42	17.96	22.11	13.50	20.58	15.57	56.14	20.45	16.27
	8 - 15	33.27	59.08	65.82	40.24	53.65	55.32	152.48	48.28	48.51
	15 - 25	28.40	114.48	108.48	89.36	90.18	74.48	42.85	82.05	76.49
	25 - 40	42.13	149.28	154.91	176.28	154.03	127.34	7.47	107.63	116.89
	Above 40	52.81	226.99	163.37	251.94	204.76	176.36	12.33	92.16	136.54
Sub-Total		47.40	182.41	153.43	202.35	145.44	129.13	22.51	89.46	117.27
Sub-Total		46.77	178.12	153.43	202.29	145.44	129.13	22.51	74.55	115.01
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		121.44	207.53	155.56	185.30	62.40	94.31	81.56	146.16	138.98

Table 2.2.12 Annual Average Soil Loss Classified by Terrace Type and Condition for Sub-Basin

(unit : thousand ton)

Land Use	Slope (%)	Watershed								Total
		Kedung	Tirtomoyo	Temon	Upper Solo	Alang	Ngunggahan	Wuryantoro	Remnant	
Upland Field										
Terrace Class										
Good Bench Terrace	0 - 8	0	0	0	0	1	0	0	0	1
	8 - 15	0	0	0	0	1	0	0	0	1
	15 - 25	0	0	0	0	1	0	0	0	1
	25 - 40	0	0	0	0	1	0	0	0	1
	Above 40	0	1	0	0	0	1	1	0	3
Sub-Total		0	1	0	1	3	1	1	0	7
Medium Bench Terrace	0 - 8	1	1	0	0	0	0	2	0	5
	8 - 15	2	2	0	1	1	0	9	1	16
	15 - 25	2	1	0	2	1	1	10	3	19
	25 - 40	3	4	0	2	2	1	7	5	24
	Above 40	8	17	0	3	4	2	12	8	54
Sub-Total		15	25	0	8	9	5	40	16	118
Fair to Bad Bench Terrace	0 - 8	29	6	11	4	38	1	6	1	96
	8 - 15	80	23	22	10	35	2	16	2	190
	15 - 25	135	62	24	31	25	5	15	7	303
	25 - 40	226	153	39	72	21	5	11	11	536
	Above 40	736	410	102	156	31	9	8	15	1,468
Sub-Total		1,205	653	199	273	150	22	56	36	2,594
Traditional Bench Terrace	0 - 8	7	2	0	7	0	2	1	2	22
	8 - 15	19	7	0	24	1	4	2	9	66
	15 - 25	25	23	0	86	1	12	3	26	176
	25 - 40	34	53	0	210	2	20	5	41	366
	Above 40	166	110	0	395	3	81	10	60	824
Sub-Total		252	195	0	722	7	119	21	138	1,453
Composite (No Treatment and Ridge Terrace)	0 - 8	4	9	4	12	8	5	1	2	45
	8 - 15	16	45	17	48	24	16	6	10	181
	15 - 25	33	162	47	159	54	41	16	14	525
	25 - 40	50	458	119	406	102	80	18	16	1,250
	Above 40	152	1,363	274	775	164	150	39	30	2,946
Sub-Total		254	2,037	461	1,399	351	292	79	73	4,947
Upland Field in Home Settlement Area	0 - 8	154	44	28	49	63	22	27	6	392
	8 - 15	335	84	32	82	55	23	31	14	656
	15 - 25	354	128	32	125	41	24	21	17	742
	25 - 40	297	205	27	152	38	21	15	13	768
	Above 40	657	272	17	180	48	39	14	9	1,235
Sub-Total		1,797	732	136	588	245	128	108	58	3,792
Sub-Total		3,523	3,643	796	2,991	766	567	305	322	12,912
Settlement Area										
Settlement Area	0 - 8	40	6	4	5	4	2	3	0	65
	8 - 15	106	18	6	12	5	3	4	1	156
	15 - 25	152	56	9	33	7	4	4	3	267
	25 - 40	165	138	11	70	9	6	3	4	405
	Above 40	497	232	8	92	18	13	4	3	868
Sub-Total		961	450	39	211	42	27	18	12	1,761
Upland Field in State Forest										
Terrace Class										
Good Bench Terrace	0 - 8	0	0	0	0	0	0	0	0	0
	8 - 15	0	0	0	0	0	0	0	0	0
	15 - 25	0	0	0	0	0	0	0	0	0
	25 - 40	0	0	0	0	0	0	0	0	0
	Above 40	0	0	0	0	0	0	0	0	0
Sub-Total		0	0	0	0	0	0	0	0	0
Medium Bench Terrace	0 - 8	0	0	0	0	0	0	0	0	0
	8 - 15	0	0	0	0	0	0	0	0	0
	15 - 25	0	0	0	0	0	0	0	0	0
	25 - 40	0	0	0	0	0	0	0	0	0
	Above 40	0	1	0	0	0	0	0	0	1
Sub-Total		1	1	0	0	0	0	0	1	2
Fair to Bad Bench Terrace	0 - 8	0	0	0	0	0	0	0	0	0
	8 - 15	1	1	0	0	0	0	0	0	3
	15 - 25	4	4	0	2	0	0	0	0	10
	25 - 40	16	14	0	4	0	0	0	0	35
	Above 40	88	75	0	11	0	0	0	0	175
Sub-Total		109	95	0	18	0	0	0	0	222
Traditional Bench Terrace	0 - 8	0	0	0	0	0	0	0	0	0
	8 - 15	0	0	0	0	0	0	0	0	1
	15 - 25	0	0	0	0	0	0	0	1	2
	25 - 40	2	0	0	2	0	0	0	3	7
	Above 40	13	0	0	4	0	2	0	4	24
Sub-Total		16	0	0	6	1	2	0	8	33
Composite (No Treatment and Ridge Terrace)	0 - 8	1	1	0	0	2	1	0	0	5
	8 - 15	2	4	1	0	7	4	0	0	20
	15 - 25	3	20	4	4	22	10	0	1	62
	25 - 40	9	50	11	19	51	24	0	2	166
	Above 40	52	216	51	71	102	81	0	3	576
Sub-Total		67	291	66	94	183	121	0	6	828
Upland Field in Home Settlement Area	0 - 8	0	0	0	0	0	0	0	0	0
	8 - 15	0	0	0	0	0	0	0	0	1
	15 - 25	1	0	0	0	0	0	0	0	1
	25 - 40	0	1	0	0	0	0	0	0	2
	Above 40	0	5	0	0	0	0	0	0	6
Sub-Total		2	6	0	0	0	1	0	0	10
Sub-Total		194	394	67	118	184	124	0	15	1,096

2.2.13 Area Classified by Terrace Type and Condition for Sub-Basin

(unit : ha)

Land Use	Slope (%)	Watershed								Total
		Keduang	Tirtomoyo	Temon	Upper Solo	Alang	Ngunggahan	Wuryantoro	Remnant	
Upland Field										
Terrace Class										
Good Bench Terrace	0 - 8	0	0	0	35	375	44	21	0	475
	8 - 15	0	0	0	36	133	36	7	0	213
	15 - 25	0	2	0	33	75	31	2	0	142
	25 - 40	0	4	0	18	36	22	3	0	83
	Above 40	0	11	0	9	19	22	7	0	68
Sub-Total		0	17	0	131	639	155	40	0	982
Medium Bench Terrace	0 - 8	41	71	0	62	107	13	165	23	482
	8 - 15	32	37	0	67	76	14	167	25	418
	15 - 25	25	16	0	52	57	25	113	45	334
	25 - 40	28	25	0	41	41	12	49	47	243
	Above 40	59	58	0	30	45	15	53	61	319
Sub-Total		184	206	0	253	326	79	547	201	1,796
Fair to Bad Bench Terrace	0 - 8	1,082	313	418	326	2,214	40	217	34	4,645
	8 - 15	968	407	247	135	533	37	166	17	2,509
	15 - 25	1,074	659	148	216	249	42	122	30	2,539
	25 - 40	1,254	966	127	294	126	25	88	24	2,905
	Above 40	2,624	1,796	198	439	109	22	57	18	5,263
Sub-Total		7,002	4,142	1,137	1,410	3,231	167	650	123	17,861
Traditional Bench Terrace	0 - 8	193	47	0	244	44	106	20	45	701
	8 - 15	150	61	0	240	46	72	20	64	654
	15 - 25	107	106	0	425	51	110	24	111	935
	25 - 40	86	142	0	582	46	111	35	116	1,119
	Above 40	236	171	0	706	68	221	55	176	1,633
Sub-Total		772	527	1	2,198	256	620	154	512	5,041
Composite (No Treatment and Ridge Terrace)	0 - 8	72	155	88	359	405	232	9	32	1,352
	8 - 15	95	278	95	453	416	211	29	52	1,630
	15 - 25	133	568	143	740	529	269	53	49	2,483
	25 - 40	178	993	197	1,016	576	274	65	68	3,367
	Above 40	379	2,099	277	1,312	642	272	116	151	5,249
Sub-Total		857	4,094	800	3,880	2,567	1,257	273	352	14,080
Upland Field in Home Settlement Area	0 - 8	2,980	852	744	1,559	2,091	701	508	92	9,526
	8 - 15	1,939	471	208	582	528	187	166	72	4,152
	15 - 25	1,136	438	113	477	225	139	75	57	2,660
	25 - 40	549	424	52	340	116	68	34	34	1,617
	Above 40	657	371	19	261	96	78	19	20	1,520
Sub-Total		7,262	2,556	1,135	3,218	3,056	1,173	802	274	19,475
Sub-Total		16,077	11,541	3,074	11,091	10,075	3,450	2,466	1,462	59,237
Settlement Area										
Settlement Area	0 - 8	1,309	216	179	293	260	103	106	15	2,480
	8 - 15	1,022	180	67	151	100	47	41	13	1,620
	15 - 25	652	256	42	166	66	41	21	16	1,259
	25 - 40	344	298	25	164	45	26	10	20	933
	Above 40	469	286	10	131	50	26	10	14	997
Sub-Total		3,795	1,235	324	905	522	242	188	78	7,289
Upland Field in State Forest										
Terrace Class										
Good Bench Terrace	0 - 8	0	0	0	0	0	0	0	0	0
	8 - 15	0	0	0	0	1	1	0	0	2
	15 - 25	0	0	0	0	1	1	0	0	1
	25 - 40	0	0	0	0	0	1	0	0	1
	Above 40	0	0	0	0	0	3	0	0	3
Sub-Total		0	0	0	0	2	5	0	0	8
Medium Bench Terrace	0 - 8	1	2	0	1	1	0	0	1	5
	8 - 15	1	1	0	0	1	0	0	0	4
	15 - 25	2	0	0	1	1	0	0	2	6
	25 - 40	2	0	0	1	1	0	0	2	6
	Above 40	3	2	0	1	2	0	0	4	12
Sub-Total		9	5	0	4	6	0	0	8	32
Fair to Bad Bench Terrace	0 - 8	20	12	0	2	1	0	0	0	36
	8 - 15	60	20	0	5	3	0	0	0	88
	15 - 25	162	44	0	11	10	0	0	0	228
	25 - 40	362	101	0	16	8	0	0	0	487
	Above 40	1,557	401	0	24	6	0	0	0	1,989
Sub-Total		2,161	578	2	58	29	1	0	0	2,829
Traditional Bench Terrace	0 - 8	0	0	0	0	1	0	0	2	4
	8 - 15	2	0	0	0	2	1	0	3	8
	15 - 25	6	1	0	1	3	1	0	6	18
	25 - 40	23	1	0	4	4	1	0	7	39
	Above 40	141	12	0	6	9	7	1	7	184
Sub-Total		172	14	0	12	20	10	2	24	253
Composite (No Treatment and Ridge Terrace)	0 - 8	25	25	5	4	45	37	0	1	142
	8 - 15	29	49	11	9	66	51	1	1	216
	15 - 25	62	120	22	29	104	84	0	3	424
	25 - 40	182	259	50	67	141	124	0	6	828
	Above 40	824	746	209	184	184	246	0	29	2,422
Sub-Total		1,123	1,198	297	293	539	542	2	40	4,033
Upland Field in Home Settlement Area	0 - 8	5	1	0	0	1	1	0	0	7
	8 - 15	4	1	0	0	1	1	0	0	7
	15 - 25	3	3	0	1	1	1	0	0	8
	25 - 40	2	5	0	1	1	1	0	0	10
	Above 40	1	10	0	0	1	1	0	0	14
Sub-Total		15	19	0	2	5	4	0	0	46
Sub-Total		3,480	1,815	298	368	602	562	3	73	7,201

Table 2.2.14 Annual Average Soil Los/ha in the Upland Field Classified by Terrace Type and Condition for Sub-Basin

Land Use	Slope (%)	Watershed								Total
		Keduang	Tirtomoyo	Temon	Upper Solo	Alang	Ngunggahan	Wuryantoro	Remnant	
(unit : ton per hectare)										
Upland Field										
Terrace Class										
Good Bench Terrace	0 - 8	0.00	2.66	0.00	1.69	1.51	0.82	5.10	0.00	1.62
	8 - 15	0.00	5.40	0.00	4.72	5.04	3.67	10.69	0.00	4.95
	15 - 25	0.00	21.40	0.00	8.82	8.49	6.06	26.85	0.00	8.39
	25 - 40	0.00	41.02	0.00	16.99	14.67	12.42	42.43	0.00	16.94
	Above 40	0.00	69.71	0.00	34.45	23.70	31.07	69.68	0.00	39.64
Sub-Total		0.00	55.82	0.00	8.55	4.49	8.44	21.66	0.00	7.25
Medium Bench Terrace	0 - 8	16.21	18.36	0.00	5.70	4.47	6.91	14.66	7.36	11.36
	8 - 15	49.03	52.99	0.00	15.87	13.64	25.60	53.93	27.24	37.51
	15 - 25	70.65	65.04	0.00	28.85	22.68	41.64	87.86	63.94	58.32
	25 - 40	101.60	156.47	0.00	51.90	41.35	73.76	147.78	104.18	97.10
	Above 40	140.29	290.99	0.00	88.30	99.77	148.83	220.62	126.86	168.00
Sub-Total		81.69	121.10	0.00	30.46	27.50	58.46	73.46	81.26	65.60
Fair to Bad Bench Terrace	0 - 8	26.67	18.43	25.73	13.70	17.20	19.08	29.25	28.69	20.67
	8 - 15	82.31	57.39	90.00	71.02	65.74	63.12	96.95	118.09	75.82
	15 - 25	125.37	93.52	163.39	141.94	99.64	125.40	120.49	249.18	119.41
	25 - 40	180.22	157.81	310.37	243.63	165.52	178.97	120.88	446.27	184.61
	Above 40	280.52	228.18	517.80	355.78	288.71	406.76	148.66	812.29	278.97
Sub-Total		172.13	157.69	174.84	193.29	46.49	131.01	86.55	292.52	145.23
Traditional Bench Terrace	0 - 8	37.94	38.94	41.98	29.71	7.69	20.63	36.84	41.58	30.82
	8 - 15	127.89	119.08	109.65	100.63	16.80	58.21	85.62	142.34	101.58
	15 - 25	235.95	214.71	223.28	201.55	24.82	104.65	127.62	237.33	188.25
	25 - 40	397.53	373.40	418.21	360.97	46.60	182.61	145.68	349.82	326.70
	Above 40	701.18	641.79	0.00	558.80	40.78	365.25	181.16	343.61	504.63
Sub-Total		325.75	369.38	167.97	328.41	28.58	191.56	133.21	270.22	288.30
Composite (No Treatment and Ridge Terrace)	0 - 8	57.88	58.47	50.54	32.74	19.66	20.23	68.73	74.60	33.37
	8 - 15	165.96	161.69	174.41	104.98	58.85	74.14	196.06	193.55	110.99
	15 - 25	245.27	285.11	330.83	214.68	101.33	152.74	294.87	286.42	211.41
	25 - 40	283.58	461.45	602.97	400.07	176.60	292.80	278.37	237.19	371.31
	Above 40	399.44	649.13	987.01	590.44	255.09	552.81	336.52	201.33	561.29
Sub-Total		296.95	497.59	575.82	360.65	136.93	232.20	290.32	207.27	351.37
Upland Field in Home Settlement Area	0 - 8	51.71	51.22	37.52	31.43	30.15	30.91	52.93	66.88	41.19
	8 - 15	172.64	178.16	155.42	141.48	104.50	123.17	184.45	190.94	157.93
	15 - 25	311.78	291.08	284.25	262.07	182.03	174.24	286.62	295.18	279.06
	25 - 40	540.06	483.95	517.90	448.08	324.47	308.50	449.04	371.54	474.62
	Above 40	999.89	734.23	899.99	687.74	501.38	495.93	703.48	447.54	812.14
Sub-Total		247.41	286.57	119.85	182.76	80.15	109.55	134.44	211.91	194.73
Sub-Total		219.13	315.66	258.91	269.67	76.01	164.32	123.60	220.03	217.98
Settlement Area										
Settlement Area	0 - 8	30.88	26.97	22.33	18.16	15.17	16.98	28.45	30.12	-26.09
	8 - 15	104.13	101.33	91.15	82.18	47.65	57.87	96.45	99.31	96.18
	15 - 25	233.38	219.94	214.19	196.20	100.60	108.55	174.24	174.63	212.42
	25 - 40	479.52	461.59	444.28	422.99	195.42	217.04	316.57	215.49	434.26
	Above 40	1,060.57	813.36	818.75	698.04	362.17	489.48	398.15	221.00	870.75
Sub-Total		253.25	364.63	119.26	233.64	81.37	113.10	94.95	152.60	241.60
Upland Field in State Forest										
Terrace Class										
Good Bench Terrace	0 - 8	0.00	0.00	0.00	0.00	4.00	4.08	0.00	0.00	4.04
	8 - 15	0.00	0.00	0.00	0.00	7.87	11.93	0.00	0.00	9.23
	15 - 25	0.00	0.00	0.00	0.00	15.07	23.83	0.00	0.00	19.71
	25 - 40	0.00	1.49	0.00	0.00	26.41	44.16	0.00	0.00	34.78
	Above 40	0.00	2.40	0.00	0.00	47.36	65.50	0.00	0.00	64.12
Sub-Total		0.00	1.72	0.00	0.00	12.72	46.90	0.00	0.00	35.21
Medium Bench Terrace	0 - 8	27.12	19.83	0.00	4.69	0.18	0.00	0.00	15.07	16.04
	8 - 15	52.74	55.82	0.00	9.10	0.63	0.00	0.00	40.98	31.96
	15 - 25	92.93	117.93	0.00	25.21	1.17	0.00	0.00	37.92	46.06
	25 - 40	131.51	182.38	0.00	50.95	4.33	0.00	0.00	104.31	82.92
	Above 40	38.47	293.68	0.00	68.76	72.98	0.00	0.00	111.20	108.69
Sub-Total		67.43	131.08	0.00	41.94	20.91	0.00	0.00	86.08	70.58
Fair to Bad Bench Terrace	0 - 8	6.14	18.71	39.23	26.82	1.16	36.43	0.00	0.00	11.68
	8 - 15	17.68	49.06	83.64	83.92	3.15	106.40	0.00	156.49	28.64
	15 - 25	23.73	98.99	163.38	143.94	6.24	202.53	0.00	271.57	43.88
	25 - 40	43.30	142.04	294.06	280.12	10.84	0.00	0.00	362.44	71.15
	Above 40	56.50	187.11	463.41	466.97	23.80	302.48	0.00	0.00	87.80
Sub-Total		50.29	164.23	231.46	305.78	10.83	137.39	0.00	294.15	78.57
Traditional Bench Terrace	0 - 8	25.35	1.32	0.00	43.69	17.48	43.14	0.00	60.75	40.70
	8 - 15	46.10	5.52	0.00	90.05	18.34	86.63	3.06	127.04	71.80
	15 - 25	53.39	11.51	0.00	238.61	24.53	137.06	11.72	241.03	122.21
	25 - 40	78.80	20.73	0.00	443.89	32.99	164.12	18.68	415.67	166.13
	Above 40	95.38	37.36	0.00	622.45	40.17	231.11	30.92	543.14	128.05
Sub-Total		90.94	34.20	0.00	496.16	32.46	199.41	27.89	348.24	130.22
Composite (No Treatment and Ridge Terrace)	0 - 8	35.43	31.04	29.74	19.16	36.51	33.97	97.71	24.74	34.08
	8 - 15	74.69	88.39	88.99	50.41	108.55	85.72	219.45	79.59	91.13
	15 - 25	44.60	166.18	157.60	135.66	207.50	116.84	354.80	198.87	146.44
	25 - 40	51.48	193.83	224.08	275.80	362.04	194.31	0.00	252.91	200.17
	Above 40	62.76	289.74	242.53	387.52	551.16	330.77	0.00	113.29	237.78
Sub-Total		59.62	243.21	223.89	321.45	339.26	222.92	205.03	138.96	205.42
Upland Field in Home Settlement Area	0 - 8	39.90	53.45	0.00	9.56	29.62	24.33	0.00	0.00	39.02
	8 - 15	123.13	59.35	0.00	38.64	44.31	155.65	0.00	0.00	105.58
	15 - 25	206.56	86.08	0.00	160.35	80.19	103.54	0.00	0.00	130.39
	25 - 40	222.85	263.06	0.00	268.71	110.42	237.69	0.00	23.72	229.20
	Above 40	187.14	465.72	0.00	245.72	153.12	194.49	0.00	32.72	389.35
Sub-Total		126.75	329.35	0.00	206.61	91.67	151.25	0.00	43.77	212.96
Sub-Total		55.69	217.03	223.94	321.07	306.56	220.28	119.51	202.35	152.21

Table 2.2.15 Basic Directions for Formulation of Non-structural Conservation Measures ^{1/}

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		Fair to Poor Quality Bench Terrace & Traditional Terrace		Composite 3/		
	Proportion of		Project Works: Terrace Improvement Works		Project Works: Terrace Formation/Upgrading Works		
	Annual Crop	Tree Crop/Tree	Physical Measures	Vegetative Measures	Physical Measures	Vegetative Measures	
0 - 8 %	90%	105%	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%	25%	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%	50% 5/	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 fringe of housing yard
25 - 40 %	25%	75% 5/	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	
> 40 %	-	100% 5/	Improved Bench Terrace	Vegetating lip for stabilization Vegetating riser for stabilization	Improved Bench 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

Table 2.2.18 Assessment of Candidate Grasses Trees for Vegetative Conservation Measures in DAS Wonogiri (1/2)

Plant	Characteristics	Vegetative Cover	Establishment	Economic/ Fodder Value	Assessment Based on Field Performances								Remarks	
					Target Areas/Purposes									
					Terrace		Cover Crop	Gully Bank	Roadside	Slope	Riverbank			
Lip	Riser													
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	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	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	NS	- Preferred as fodder crop by farmers
d. <i>Brachyaria brizantha</i> (BB/Blambung)	- Creeping grass for slope stabilization - Fodder crops - Introduced in DAS	○	○	△	△	MS	S	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	NS	- Lip & riser protection in IBRD Project, performance poor - Grass production lower than a, b, c
f. Star grass (<i>Cynodon nenufluensis</i>)	- Creeping grass applied for gully slope stabilization - Not so good as fodder crops	○	○	△	△	MS	MS	S	S	S	S	S	S	- Lip & riser protection in IBRD Project, performance poor
g. Vertiver (<i>Vetiveria 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	MS-S	S	S	S	S	S	- Lip & riser protection in IBRD Project, uprooted & used as herb by farmers
h. Centrocema	- Creeping legume, long time to be established - Could be used for riser protection	○	○	×	×	MS	MS	S	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	NS	- 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 - Very suitable for riverbank slope protection; not in Indonesia													- Not yet introduced in the past projects
l. <i>Paspalum notatum</i>	Creeping grass for gully slope stabilization													- Not yet introduced in the past projects

Table 2.2.18 Assessment of Candidate Grasses Trees for Vegetative Conservation Measures in DAS Wonogiri (2/2)

Plant	Characteristics	Vegetative Cover	Establishment	Economic/ Fodder Value	Assessment Based on Field Performances							Remarks
					Target Areas/Purposes							
					Terrace	Riser	Farm/land / Forest	Cover Crop	Gully Bank	Roadside	Riverbank	
2. Trees												
a. Teak	- Minor ground cover - Leaves used as fuel & ground remains bare - Main tree in State Forest	△	○	◎	NS	-	S	-	NS	-	NS	- Peoples Forest Program in IBRD Project & Gerhan
b. Merkusii pine (<i>Pinus merkusii</i>)	-	△	△	○	NS	-	S	-	NS	-	NS	- Not introduced in IBRD Project
c. Mahogany (<i>Swietenia machtoyliia</i>)	- Commonly planted in DAS	△	○	○	NS	-	S	-	MS	-	NS	- Not introduced in IBRD Project - Introduced in AMHR
d. Eucalyptus (<i>Eucalyptus degluptia</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 - Riverbank protection vegetative barriers	△	○	○	NS	-	MS	-	S	-	S	- Not introduced in IBRD Project
o. <i>Salix babilonica</i>	-	not tested in Indonesia										

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

Table 2.2.19 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. Giriwiryu	○						○	○						
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 Teteggian Tempat, Curah Hujan dan Potensi Tanaman Hortikultura dan Aneka Tanaman

- Potensi Sumber Daya Alam Lainnya yang akan Dikembangkan

Table 2.2.20 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	20~25 cm in row 20~25 cm in row 20~25 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>Glyricideae 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)	20~25 x 20~25 cm 20~25 x 20~25 cm 20~25 x 20~25 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 Slope Class: 0 - 8% - Land Use: • Annual crop: 90 % • Perennial crop: 10 % Slope Class: > 8 - 15% - Land Use: • Annual crop: 75 % • Perennial crop: 25 % Slope Class: 15 - 25 % - Land Use: • Annual crop: 50 % • Perennial crop: 50 % Slope Class: > 25 - 40 % - Land Use: • Annual crop: 25 % • Perennial crop: 75 % Slope Class: > 40 % - Land Use: • Perennial crop: 100 %	Fruit/Estate Crop: - Category A Mango, durian, rambutan, Cashew nut, clove - Category B Cacao, mlinjo, citrus Tree: - Teak, mahogany, sengon, sonokeling Fruit: - Category A Mango, durian, rambutan, Cashew nut, clove - Category B Cacao, mlinjo, citrus Tree: - Mahogany, sonokeling, sengon	Slope Class: 0 - 8% - Category A & Tree (±10 ~ 20 trees/ha) - Category B (±40 trees/ha)	- Proposed proportion of tree crop/tree 90 % fruit/estate crops & 10 % tree (Cacao : 100 trees/ha) (Cacao : 100 trees/ha)
		Slope Class: > 8 - 15% - Category A & Tree (±25 ~ 50 trees/ha) - Category B (±100 trees/ha)	- Proposed proportion of tree crop/tree 90 % fruit/estate crops & 10 % tree (Cacao : 250 trees/ha)
		Slope Class: 15 - 25 % - Category A & Tree (±50 ~ 100 trees/ha) - Category B (±200 trees/ha)	- Inter-cropped with medicinal crops (empon-empon) (Cacao : 500 trees/ha) (Cacao : 500 trees/ha)
		Slope Class: > 25 - 40 % - Category A & Tree (±75 ~ 150 trees/ha) - Category B (±300 trees/ha)	- Inter-cropped with medicinal crops (empon-empon) (Cacao : 750 trees/ha)
		Slope Class: > 40 % - Category A & Tree (±100 ~ 200 trees/ha) - Category B (±400 trees/ha)	- 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>)	20~25 x 50 cm	- To reduce soil erosion from housing yard

1/: Fodder production: production of fresh fodder

Table 2.2.27 Basic Countermeasures for Watershed Conservation in the Wonogiri 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		
					No conservation works planned		Target Place/Vegetative Measures/Agro-forestry
Upland Field with Bench Terrace	All Classes	Good Quality Bench Terrace	US1~4T1	<p>1. Terrace Bench (cultivated area)</p> <p>(1) Agro-forestry & Land Use Modification</p> <p>1) Slope Class: 0 - 8 %</p> <p>2) Slope Class: 90% + Tree crops/trees 10%</p> <p>3) Slope Class: 8 - 15 %</p> <p>4) Slope Class: 75% + Tree crops/trees 25%</p> <p>5) Slope Class: >15 - 25 %</p> <p>6) Slope Class: 50% + Tree crops/trees 50%</p> <p>7) Slope Class: >25 - 40 %</p> <p>8) Land use conversion to orchard</p> <p>9) Tree crops/trees 75% + Annual crops 25%</p> <p>10) Slope Class: >40 %</p> <p>11) Land use conversion to orchard/forest</p> <p>12) Tree crops/trees 100%</p>	<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 • 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 cleaning 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>I. 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 % 2) Annual crops 90% + Tree crops/trees 10% 3) Slope Class: 8 - 15 % 4) Annual crops 75% + Tree crops/trees 25% 5) Slope Class: >15 - 25 % 6) Annual crops 50% + Tree crops/trees 50% 7) Slope Class: >25 - 40 % 8) Land use conversion to orchard 9) Tree crops/trees 75% + Annual crops 25% 10) Slope Class: >40 % 11) Land use conversion to orchard/forest 12) 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 (lamtaro)</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>Brachyaria 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 • Tree crop/tree seedling • Fertilizer/compost • Labor cost (incentives) <ul style="list-style-type: none"> - Farming support • 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	US1~5T2~3	<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 cleaning 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>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 (lamtaro)</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>Brachyaria 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 • Tree crop/tree seedling • Fertilizer/compost • Labor cost (incentives) <ul style="list-style-type: none"> - Farming support • 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 	

Table 2.2.27 Basic Countermeasures for Watershed Conservation in the Wonogiri 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 ~ S4T4	<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>2-2. Waterway & Drop Structure Construction</p> <p>1) Construction of waterway & drop structure</p>	<p>Target Place/Vegetative Measures/Agro-forestry</p> <p>2. Terrace Formation/Upgrading Works</p> <p>1. Terrace Lip</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>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>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>Provision of:</p> <ul style="list-style-type: none"> - Agro-forestry Development - Tree crop/tree seedling - Fertilizer/compost - Labor cost (incentives) <ul style="list-style-type: none"> - Farming support - 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>3-1. Construction of Improved Ridge Terrace</p> <p>1) Construction or upgrading of ridge terrace</p> <p>3-2. Waterway & Drop Structure Construction</p> <p>1) Construction of waterway & drop</p> <p>No physical measures planned</p>	<p>3. Ridge Terrace Formation/Upgrading Works</p> <p>1. Terrace Lip</p> <p>1) Vegetating lip with grasses or shrubs with economic use (fodder, fuel)</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>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"> - Agro-forestry Development - Farming support <p>Extension Services:</p> <ul style="list-style-type: none"> - Leucaena leucocephala (lamtoro) - Glyricideae - Jatropha curcas <p>Tree Crops/Trees (+ medical crops + Cover Crop/Grasses)</p>
Housing 2/	> 8%		HS2 ~ S5		<p>Provision of:</p> <ul style="list-style-type: none"> - Tree seedling - Labor cost (incentives) 	

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

Table 2.2.28 Land Management Agricultural Promotion Measures in Dry Farm Land (1/2)

Subject/Measures	Description/Objectives
<p>1. Land Management for Soil & Water Conservation</p> <p>1-1. Farm Land Improvement</p> <ul style="list-style-type: none"> - Dissemination of benefits of soil & water conservation - Terrace management - Soil management/improvement - Soil surface cover management/improvement <p>1-2. Land Use Modification/Conversion</p>	<ul style="list-style-type: none"> - Dissemination of benefits of soil & water conservation through mass guidance & other extension activities integrated with implementation of soil & water conservation measures - Terrace improvement with adequate vegetative measures; soil & water conservation measures - Improvement of soil chemical & physical properties & soil productivity through; <ul style="list-style-type: none"> • Application of organic fertilizer or matter; dissemination of quality compost making • Introduction of cover/fodder crops in MT II to apply organic matter & provide vegetative cover • Planting of seasonal grasses or legumes for soil improvement & livestock development - Improvement soil surface cover through; <ul style="list-style-type: none"> • Mulching using crop residues, especially in MT II • Introduction of cover/fodder crops in MT II to provide vegetative cover & apply organic matter • Introduction of riley cropping by multiple cropping of palawija of different growth duration; ex. maize 110 days + soybeans 90 days • Cultivation of leguminous crops of favorable surface cover in the edge of terrace; ex. maize in center of bench with groundnut in the edge - Land use conversion of farm land to orchard/forest in critical lands of slope class > 40 %; aiming at land productivity improvement & soil conservation - Establishing soil conservation oriented land use by promoting agro-forestry measures - Promotion of planting perennial crops to reduce labor requirements in farming; next generation appears to have less interested in farming & labor shortage problems slated
<p>2. Agro-forestry Promotion</p> <p>2-1. Promotion of Agro-forestry</p>	<ul style="list-style-type: none"> - Promotion of agro-forestry as a measure for agricultural promotion as well as soil & water conservation based on land suitability, marketability & paying due consideration to annual & long term productivity & economic value; selection of plants should be based on beneficiaries preference - Collaborative & integrated measures of agricultural (estate & fruit crops) & forestry measures in promotion of agro-forestry
<p>3. Improvement of Pekarangan Use</p> <p>3-1. Improvement of Vegetative Cover & Productivity</p>	<ul style="list-style-type: none"> - Establishment of well managed pekarangan with sufficient tree crops & improved land forms - Modification of land use in pekarangan toward soil & water conservation oriented use

Table 2.2.28 Land Management Agricultural Promotion Measures in Dry Farm Land (2/2)

Subject/Measures	Description/Objectives
<p>4. Crop Sub-sector Measures</p> <p>4-1. Improvement of Cropping System</p> <p>1) Improvement of Cropping Pattern</p> <ul style="list-style-type: none"> - Single Cropping in MT 1 <ul style="list-style-type: none"> • Maize/Cassava - Fallow • Multiple Crops with Beans/Cassava - Fallow • Multiple Crops without Beans/Cassava - Fallow <p>- Double Cropping in MT 1 & MT 2</p> <ul style="list-style-type: none"> • Maize/Cassava - Maize • Multiple Crops with beans/Cassava - Beans • Multiple Crops without beans/Cassava - Beans <p>2) Improvement of Farming Practices</p> <p>4-2. Technology Development</p> <p>4-3. Palawija Seed Production</p>	<p>Improvement of Cropping Pattern & System</p> <ul style="list-style-type: none"> - Improvement of productivity & inclusion of beans in MT 1 (ex. rows of beans in the lower edge of terrace bench) - Inclusion of beans/drought tolerant crops in MT II; inclusion of leguminous cover crops in MT II - Preventing cassava planting on terrace lip & riser - Inclusion of beans/drought tolerant crops in MT II; inclusion of leguminous cover crops/sorghum in MT II - Inclusion of beans/drought tolerant crops in MT II; inclusion of leguminous cover crops/sorghum in MT II - Improvement of productivity & inclusion of beans in MT 1 (ex. rows of beans in the lower edge of terrace bench) - Preventing cassava planting on terrace lip & riser - Improvement of productivity & inclusion of beans in MT 1 (ex. rows of beans in the lower edge of terrace bench) - Inclusion of beans or leguminous cover crops in MT II - Preventing cassava planting on terrace lip & riser - Improvement of productivity of beans in MT I - Preventing cassava planting on terrace lip & riser - Improvement of productivity & inclusion of beans in MT 1 (ex. rows of beans in the lower edge of terrace bench) - Inclusion of beans or leguminous cover crops in MT II - Preventing cassava planting on terrace lip & riser - Improvement of productivity & inclusion of beans in MT 1 (ex. rows of beans in the lower edge of terrace bench) - Preventing cassava planting on terrace lip & riser - Appropriate fertilization including organic fertilizer; technical training on quality compost preparation - Use of quality seeds, especially in MT I - Introduction of mulching & stable mulch; minimum tillage in MT II - Adaptability test of promising bean varieties - Riley cropping to ensure vegetative cover in critical period for erosion from January to March - Adaptability test of shade tolerant crops, drought tolerant crops & other promising crops - Technology development on tree crops production on long term basis - Activation of Seed Farm through renovation & capacity building - Development of soybeans & groundnut seed production technology by the Seed Farm - Formation of palawija seed growers farmer groups & production/supply of seeds in a district
<p>5. Livestock Sub-sector Measures</p> <p>5-1. Livestock Promotion</p>	<ul style="list-style-type: none"> - Implementation of livestock promotion programs (such as introduction of quality breeds & improved of feeding practices and strengthening of veterinary & extension services) integrated with soil conservation vegetative measures

Table 2.2.33 Descriptions of Support Programs for Soil & Water Conservation Measures and Land Management & Agricultural Promotion Measures (1/4)

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	- 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	- Target areas & beneficiary farmers of soil & water conservation measures	- 1 unit per 5 KZTA group candidates 1 KZTA per 25 farmers/20ha	Direct cost: 3.0 Admin. cost: 0.3 Program cost: 3.3 Total Program Cost Volume 334 Estimated Cost 1,102
1-2 Farmer Groups Empowerment Program (1) Key Farmer Training Program	- Training of key farmer of KZTA on technical & administrative issues on soil & water conservation measures - 1 training, 25 participants, 3 days course (including OIT)	- Key farmers of KZTA	- 1 training per 25 KZTA/500ha	Direct cost: 10.0 Admin. cost: 1.0 Program cost: 11.0 Total Program Cost Volume 67 Estimated Cost 737
(2) Conservation Demonstration Program	- Demonstration of proposed soil & water conservation measures by key farmers received Key Farmer Training - Target activities: • Terrace improvement & upgrading/formation works • Terrace lip & riser stabilization works • Agro-forestry development • Improved farming practices - Plot size: ± 1.0ha	- Target areas of soil & water conservation measures - Member farmers of KZTA	- 1 plot per 200ha of target areas for soil & water conservation measures	Direct cost: 10.0 Admin. cost: 1.0 Program cost: 11.0
(3) Mass Guidance Program	- Provision of mass guidance to KZTA members on proposed soil & water conservation measures demonstrated in a demonstration plot through opening Farmer Field Days	- Target areas of soil & water conservation measures - Member farmers of KZTA	- 1 guidance per 5KZTA/100ha	Total Program Cost Volume 167 Estimated Cost 1,837
(4) Need Inventory Meeting	- Consultation meeting for inventorying farmers needs for rice species for agro-forestry development held by Key Farmer & field extension staffs	- Target areas of soil & water conservation measures - Member farmers of KZTA	- 1 workshop per KZTA/20ha	Direct cost: 0.5 Admin. cost: 0.1 Program cost: 0.6 Total Program Cost Volume 1,670 Estimated Cost 919
2. Package Program for Operation/Implementation of Conservation Measures 2-1 Terrace Formation Guidance Program (1) Technical Guidance	- 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	- Target areas of soil & water conservation measures - Member farmers of KZTA	- 1 guidance per KZTA/20ha	Direct cost: 0.5 Admin. cost: 0.1 Program cost: 0.6 Total Program Cost Volume 1,670 Estimated Cost 919
(2) Support Package 1) Grasses/Tree Seedlings Supply for Terrace Stabilization 2) Labor Costs Subsidy for Terrace Formation Works	- Provision of grasses/shrub seedlings used for terrace lip & riser and ridges stabilization - Subsidy for labor costs required for terrace improvement or upgrading works - Rate of subsidy: 50 % of required labor costs	- Target areas of soil & water conservation measures - Member farmers of KZTA - Target areas of soil & water conservation measures - Member farmers of KZTA	- 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 2.2.33 Descriptions of Support Programs for Soil & Water Conservation Measures and Land Management & Agricultural Promotion Measures (2/4)

Program	Objectives/Description	Target Area & Groups	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	Direct cost: 0.5 Admin. cost: 0.1 Program cost: 0.6 Total Program Cost Volume 1,670 Estimated Cost 919
(2) Support Package 1) Tree Crops/Tree Seedlings Supply 2) Farm Inputs 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 - Member farmers of K2TA	- Target areas of soil & water conservation measures in each year - Implemented by K2TA/20ha - Target areas of soil & water conservation measures in each year - Implemented by K2TA/20ha	Estimated for each subject area & land unit Estimated for each subject area & land unit
2-3 Farming Support Program (1) Technical Guidance	- 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	Direct cost: 0.5 Admin. cost: 0.1 Program cost: 0.6 Total Program Cost Volume 1,670 Estimated Cost 919
(2) Support Package	- 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	Estimated for each subject area & land unit
2-3 Field Guidance Program (1) Inception Technical Guidance & Support	- 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	Program cost: 3.0 Total Program Cost Volume 67 Estimated Cost 201
(2) Follow-up 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: 1.0 Total Program Cost Volume 67 Estimated Cost 67
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: 10.0 Admin. cost: 1.0 Program cost: 11.0 Total Program Cost Volume 10 Estimated Cost 110
Total for Support Programs for Soil & Water Conservation Measures				8,097

Table 2.2.33 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	Direct cost: 3.0 Admin. cost: 0.3 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 KZTAGs	Direct cost: 5.0 Admin. cost: 0.5 Program cost: 5.5 Total Program Cost Volume 67 Estimated Cost 369
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 KZTAGs - Field days: 3 times	Direct cost: 10.0 Admin. cost: 1.0 Program cost: 11.0 Total Program Cost Volume 67 Estimated Cost 737
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 KZTAGs - Field days: 3 times x 2 season	Direct cost: 20.0 Admin. cost: 2.0 Program cost: 22.0 Total Program Cost Volume 33 Estimated Cost 726
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 - 180 project villages	Direct cost: 10.0 Admin. cost: 1.0 Program cost: 11.0 Total Program Cost Volume 180 Estimated Cost 1,980
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	- KZTAGs of the target areas of soil & water conservation measures - Representatives of KZTAGs	- 1 unit/25 KZTAGs or 500 ha of target area	Direct cost: 5.0 Admin. cost: 0.5 Program cost: 5.5 Total Program Cost Volume 67 Estimated Cost 369
4-2 Mass Guidance/Campaign/Workshop	- Mass guidance/campaign on specific subjects by deaa 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) - 180 project villages	Direct cost: 3.0 Admin. cost: 0.3 Program cost: 3.3 Total Program Cost Volume 360 Estimated Cost 1,188

Table 2.2.33 Descriptions of Support Programs for Soil & Water Conservation Measures and Land Management & Agricultural Promotion Measures (4/4)

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	- 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 - Supporting seed growers for 1 crop - Motivating farmers to use qualified palawija seed through desa level campaign	- Irrigated paddy fields - Group of advanced farmers	- 1 unit/year	Direct cost: 50.0 Admin. cost: 5.0 Program cost: 55.0 Total Program Cost Volume 5 Estimated Cost 275
5-2 Seed Campaign		- Target areas of soil & water conservation measures - Areas where adaptation rate of quality seeds is still low	- 1 campaign per desa or plural desa	Direct cost: 3.0 Admin. cost: 0.3 Program cost: 3.3 Total Program Cost Volume 90 Estimated Cost 297
6. Livestock Promotion Program				
6-1 Farmer & Farmer Group Training Program	- Training of representatives of farmers/farmer group in class or practical training - Subject: improved livestock farming practices, animal health, improvement of genetic resources etc. - 3 days per course; 20-30 participants/course - Provision of mobile veterinary services unit to strengthening veterinary services provided by a district office	- K2TAGs of the target areas of soil & water conservation measures - Representatives of K2TA	- 1 unit/25 K2TA or 500 ha of target area	Direct cost: 5.0 Admin. cost: 0.5 Program cost: 5.5 Total Program Cost Volume 67 Estimated Cost 369
6-2 Veterinary Services Strengthening	- Provision of cow for a farmer group aiming at genetic resources improvement & cattle population increase - Provision of 10 cows for each farmer group	- Veterinary Sub-services Office, Wonogiri	- 2 units	Program cost: 400
6-3 Livestock Quality Improvement Program 3/		- K2TAGs of the target areas of soil & water conservation measures	- 10 farmer groups/year - Total 3 units	Program cost: 340.0 Volume 3.0 Estimated Cost 1,020
7. Strengthening of Logistic Support for Extension Activities				
7-1. Kecamatan Level	- Provision of motorcycles, training equipment & office facilities for strengthening of logistic support for PPLs/PKIs in the catchment area	- BPPs or branch offices of District - 20 BPPs in Wonogiri & 3 branch offices in Pacitan; in total 23 kecamatan	- 1 package per target kecamatan - Motor cycle: 3 units - Training equipment: 1 set - Office facility: 1 set	Program cost: 65 (Motor cycle: 45.0) (Equipment: 10.0) (Facility: 10.0)
7-2. District level	- Provision of vehicle for intensifying extension & guidance activities by district staffs	- District Agriculture Services Office & Forestry Sub-services Office, Wonogiri	- 2 4 wheel vehicles for each Office	Program cost: 640
Total for Support Program3 for Land Management & Agricultural Promoi				8,468
Total for Support Programs				16,565

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 2.2.34 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 Admin. cost: 0.3 Program cost: 3.3 X 180 villages 594.0
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 Admin. cost: 0.2 Program cost: 2.2 X 180 villages 396.0
(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 Admin. cost: 0.1 Program cost: 0.6 X 180 villages 108.0
(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 Admin. cost: 0.2 Program cost: 2.2 X 180 villages 396.0
(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 Admin. cost: 0.1 Program cost: 0.6 X 180 villages 108.0
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 Admin. cost: 0.2 Program cost: 2.2 X 180 villages 396.0

1/: Estimated based on cost of JICA village survey

2/: Administrative cost assumed to be about 10% of program direct cost

Table 2.2.34 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	- To explain the village grant fund (amount, eligibility of use, non-eligibility of use, operation and management)	- Key informant, village and hamlet administration, existing village	- One day explanation meeting	Direct cost: 2.0
(1) Explanation of guideline	- To provide one local NGO for the village meeting	- Implementation Committee	- One local NGO	Admin. cost: 0.2
(2) Formulation of draft plan	- To prepare the draft plan (items to be done, budget allocation, person in charge for fund operation and management, auditing, booking etc.)	- Implementation Committee	- Technical assistance to be made by local NGO	Program cost: 2.2
(3) Consensus building	- To provide one local NGO from time to time	- Implementation Committee	- One day workshop per village	X 180 villages 396.0
	- To carry out socialization program on the draft plan	- Key informant, village and hamlet administration, existing village	- One facilitator	Direct cost: 1.0
	- To build consensus amongst village people for the draft plan	- Implementation Committee		Admin. cost: 0.1
	- To provide one facilitator for consensus building workshop	- Implementation Committee		Program cost: 1.1
				X 180 villages 198.0
3-2 Agreement with Executing Agency	- To build consensus with executing agency and Kecamatan (sub-district) office through discussion of the agreement with the implementation committee	- Executing Agency	- Half day meeting	Direct cost: 0.5
(1) Conclusion of agreement for the fund	- To provide one moderator for meeting	- Kecamatan Office	- One moderator	Admin. cost: 0.1
		- Implementation Committee		Program cost: 0.6
				X 180 villages 108.0
3-3 Operation of the fund	- Provision of village grant fund to the account of the implementation committee	- Implementation Committee	- Rp. 40 million (at maximum) per village	Program cost: 40.0
(1) Provision of fund				X 180 villages 7,200.0
(2) Follow-up technical guidance & support	- Provision of technical guidance by local NGO as necessary	- Implementation Committee	- Technical assistance to be made by local NGO	Program cost: 5.0
		- Beneficiaries		X 180 villages 900.0
5. Education Program				
5-1 Preparation of Materials	- To prepare pamphlet, video CD on watershed conservation and Wonogiri dam	- Implementation Committee	- Preparation and distribution of materials	Direct cost: 10.0
(1) Preparation of education materials	- To provide pamphlet and video CD	- Beneficiaries		Admin. cost: 1.0
(2) Establishment of Village Library	- To establish village library to keep the VAP, guideline or manual to be prepared by the project	- Implementation Committee	- Provision of book stands	Program cost: 11.0
		- Beneficiaries		Direct cost: 10.0
5-2 Implementation of Special Lecture & Campaign	- Provision of information on importance of watershed conservation and Wonogiri dam	- School teacher & students and members of PTA	- Provision of Seminar	Admin. cost: 1.0
(1) Special lecture to the elementary school				Program cost: 11.0
(2) Special lecture to the extension staff and local NGOs	- Provision of information on importance of watershed conservation and Wonogiri dam	- PPL and PKL	- Provision of Seminar	Direct cost: 10.0
(3) Study tour to the Wonogiri dam	- Provision of information on importance of watershed conservation and Wonogiri dam	- Local NGOs		Admin. cost: 1.0
		- Implementation Committee	- Provision of Tour	Program cost: 11.0
		- Beneficiaries		Direct cost: 10.0
(4) Campaign activities in the festival or town events	- Provision of information on importance of watershed conservation and Wonogiri dam	- Publics	- Provision of Campaign	Admin. cost: 1.0
				Admin. cost: 0.1
				1.1

1/: Estimated by the JICA Study Team

2/: Administrative cost assumed to be about 10% of program direct cost