Appendix F-32(1) Calculation of wood volume on each destination(Olt County)

						US$	1000US$	US$	1000US$
Reforestation	Species	Target	For Wood Industry		Another use	For Wood Industry		Another use	
area (ha)	Target ages	Volume m^3	%	Volume m^3	Volume m^3	Unit price	Amount	Unit price	Amount
1.60	*Populus* spp.	462		92	370		1.5		3.9
1.00	30 years	288.750	20.000	57.500	231.250	16.0		10.6	
21.30	*Robinia pseudoacacia*	4,090		426	3,664		7.0		45.4
1.00	30 years	192.019	10.416	20.000	172.019	16.5		12.4	
782.84	*Quercus* spp.	277,920		112,598	165,322		22,520.0		2,298.0
1.00	120 years	355.015	40.515	143.833	211.182	200.0		13.9	
	355m3+20m3								
1.00	140 years	375.015	43.515	163.186	211.829	200.0		13.9	
	377m3+10m3								
1.00	160 years	385.015	45.015	173.313	211.702	200.0		13.9	

Appendix F-32(2) Calculation of wood volume on each destination(Dolj County)

						US$	1000US$	US$	1000US$
Reforestation	Species	Target	For Wood Industry		Another use	For Wood Industry		Another use	
area (ha)	Target ages	Volume m^3	%	Volume m^3	Volume m^3	Unit price	Amount	Unit price	Amount
8.20	*Populus* spp.	1,504		202	1,302		3.2		13.8
1.00	30 years	183.415	13.431	24.634	158.780	16.0		10.6	
563.85	*Robinia pseudoacacia*	102,266		11,010	91,256		181.7		1,131.6
1.00	30 years	181.371	10.766	19.526	161.844	16.5		12.4	
1,936.45	*Quercus* spp.	633,284		239,222	394,062		47,844.0		5,477.0
1.00	120 years	327.033	37.775	123.536	203.497	200.0		13.9	
	$327m^3+20m^3$								
1.00	140 years	347.033	40.775	141.502	205.531	200.0		13.9	
	$347m^3+10m^3$								
1.00	160 years	357.033	42.275	150.935	206.098	200.0		13.9	

Appendix F-33 Final desired growing stock

(m^3/ha)

Species	*Quercus frainetto* planted	*Quercus cerris* planted	*Quercus robur* planted	*Quercus robur* coppices	*Robinia pseudoacacia* planted	*Robinia pseudoacacia* coppices	*Populus alba* planted
Final cutting age	120 years	120 years	120 years	100 years	30 years	30 years	30 years
Site quality							
I	530	533	888	531	428	351	527
II	451	439	749	444	333	270	400
III	374	350	609	354	239	186	289
IV	303	281	485	277	181	125	185
V	221	207	374	214	105	73	107

Reference: Tabele de productie pentru speciile

Appendix F-34 Portion of saw log for industry

(%)

Species	*Quercus frainetto* planted	*Quercus cerris* planted	*Quercus robur* planted	*Quercus robur* coppices	*Robinia pseudoacacia* planted	*Robinia pseudoacacia* coppices	*Populus alba* planted
Final cutting age	120 years	120 years	120 years	100 years	30 years	30 years	30 years
Site quality							
I	63	63	61	56	45	39	36
II	55	55	59	44	30	26	23
III	42	42	56	44	18	10	20
IV	31	31	51	28	2	2	17
V	20	20	45	22			

Reference: Tabele de sortare pentru arborete echine, pe clase de productie, pentru speciile

Appendix F-35 Estimated price of stumpage in future

(US$/m^3)

Species/ Destination	Saw log for industry	Fire wood, pulp wood
Quercus spp.	200.0	13.9
Robinia pseudoacacia	16.5	12.4
Populus alba	16.0	10.6

(US$/m^3)

		International level log price (Germany, France)		Production cost and exporting cost		Stumpage price
Quercus spp.	Saw log	300	−	100	=	200 US$
		Domestic log price		Production cost		Stumpage price
	Fire wood, pulp wood	16.1	−	2.2	=	13.9 US$

Robinia pseudoacacia		Domestic log price		Production cost		Stumpage price
	Saw log	19.0	−	2.5	=	16.5 US$
		Domestic log price		Production cost		Stumpage price
	Fire wood, pulp wood	14.9	−	2.5	=	12.4 US$

Populus alba		Domestic log price		Production cost		Stumpage price
	Saw log	18.0	−	2.0	=	16.0 US$
		Domestic log price		Production cost		Stumpage price
	Fire wood, pulp wood	12.6	−	2.0	=	10.6 US$

Note: Production cost in the stand was calculated; all of production cost divided by all of production volume on the summary table of the activities costs

Reference: Present price of stumpage in 1998

	(US$/m^3)	observation
Quercus spp.	18	Stumpage mixed all kind of use
Robinia pseudoacacia	16	Same to above
Populus alba	14	Same to above

Appendix F-36 Calculation of Quantity of Machinery

1. Agricultural Tractor, 4WD type(For Wood production work)

Productivity of operation:

Quercus stand, $57m^3$/2 tractors

$57m^3$/2 tractors×200 days= $11,400m^3$/year·2 tractors

Robinia stand, $66m^3$/2 tractors

$66m^3$/2 tractors× 200 days= $13,200m^3$/year·2 tractors

Populus stand, $96m^3$/2 tractors

$96m^3$/2 tractors×200 days= $19,200m^3$/year·2 tractors

DOLJ County; Volume of Wood production:

Quercus stand, $285,251m^3$÷ 7years=$40,750m^3$/year

$40,750m^3$/year ÷ $11,400m^3$/year·2 tractors = 7.15 tractors

Robinia stand, $47,844m^3$÷ 7years=$6,841m^3$/year

$6,841m^3$/year÷ $13,200m^3$/year·2 tractors = 1.04 tractors

Populus stand, $2,499m^3$÷ 7years=$357m^3$/year

$357m^3$/year÷ $19,200m^3$/year·2 tractors = 0.04 tractors

Total: 8.23 tractors ≒ 8 tractors

OLT County; Volume of Wood production:

Quercus stand, $145,096m^3$÷ 7years=$20,728m^3$/year

$20,728m^3$/year÷ $11,400m^3$/year·2 tractors =3.64 tractors

Robinia stand, $1,413m^3$÷ 7years=$202m^3$/year

$202m^3$/year÷ $13,200m^3$/year·2 tractors = 0.03 tractors

Populus stand, $80m^3$÷ 7years=$11m^3$/year

$11m^3$/year÷ $19,200m^3$/year·2 tractors = 0.001 tractors

Total: 3.67 tractors ≒ 4 tractors

Total: 12 tractors, 52,000 US$/tractor (Inclusive attachment)

Attachment: Skidder, Grab for yarding

Maximum productivity by year:

$57m^3$/2 tractors×260 days= $14,820m^3$/year·2 tractors

$14,820m^3$/year·2 tractors×6 sets = 88,920/year

2. Chain saw (For Wood production work)

Productivity of operation:

Quercus stand, $57m^3$/ 9 saws

$6.33m^3$/saw×200days= $1,266m^3$/year

Robinia stand, $66m^3$/12 saws

5.50m³/saw×200days= 1,100m³/year

Populus stand, 96m³/11saws

8.73m³/saw×200days= 1,746m³/year

DOLJ County; Volume of Wood production:

Quercus stand, 285,251m³÷ 7years= 40,750m³/year

40,750m³/year÷ 1,266m³/year= 32.19 saws

Robinia stand, 47,844m³÷ 7years= 6,841m³/year

6,841m³/year÷ 1,100m³/year= 6.22 saws

Populus stand, 2,499m³÷ 7years=357m³/year

357m³/year÷ 1,746m³/year= 0.20 saws

Total: 38.61 saws ≒ 39saws

OLT County; Volume of Wood production:

Quercus stand, 145,096m³÷ 7years= 20,728m³/year

20,728m³/year÷ 1,266m³/year= 16.37 saws

Robinia stand, 1,413m³÷ 7years = 202m³/year

202m³/year÷ 1,100m³/year= 0.18 saws

Populus stand, 80m³÷ 7years = 11m³/year

11m³/year÷ 1,746m³/year= 0.006 saws

Total: 16.56 saws ≒ 17 saws

Total: 56 saws× 2 times of procurement (depreciation 4 years) = 112 saws

608 US$/saw

Maximum productivity by year: 6.33m³/saw×260days= 1,646m³/year

1,646m³/year× 56 saws = 92,165m³/year

3. Mini Bach-hoe (For reforestation work)

Soil preparation at cut-over area of group-cutting,

Productivity of operation: 6.67 days/Hoe/ha

(Operation area : 50% of the actual regeneration area)

DOLJ County: Actual regeneration area 1,136.57 ha

1136.57 ha÷7years=162.37 ha/year

162.37 ha/year×6.67days/ha=1,082.99 days

1,082.99 days÷ 160days/year= 6.77 Hoes ≒ 7 Hoes

OLT County: Actual regeneration area 437.50 ha

437.50 ha÷ 7years=62.50 ha/year

62.50 ha/year×6.67days/ha=416.88 days

416.88 days÷ 160days/year= 2.61 Hoes ≒ 3 Hoes

Total: 10 Mini Backhoes 47,500 US$/Hoe

Maximum productivity by year: 260days/year ÷ 6.67days/ha = 38.98ha

38.98ha× 10 hoes = 389.8ha

4. Cultivator (For reforestation work)

Weeding by scarifying between planted line

Productivity of operation:

At the Clear cut-over area: 2.11days/ha/cultivator, Using 60 cm wide type.

At the Group cut-over area: 2.08days/ha/cultivator, Using 30 cm wide type.

DOLJ County; Actual regeneration area:

(1) At the Clear cut-over area: Using 60 cm wide type.

Quercus stand 795.58 ha÷ 7years=113.65 ha/year

113.65 ha/year×2.11days/ha=239.81days

239.81days÷40days/year=6.00Culti.s

6.00Culti.s×6years (Repeating) =35.97Culti.s ≒ 36 Cultivators

Robinia stand 406.90 ha÷ 7years= 58.10 ha/year

58.10 ha/year×2.11days/ha=122.65days

122.65days÷40days/year= 3.07Culti.s

3.07Culti.s×2years (Repeating) =6.13Culti.s ≒ 6 Cultivators

Populus stand 8.20 ha÷ 1year = 8.20 ha/year

8.20 ha/year×2.11days/ha=17.30days

17.30days÷40days/year= 0.43Culti.s

0.43Culti.s×3years (Repeating) =1.30Culti.s ≒ 1 Cultivator

Total: 43 Cultivators 737 US$/Cultivator

(2) At the Group cut-over area: Using 30 cm wide type.

Quercus stand 1,136.57 ha÷ 7years=162.37 ha/year

162.37 ha/year×2.08days/ha=337.73days

337.73days÷40days/year= 8.44Culti.s

8.44Culti.s×6years (Repeating) =50.66Culti.s≒ 51 Cultivators

567 US$/Cultivator

Total for DOLJ 94 Cultivators

OLT County; Actual regeneration area:

(1) At the Clear cut-over area: Using 60 cm wide type.

Quercus stand 343.44 ha÷ 7years=49.06 ha/year

49.06 ha/year×2.11days/ha=103.52days

103.52days÷40days/year= 2.59Culti.s

2.59Culti.s×6years(Repeating)＝15.53Culti.s≒ 16 Cultivators

Robinia stand 11.70 ha÷ 7years＝1.67 ha/year

1.67 ha/year×2.11days/ha＝3.53days

3.53days÷40days/year＝ 0.09Culti.s

0.09Culti.s×2years(Repeating)＝0.18Culti.s≒ 0 Cultivator

Populus stand 1.60 ha÷ 1years＝1.60 ha/year

1.60 ha/year×2.11days/ha＝3.38days

3.38days÷40days/year＝ 0.08Culti.s

0.08Culti.s×3years(Repeating)＝0.25Culti.s≒ 1 Cultivator

Total: 17 Cultivators 737 US$/Cultivator

(2) At the Group cut-over area: Using 30 cm wide type.

Quercus stand 437.50 ha÷ 7years＝62.50 ha/year

62.50 ha/year×2.08days/ha＝130.00days

130.00days÷40days/year＝ 3.25Culti.s

3.25Culti.s×6years(Repeating)＝19.50Culti.s≒ 20 Cultivators

567 US$/Cultivators

Total for OLT 37 Cultivators

Total for 2 counties 131 Cultivators

5. Agricultural tractor, 4WD type (For drainage & infiltration work)

Establish lineal canal by 12.5 m of distance. 800 m/ha.

Tractor of 4WD type with Disc plough or Carried plough.

Velocity of operation: 2,000 m/hour, 1,000 m/hour on both ways

Productivity of operation:

7.5 ha/day. (1,000 m/hour×6hours/day÷800 m/ha)

DOLJ County; Remaining area of damaged forest 3,383.10 ha

Prevention forest 2,491.70 ha

Total 5,874.80 ha÷ 4years＝1,468.70 ha/year

1,468.70 ha/year÷7.5 ha/day＝195.83days

195.83days÷ 200days/year＝ 0.98 tractors ≒ 1 tractor

OLT County; Remaining area of damaged forest 1.948,10 ha

Prevention forest 1.773,90 ha

Total 3,722.00 ha÷ 4years＝930.50 ha/year

930.50 ha/year÷7.5 ha/day＝124.07days

124.07days÷ 200days/year＝ 0.62 tractors ≒ 1

Total for 2 counties; 2 tractors, 53,000 US$/tractor(Inclusive attachments)

Appendix F-37 Benefits of forest functions other than wood production

All of forest area (US$ 1000)

Sector	Forest By-products			Hunting			Apiculture			Total
	OLT	DOLJ	Total	OLT	DOLJ	Total	OLT	DOLJ	Total	
RNP	251.6	68.2	319.8	169.5	181.8	351.3	31.2	4.5	35.7	706.8
Private	0	0	0	12.3	16.7	29	27.4	228.0	255.4	284.4
Total	251.6	68.2	319.8	181.8	198.5	380.3	58.6	232.5	291.1	991.2

Target forest area (Damaged forest & prevention forest) (US$ 1000)

Sector	Forest By-products			Hunting			Apiculture			Total
	OLT	DOLJ	Total	OLT	DOLJ	Total	OLT	DOLJ	Total	
RNP	24.1	8.7	32.8	16.2	23.1	39.4	3.0	0.6	3.6	75.7
Private	0.0	0.0	0.0	1.2	2.1	3.3	2.6	29.0	31.6	34.9
Total	24.1	8.7	32.8	17.4	25.2	42.7	5.6	29.6	35.2	110.6
Portion	9.585%	12.714%	11.425%	9.585%	12.714%		9.585%	12.714%		

			OLT	DOLJ	Total
All forest area	ha		48,400.0	69,100.0	117,500.0
Target forest area					
Damaged forest	ha		2,865.4	6,293.7	9,159.1
Prevention forest	ha		1,773.9	2,491.7	4,265.6
Total	ha		4,639.3	8,785.4	13,424.7
Portion			0.09585	0.12714	0.11425

Appendix F-38 Calculation of Soil Conservation Effect

1. Volume of sediment in discharge

Target forest stand area = 201.4 ha

Volume of sediment in discharge per ha/year = 87.1 ton

All of sediment volume = 201.4 ha × 87.1 ton = 17,541.94 ton

17,541.94 ton / 1.8 = 9,745.5 m^3

Specific gravity of soil : 1.8 ton/m^3

2. Establishment of the condition

The area of target forest stand shall be formed a rectangle of 1,000m wide by 2,000m length.

The inclination angle of stand shall be 12°.

The sediment shall be stop at the edge of low side, 1,000m wide.

The sediment shall be stable by the grade of 6°(1/2 of the initial angle)

3. Efficient height of sediment retaining wall

Retaining height	Retaining length	Volume of retaining sediment
1.0 m	9.31 m	1.0× 9.31×1/2×1,000 = 4,655 m^3
1.5 m	13.96 m	1.5×13.96×1/2×1,000 = 10,470 m^3
2.0 m	18.61 m	2.0×18.61×1/2×1,000 = 18,610 m^3

It shall be decided the height of retaining wall by enough coefficient of safety

The coefficient of safety = 18,610m^3/9,745.5m^3 = 1.91

Therefore 2.0 m of height is decided for the efficient height

4. The structure of the sediment retaining wall

Height of wall	3.0 m (upper ground: 2.0 m, under ground 1.0 m)
Thickness of top of wall	0.3 m
Gradient of down stream side	0.3
Gradient of up stream side	0.05

5. Volume of the concrete for the wall construction

Basal area	(0.3m+1.35m)/2×3.0m = 2.47 m^2
Volume	2.47 m^2×1,000m = 2,470 m^3

6. Cost of work per 1m^3 of the wall

2,470m3×50,000JP YEN/m^3 = 123,500,000JP YEN

Cost of materials = 44,000JP YEN 44,000JP YEN×0.596= 26,222JP YEN

Cost of lobar = 6,000JP YEN 6,000×0.0289= 173JP YEN

Total = 26,395JP YEN 26,395JP YEN / 120= 219.96 US$/$m^3$

2,470m3×219.96US$/$m^3$ = 543,312US$

7. Cost of work per 1m^3 of sediment

543,312 US$/9,745.5$m^3$ = 55.75 US$/$m^3$

Note: Comparison of work cost (US$)

		Japan	Romania	Ratio	Japan(A)	Romania(B	B/A
Cement	US$/kg	0.14	0.16	235 kg			
Gravel	US$/m3	32.99	6.90	1.41 m^3			
Total materials					79.411	47.329	59.60%
Wages	US$/day	145.83	4.21				2.89%

Appendix F-39 Plantation Area by Operation Year, Forest Management Type, Damage Grade

<Olt County> (ha)

Forest Management Type	Damage Grade	Operation Year							Total
		4	5	6	7	8	9	10	
F1	Strong								
F2	Strong								
	Moderate								
F3	Moderate								
F5	Strong	6.00	7.00	6.50	10.00	26.00	47.00	40.22	142.72
	Moderate	2.00	2.00	2.00	4.50	67.00	80.00	53.35	210.85
F6	Strong	4.00	4.00	4.00	6.00	21.00	23.00	18.48	80.48
	Moderate	3.00	3.00	3.00	4.00	38.00	67.00	60.55	178.55
F7	Strong	1.00	5.00	7.00	7.80				20.80
	Moderate	1.00	3.00	9.00	3.45	6.00			22.45
F8	Strong	7.00	17.00	27.00	41.00	7.44			99.44
	Moderate	3.00	4.00	12.00	6.65				25.65
F9	Strong				3.80				3.80
	Moderate		1.00	1.00	1.50				3.50
F10	Strong		1.00	2.00	3.00				6.00
	Moderate	1.00	2.00	3.00	2.00				8.00
F11	Strong			1.90					1.90
	Moderate								
F12	Strong								
F13	Strong								
	Moderate					1.60			1.60
Total	Strong	18.00	34.00	48.40	71.60	54.44	70.00	58.70	355.14
	Moderate	10.00	15.00	30.00	22.10	112.60	147.00	113.90	450.60
	Total	28.00	49.00	78.40	93.70	167.04	217.00	172.60	805.74

<Dolj County> (ha)

Forest Management Type	Damage Grade	Operation Year							Total
		4	5	6	7	8	9	10	
F1	Strong					19.68			19.68
F2	Strong					27.12			27.12
	Moderate						6.08		6.08
F3	Moderate		1.44						1.44
F5	Strong	14.00	14.00	14.00	20.00	54.00	98.00	84.32	298.32
	Moderate	3.00	3.00	3.00	5.50	83.00	100.00	65.40	262.90
F6	Strong	16.00	16.00	16.00	24.00	89.00	97.00	80.08	338.08
	Moderate	13.00	13.00	12.00	16.00	162.00	283.00	258.80	757.80
F7	Strong	4.00	10.00	18.00	16.72				48.72
	Moderate	4.00	7.00	26.00	11.20	19.00			67.20
F8	Strong	3.00	8.00	13.00	19.00	3.56			46.56
	Moderate	5.00	6.00	18.00	12.15				41.15
F9	Strong	20.00	35.00	60.00	115.10				230.10
	Moderate	10.00	19.00	44.00	54.60				127.60
F10	Strong	10.00	24.00	58.00	82.30				174.30
	Moderate	4.00	8.00	13.00	6.85				31.85
F11	Strong								
	Moderate			1.80					1.80
F12	Strong			2.50					2.50
F13	Strong				17.10				17.10
	Moderate					8.20			8.20
Total	Strong	67.00	107.00	181.50	294.22	193.36	195.00	164.40	1,202.48
	Moderate	39.00	57.44	117.80	106.30	272.20	389.08	324.20	1,306.02
	Total	106.00	164.44	299.30	400.52	465.56	584.08	488.60	2,508.50

Appendix F-40(1) Required Number of Nursery Stock by Species and Operation Year

<Olt County for Damaged Forest>

(Planting Stock Number)

Tree Species	Operation Year								Total
	4	5	6	7	8	9	10	11	
Q. frainetto	28,970	37,431	37,644	58,219	401,793	605,095	495,259	77,979	1,742,390
Q.cerris	17,585	24,903	35,784	36,206	161,028	269,381	258,793	42,224	845,903
Q.robur	19,685	50,442	104,011	108,578	42,850	4,984			330,550
Q.petraea	3,800	9,544	19,575	20,787	7,929	897			62,534
Q.pedunculiflora	3,459	8,184	16,508	18,467	6,327	647			53,592
Fraxinus excelsior	6,234	12,401	24,403	27,412	3,968				74,418
Tilia platyphyllos	3,459	7,493	15,010	15,465	3,234				44,660
Pyrus pyraster	2,317	2,317	2,317	3,267	21,435	34,053	30,160		95,866
Robinia pseudoacacia	1,000	9,150	17,500	40,250	13,860				81,760
Gladitschia triacanthos		500	1,000	3,400					4,900
Elaeagnus angustifolia		250	500	1,700					2,450
Populus spp.					1,000	200			1,200
Assistant Trees	42,741	68,985	116,009	125,122	303,782	399,511	315,501		1,371,651
Total	129,250	231,600	390,261	458,872	967,207	1,314,768	1,099,712	120,203	4,711,873

Remark : The Above table does not include data of Forest Mantle Replantation.

Remark : Inclusive for replantation

<Dolj County for Damaged Forest>

(Planting Stock Number)

Tree Species	Operation Year								Total
	4	5	6	7	8	9	10	11	
Q. frainetto	69,208	83,049	84,299	116,486	797,450	1,126,119	949,947	151,160	3,377,718
Q.cerris	73,257	94,809	120,508	130,624	755,579	1,171,033	1,109,256	180,879	3,635,946
Q.robur	30,820	62,836	159,982	195,946	85,494	10,450			545,528
Q.petraea	5,617	13,141	29,006	24,577	12,718	1,773			86,833
Q.pedunculiflora	4,250	11,276	20,870	18,450	7,847	982			63,676
Fraxinus excelsior	5,767	9,268	21,935	31,662	1,899				70,531
Tilia platyphyllos	4,250	7,426	18,785	18,494	4,908				53,863
Pyrus pyraster	9,684	9,684	9,268	13,068	102,543	146,330	129,199		419,776
Robinia pseudoacacia	156,500	368,850	747,000	1,232,100	392,920				2,897,370
Gladitschia triacanthos	15,000	29,500	59,000	98,700					202,200
Elaeagnus angustifolia	7,500	14,750	29,500	49,350					101,100
Populus spp.					5,125	1,025			6,150
Assistant Trees	101,396	127,391	209,418	237,686	842,761	1,070,389	894,454		3,483,493
Total	483,250	831,981	1,509,571	2,167,142	3,009,243	3,528,101	3,082,856	332,039	14,944,184

Remark :The Above table does not include data of Forest Mantle Replantation.

Remark : Inclusive for replantation

<Total>

(Planting Stock Number)

Tree Species	Operation Year								Total
	4	5	6	7	8	9	10	11	
Q. frainetto	98,177	120,480	121,943	174,705	1,199,242	1,731,215	1,445,206	229,140	5,120,107
Q.cerris	90,842	119,712	156,292	166,830	916,607	1,440,414	1,368,049	223,103	4,481,849
Q.robur	50,505	113,279	263,993	304,524	128,344	15,435			876,078
Q.petruea	9,418	22,686	48,581	45,364	20,647	2,670			149,366
Q.pedunculiflora	7,709	19,460	37,379	36,917	14,174	1,628			117,268
Quercus spp.	256,652	395,616	628,187	728,340	2,279,015	3,191,362	2,813,255	452,242	10,744,668
Fraxinus excelsior	12,001	21,669	46,338	59,073	5,867				144,949
Tilia platyphyllos	7,709	14,919	33,795	33,959	8,142				98,524
Pyrus pyraster	12,001	12,001	11,585	16,335	123,978	180,383	159,359		515,641
Robinia pseudoacacia	157,500	378,000	764,500	1,272,350	406,780				2,979,130
Gladitschia triacanthos	15,000	30,000	60,000	102,100					207,100
Elaeagnus angustifolia	7,500	15,000	30,000	51,050					103,550
Populus spp.					6,125	1,225			7,350
Assistant Trees	144,137	196,376	325,427	362,808	1,146,542	1,469,900	1,209,955		4,855,144
Total	612,500	1,063,581	1,899,832	2,626,014	3,976,450	4,842,869	4,182,569	452,242	19,656,057

Note: Assistant trees: *Acer tataricum* , *Acer campestre* , *Prunus cerasifera* , *Fraxinus ornus* , *Crataegus monogyna* , *Cornus sanguinea* , *Ligustrum vulgare* , *Rosa canina* , etc.

Remark :The Above table does not include data of Forest Mantle Replantation.

Remark : Inclusive for replantation

<Nursery Stock for Forest Mantle of Damaged Forest>

(Planting Stock Number)

Species	Operation Year				Total
	5	6	7	8	
Robinia pseudoacacia	30,000	45,500	31,150	7,100	113,750
Gladitschia triacanthos	30,000	45,500	31,150	7,100	113,750
Elaeagnus angustifolia	30,000	45,500	31,150	7,100	113,750
Crataegus monogyna	30,000	45,500	31,150	7100	113,750

Remark : Inclusive for replantation

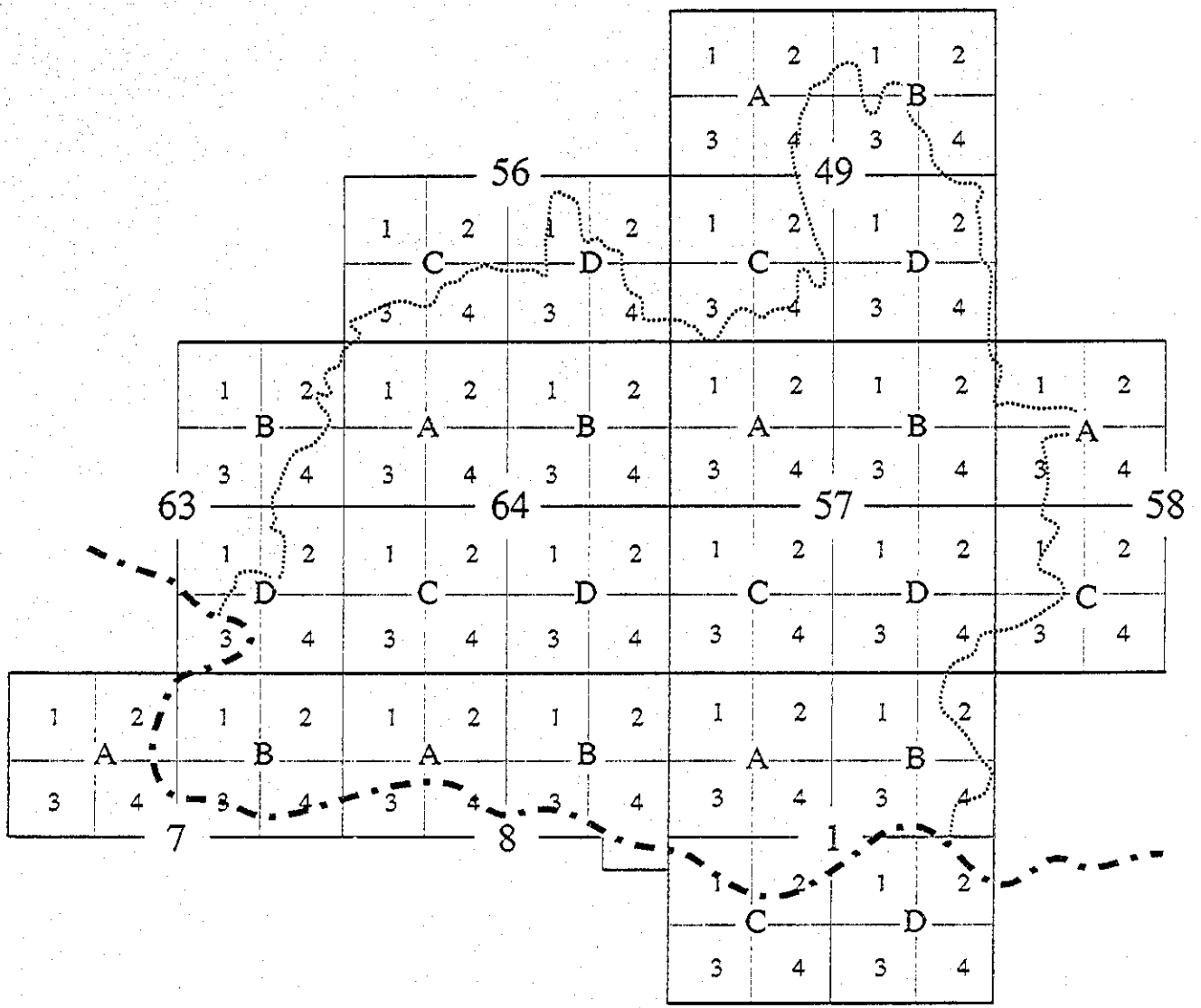
<Nursery Stock for Forest Mantle of Prevention Forest>

(Planting Stock Number)

Species	Operation Year		Total
	5	6	
Robinia pseudoacacia	23,000	9,200	32,200
Gladitschia triacanthos	23,000	9,200	32,200
Elaeagnus angustifolia	23,000	9,200	32,200
Crataegus monogyna	23,000	9,200	32,200

Remark : Inclusive for replantation

Appendix.F-41 Index Sheet for Thematic Map



Survey Conduction Preparedness

Survey Conduction Preparedness

(1) Member of the Study Team

1) First Field Survey (Explanation and discussion of IC/R, Collection of data and information, General survey)

Survey Field	Person in Charge	Work Period			
Conservation	Dr. Keiji Takeshita	20-Sep-97	~	04-Oct-97	15 days
Financial and Economic Analyses	Mr. Tadayoshi Komiya	21-Sep-97	~	10-Oct-97	20 days
Socioeconomy	Ms. Yumiko Abe	27-Sep-97	~	16-Oct-97	20 days
Forest Ecology and Environment	Dr. Juemon Itoh	21-Sep-97	~	10-Oct-97	20 days
Reforestation / Nursing	Mr. Kozo Yamagaki	21-Sep-97	~	10-Oct-97	20 days
Forest Diseases and Harmful Insects	Mr. Nobuo Enda	21-Sep-97	~	10-Oct-97	20 days
Soil	Mr. Hiroshi Takatoh	27-Sep-97	~	10-Oct-97	14 days
Climate/Forest Hydrology	Mr. Hisashi Fukuda	27-Sep-97	~	16-Oct-97	20 days
Forest Survey	Mr. Susumu Kamataki	27-Sep-97	~	10-Oct-97	14 days
Forest Management	Mr. Akihito Sakurai	20-Sep-97	~	09-Oct-97	20 days
Satellite Image Analysis / Supervisions of Aerial Photography	Mr. Hideto Hosoda	21-Sep-97	~	10-Oct-97	20 days
Work Coordination	Mr. Takeshi Yamazaki	20-Sep-97	~	16-Oct-97	27 days

2) Second Field Survey (Explanation and discussion of PR/R)

Survey Field	Person in Charge	Work Period			
Financial and Economic Analysis	Mr. Tadayoshi Komiya	01-Mar-98	~	10-Mar-98	10 days
Forest Ecology and Environment	Dr. Juemon Itoh	01-Mar-98	~	10-Mar-98	10 days
Soil	Mr. Hiroshi Takatoh	01-Mar-98	~	10-Mar-98	10 days

3) Third Field Survey (Field survey)

Survey Field	Person in Charge	Work Period			
Conservation	Dr. Keiji Takeshita	06-Jun-98	~	10-July-98	35 days
Financial and Economic Analyses	Mr. Tadayoshi Komiya	29-Jun-98	~	12-Aug-98	45 days
Socioeconomy	Ms. Yumiko Abe	29-Jun-98	~	12-Aug-98	45 days
Forest Ecology and Environment	Dr. Juemon Itoh	14-Jun-98	~	12-Aug-98	60 days
Reforestation / Nursing	Mr. Kozo Yamagaki	24-May-98	~	22-June-98	30 days
		29-Sep-98	~	18-Oct-98	20 days
Forest Diseases and Harmful Insects	Mr. Nobuo Enda	24-May-98	~	12-Jul-98	50 days
Soil	Mr. Hiroshi Takatoh	14-Jun-98	~	23-Aug-98	71 days
Climate/Forest Hydrology	Mr. Hisashi Fukuda	24-May-98	~	22-Jul-98	60 days
Forest Survey	Mr. Susumu Kamataki	28-Jun-98	~	06-Sep-98	71 days
Forest Management	Mr. Akihito Sakurai	06-Jun-98	~	09-Aug-98	65 days
Satellite Image Analysis / Supervisions of Aerial Photography	Mr. Hideto Hosoda	30-May-98	~	18-Jul-98	50 days
		16-Sep-98	~	14-Oct-98	19 days
Work Coordination	Mr. Kiyohito Hayakawa	09-May-98	~	07-Jun-98	30 days

4) Fourth Field Survey (Explanation and discussion of IT/R)

Survey Field	Person in Charge	Work Period			
Conservation	Dr. Keiji Takeshita	21-Feb-99	~	28-Feb-99	8 days
Financial and Economic Analysis	Mr. Tadayoshi Komiya	21-Feb-99	~	28-Feb-99	8 days
Forest Ecology and Environment	Dr. Juemon Itoh	21-Feb-99	~	28-Feb-99	8 days

5) Fifth Field Survey (Field survey)

Survey Field	Person in Charge	Work Period			
Conservation	Dr. Keiji Takeshita	03-Jun-99	~	27-Jul-99	25 days
Financial and Economic Analyses	Mr. Tadayoshi Komiya	31-May-99	~	27-Jul-99	28 days
Forest Ecology and Environment	Dr. Juemon Itoh	31-May-99	~	27-Jul-99	28 days
Reforestation / Nursing	Mr. Kozo Yamagaki	31-May-99	~	27-Jul-99	28 days
Climate/Forest Hydrology	Mr. Hisashi Fukuda	27-May-99	~	27-Jul-99	32 days
Forest Survey	Mr. Susumu Kamataki	18-May-99	~	27-Jul-99	41 days
Forest Management	Mr. Akihito Sakurai	31-May-99	~	27-Jul-99	28 days

6) Sixth Field Survey (Explanation and discussion of DF/R)

Survey Field	Person in Charge	Work Period			
Conservation	Dr. Keiji Takeshita	31-Oct-99	~	7-Nov-99	8 days
Financial and Economic Analysis	Mr. Tadayoshi Komiya	31-Oct-99	~	7-Nov-99	8 days
Forest Management	Mr. Akihito Sakurai	31-Oct-99	~	7-Nov-99	8 days

(2) Member of JICA Advisory Team

1) First Field Survey (Explanation and discussion of IC/R)

Survey Field	Person in Charge	Work Period			
Reforestation	Mr. Takeo Mizoguchi	21-Sep-97	~	03-Oct-97	13 days
Coordination	Mr. Yasunori Nakayama	21-Sep-97	~	03-Oct-97	13 days

2) Second Field Survey (Explanation and discussion of PR/R)

Survey Field	Person in Charge	Work Period			
Reforestation	Mr. Takeo Mizoguchi	01-Mar-98	~	09-Mar-98	9 days
Coordination	Mr. Yukihide Katsuta	01-Mar-98	~	09-Mar-98	9 days

3) Fourth Field Survey (Explanation and discussion of IT/R)

Survey Field	Person in Charge	Work Period			
Coordination	Mr. Yasunori Nakayama	21-Feb-99	~	28-Feb-99	8 days

4) Sixth Field Survey (Explanation and discussion of DF/R)

Survey Field	Person in Charge	Work Period			
Leader	Mr. Motofumi Kohara	31-Oct-99	~	7-Nov-99	8 days
Forest Ecology / Forest Protection	Dr. Takefumi Ikeda	31-Oct-99	~	7-Nov-99	8 days
Coordination	Ms. Sayako Tokuda	31-Oct-99	~	7-Nov-99	8 days

(3) Member of Counterpart Personnel

Survey Field	Name	Assignment	Member of Study Team
Forest Conservation	Mr. Ovidiu Badea	ICAS	Keiji Takeshita
Financial and Economic Analysis	Mrs. Dragoi Simona	ICAS	Tadayoshi Komiya
Socioeconomic	Mrs. Dragoi Simona Mr. Viorel Blujdea	ICAS ICAS	Yumiko Abe
Forest Ecology and Environment	Mr. Iovu Adrian Biris Mr. Laurentiu Popovici	ICAS ICAS	Juemon Itoh
Reforestation and Nursing	Mr. Laurentiu Popovici Mr. Simion Dan-Robert	ICAS Forest Branch Targoviste	Kozo Yamagaki
Forest Disease and Harmful Insect	Mr. Netoiu Constantin Mr. Dragos Mihai	ICAS Craiova RNP	Nobuo Enda
Soil	Dr. Nicolae Geambasu Dr. Constantin Rosu Mr. Florin Donescu	ICAS ICAS ICAS	Hiroshi Takato
Forest Climate and Hydrology	Dr. Constantin Rosu Mr. Ilie Cojocaru Mr. Netoiu Constantin	ICAS Forest Branch Craiova ICAS Craiova	Hisashi Fukuda
Forest Survey	Mr. Gheorghe Marin Mr. Vladimir Gancz	ICAS ICAS	Susumu Kamataki
Forest Management	Mr. Gheorghe Marin	ICAS	Akihito Sakurai

Minutes of Meeting

- Scope of Work for The Feasibility Study on Forests Restoration in Romanian Plain
- Minutes of Meeting on Scope of Work for The Feasibility Study on Forests Restoration in Romanian Plain
- Minutes of Meeting on Inception Report for The Feasibility Study on Forests Restoration in Romanian Plain
- Minutes of Meeting on Progress Report for The Feasibility Study on Forests Restoration in Romanian Plain
- Minutes of Meeting on Interim Report for The Feasibility Study on Forests Restoration in Romanian Plain
- Minutes of Meeting on Draft Final Report for The Feasibility Study on Forests Restoration in Romanian Plain

SCOPE OF WORK

FOR

THE FEASIBILITY STUDY ON FORESTS RESTORATION
IN ROMANIAN PLAIN

AGREED UPON BETWEEN

MINISTRY OF WATERS, FORESTS AND ENVIRONMENT PROTECTION

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

Bucharest, April 16, 1997

Mr. Ioan SECELEANU
Secretary of State
Ministry of Waters, Forests and
Environment Protection
Romania

H. Kanazawa

Mr. Hiroyuki KANAZAWA
Team Leader
The Preparatory Study Team
Japan International Cooperation Agency
Japan

I. INTRODUCTION

In response to the request of the Government of Romania, the Government of Japan has decided to conduct a Feasibility Study on Forests Restoration in Romanian Plain (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Romania.

The present document sets forth the scope of work with regard to the Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

(1) to elaborate a forest restoration plan which proposes the possible countermeasures for establishment of stable forests to prevent the environment from further degradation, and,
(2) to transfer technology to the counterpart personnel through the implementation of the Study.

III. SCOPE OF THE STUDY

1. Study Area

The Study Areas are Dolj and Olt counties (see Appendix 1)

2. Outline of the Study

In order to achieve the objectives mentioned above, the Study will be conducted in the Study Area as follows:

(1) Collection and analysis of existing data on natural and social conditions

- Natural conditions
- Socio-economic conditions

(2) Aerial photography

(3) Photo interpretation
- Defoliation type and degree
- Tree species
- Crown density
- Stand height
- Others

(4) Ground surveys
- Topography
- Vegetation
- Biometric parameters
- Soil
- Climate/Hydrology
- Type and degree of decline
- Others

(5) Socio-economic surveys

(6) Preparation of the following thematic maps
- Vegetation maps
- Forest damage classification map

(7) Preparation of the forest restoration plan including the following components
- Suitable tree species
- Propagation
- Silvicultural tending
- Infrastructure
- Organization/Management
- Machinery/Equipment

(8) Assessments of the feasibility of the forest restoration plan
- Cost estimation
- Financial and economic analysis

(9) Preparation of the forest restoration planning maps

IV. STUDY SCHEDULE

The Study shall be carried out in accordance with the attached tentative study schedule (see Appendix 2).

V. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Romania.

1. Inception Report
   Twenty (20) copies at the commencement of the Study

2. Progress Report (I)
   Twenty (20) copies at the beginning of the Study

3. Interim Report
   Twenty (20) copies at the middle of the Study

4. Draft Final Report
   Twenty (20) copies at the later of the Study. The Government of Romania will provide JICA with its comments on the Draft Final Report within one (1) month after receipt of the Draft Final Report.

5. Final Report
   Fifty (50) copies within two (2) months after receipt of the comments of the Government of Romania on the Draft Final Report.

In addition to the above reports, the following are to be submitted to the Government of Romania with relevant reports.

1) Aerial photography in the Study Area (1set):
   - Original films
   - Contact prints

2) Maps in the Study Areas (First original 1set, Second original 1set)
   - Vegetation maps
   - Forest damage classification maps
   - Forest restoration planning maps

VI. UNDERTAKING OF THE GOVERNMENT OF ROMANIA

1. To facilitate the smooth conduct of the Study, the Government of Romania shall take necessary measures:
   (1) to secure the safety of the Japanese study team;

(2) to permit the members of the Japanese study team to enter, leave and sojourn in Romania for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees;
(3) to exempt the members of the Japanese study team from taxes, duties and other charges on equipment, machinery and other materials brought into Romania for the conduct of the Study;
(4) to exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the Study;
(5) to provide necessary facilities to the Japanese study team for remittance as well as utilization of the funds introduced into Romania from Japan in connection with the implementation of the Study;
(6) to secure permission for entry into private properties or restricted areas for the conduct of the Study;
(7) to secure permission for the Japanese study team to take all data and documents (including maps and photographs) related to the Study out of Romania to Japan; and
(8) to provide medical services as needed. Its expenses will be chargeable to members of the Japanese study team.

2. The Government of the Romania shall bear claims, if any arise against members of the Japanese study team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese study team.

3. Ministry of Waters, Forests and Environment Protection (hereinafter referred to as "MWFEP") shall act as a counterpart agency to the Japanese study team and also as a coordinating body in relations with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

4. MWFEP shall, at its own expense, provide the Japanese study team with the following, in cooperation with other organizations concerned:
(1) available data and information related to the Study,
(2) counterpart personnel,
(3) suitable office spaces with necessary equipment in Bucharest, Dolj and Olt counties, and
(4) credentials or identification cards.

VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

(1) to dispatch, at its own expense and on a grant basis, the study teams to Romania, and

(2) to pursue technology transfer to the Romanian counterpart personnel in the course of the Study.

VIII. OTHERS

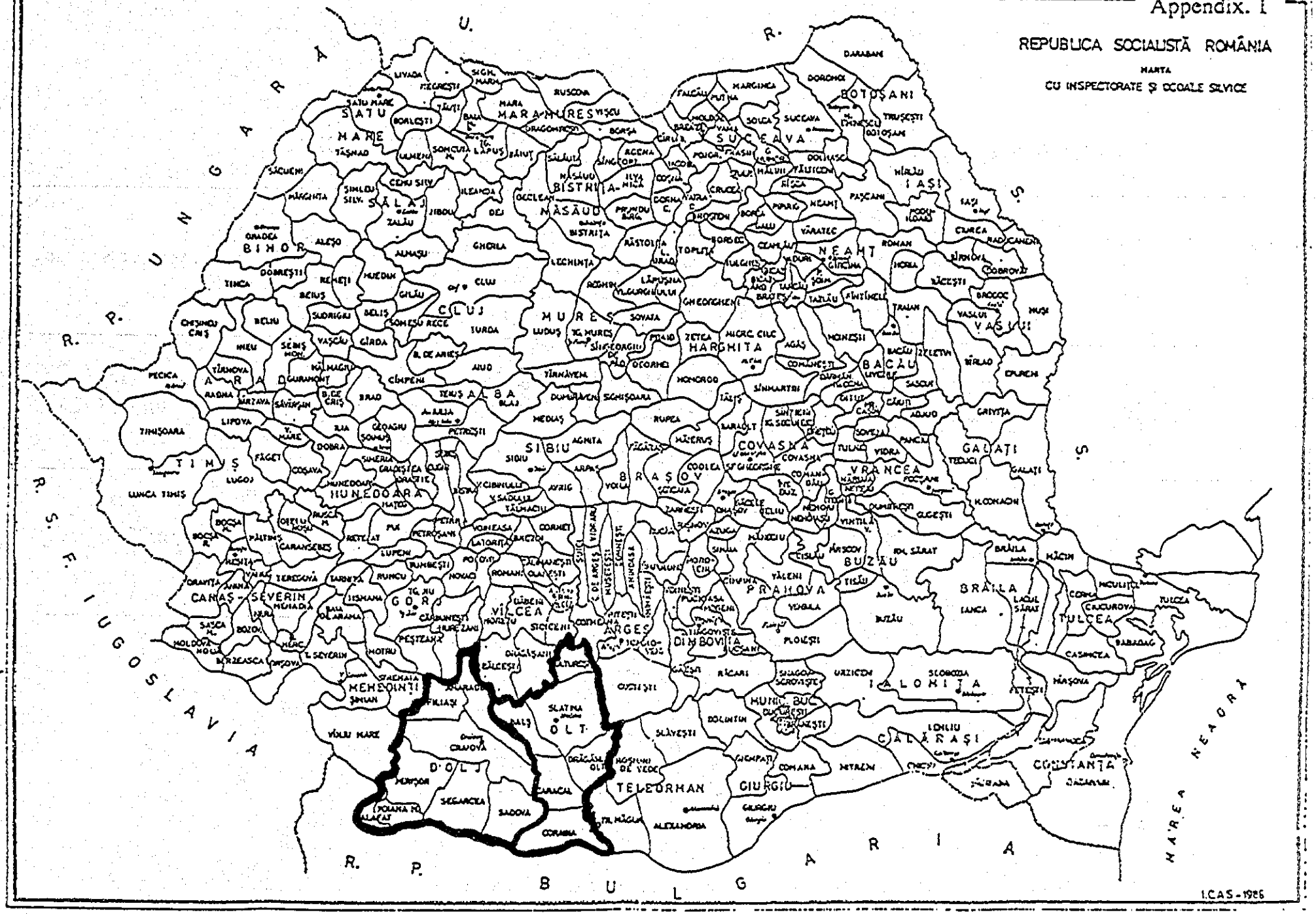
JICA and MWFEP shall consult with each other in respect of any matters that may arise from or in connection with the Study.

Appendix. I

REPUBLICA SOCIALISTĂ ROMÂNIA

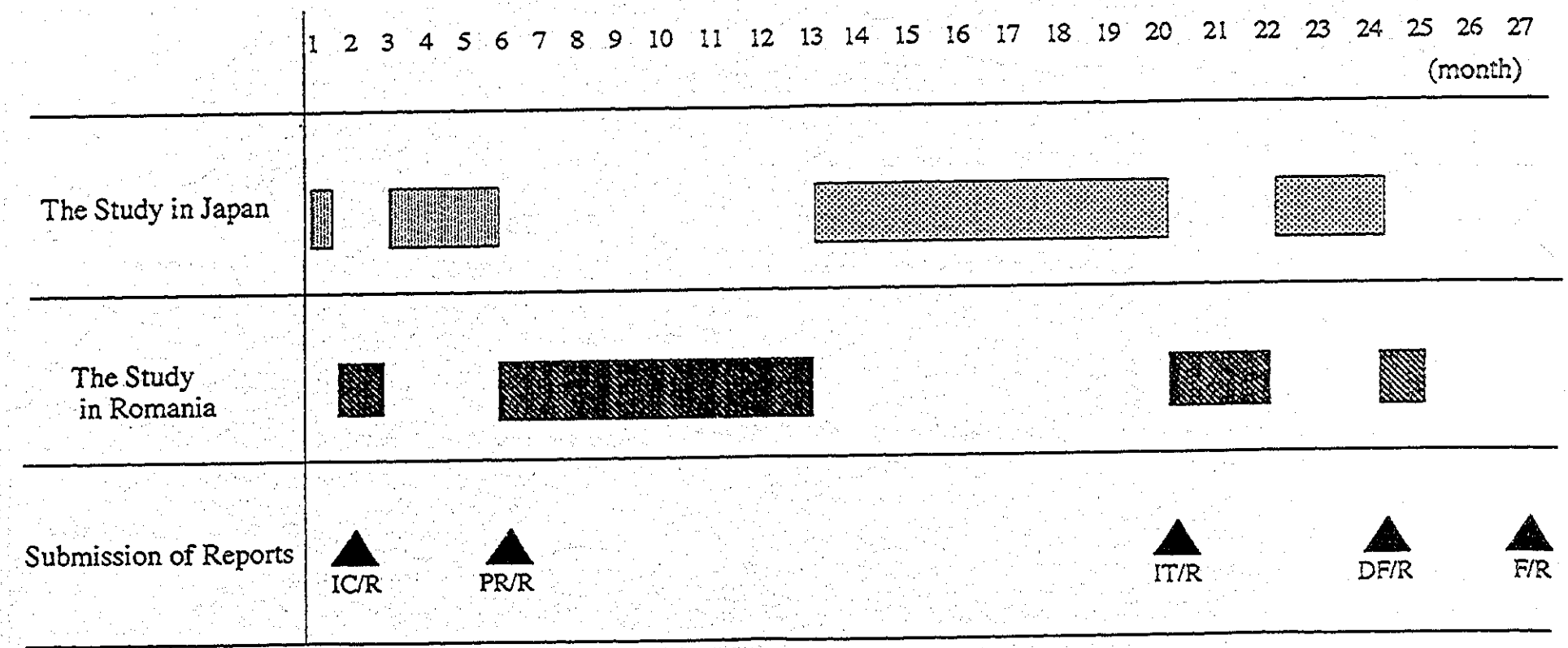
HARTA

CU INSPECTORATE ŞI OCOALE SILVICE



Appendix. 2

Tentative Study Schedule



(Remarks)

IC/R : Inception Report
PR/R : Progress Report
IT/R : Interim Report
DF/R : Draft Final Report
F/R : Final Report

MINUTES OF MEETING
ON
SCOPE OF WORK
FOR
THE FEASIBILITY STUDY
ON
FORESTS RESTORATION IN ROMANIAN PLAIN

The preparatory study team (hereinafter referred to as " the Team ") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, headed by Mr. KANAZAWA, visited Romania from April 7 to 16, 1997 for the purpose of discussing and confirming the Scope of Work for the Feasibility Study on Forests Restoration in Romanian Plain (hereinafter referred to as "the Study").

The Team had a series of discussions with the officials concerned of the Ministry of Waters, Forests and Environment Protection, (hereinafter referred to as "MWFEP") headed by Mr. I. SECELEANU on the Scope of Work of the Study.

As a result of the discussions, MWFEP and the Team agreed upon the Scope of Work for the Study.

The main issues discussed by both sides in relation to the Scope of Work for the Study are shown in the ANNEX as attached hereto.

Bucharest, April 16, 1997

Mr. Ioan SECELEANU
Secretary of State
Ministry of Waters, Forests and
Environment Protection
Romania

H. Kanazawa

Mr. Hiroyuki KANAZAWA
Team Leader
The Preparatory Study Team
Japan International Cooperation Agency
Japan

ANNEX

The following are the main issues discussed in relation to the Scope of Work for the Study:

1. Both sides confirmed that National Administration of The Forest (hereinafter referred to as "RNP") and Forest Research and Management Institute (hereinafter referred to as "ICAS") would be also act as counterpart organizations with MWFEP.

2. The Team requested that MWFEP would take necessary permissions from the authorities concerned for taking aerial photos (color infrared, scale 1/20,000) and taking them out of Romania for interpretation, and for taking topographic maps (scale 1/25,000) out of Romania for categorization of forests based on defoliation type and degree and mapping the thematic maps. MWFEP accepted this request.

3. MWFEP promised that it would provide Romanian counterpart personnel from MWFEP, RNP and ICAS during the implementation of the Study.

4. Romanian side requested that during the implementation of the Study in Japan, the Romanian counterpart personnel should be trained concerning the Study. The Team agreed the idea and explained that it is necessary to submit an official request through the diplomatic channel for the counterpart training.

5. MWFEP requested the Team that JICA would consider providing necessary equipment for the technology transfer concerning the Study. The Team promised to convey the request to the Government of Japan.

6. The Team explained that the equipment to be used by the Japanese study team would be the property of Japanese side unless further official request of donation be accepted by JICA at the time of completion of the Study.

7. Both sides agreed that the Study should include a technology transfer seminar at the stage of explanation of the Draft Final Report to disseminate the results of the Study. The seminar is to be jointly organized by the Romanian side and the Japanese study team.

8. Both sides agreed that basically final report would be publicized to the people who were interested in the Study.

LIST OF PARTICIPANTS

SUBJECT : Feasibility Study on Forests Restoration in Romanian Plain
DATE : April 7 - 16, 1997
PLACE : Bucharest, Olt County and Dolj County

1. Ministry of Waters, Forests and Environment Protection

Mr. I. Seceleanu	Secretary of State
Ms. A. Jucan	Director
Mr.C. Zaharescu	Expert

2. National Office of Cadastre Geodesy and Cartography

Dr. M. Rotaru	President
Mr. Chiriacescu	Deputy Director

3. National Administration of Forest

Mr. Gh. Cahnita	Director General
Mr. L. Contescu	Senior Engineer
Mr. N. Florica	Director, Forest Branch "Slatina"
Mr. A. Suschievici	Deputy Director, Forest Branch "Slatina"
Mr. I. Mitran	Chief of Bals Forest District, Forest Branch "Slatina"
Mr. T. Popa	Director, Forest Branch "Craiova"
Mr. I. Cojocaru	Deputy Director, Forest Branch "Craiova"
Mr. Gh. Folea	Chief of Perisor Forest District, Forest Branch "Craiova"
Ms. E. Nuta	Chief of Craiova Forest District, Forest Branch "Craiova"

4. Forest Research and Management Institute

Dr. N. Geambasu	Director
Dr. C. Rosu	Engineer, Specialist
Mr. O. Badea	Engineer, Specialist
Mr. V. Ganz	Engineer, GIS and RS unit
Mr. F. Danescu	Engineer, Soils laboratory
Ms. M. Cuceriaev	Engineer, Photogrammetry

5. Preparatory Study Team, JICA

Mr. H. Kanazawa	Leader
Mr. Y. Nakayama	Coordinator
Mr. H. Taoda	Silviculture of Broad-leaved Tree
Mr. K. Morisada	Soil
Dr. H. Sawada	Forest Aerial Photogrammetry

6. Others

Mr. S. Nishimura	Embassy of Japan
Mr. S. Shirai	Embassy of Japan
Mr. S. Fujita	Embassy of Japan

MINUTES OF MEETING
ON
INCEPTION REPORT
FOR THE FEASIBILITY STUDY
ON
FORESTS RESTORATION IN ROMANIAN PLAIN

Bucharest, September 29, 1997

Mr. Ioan SECELEANU
Secretary of State
Ministry of Waters, Forests and
Environment Protection
Romania

Dr. Keiji TAKESHITA
Leader
The Study Team for The
Feasibility Study on Forests
Restoration in Romanian Plain
Japan

Witnessed by

Mr. Takeo MIZOGUCHI
JICA Advisory Team
Japan

In accordance with the Scope of Work for The Feasibility Study on Forests Restoration in Romanian Plain (hereinafter referred to as "The Study") agreed upon between the Ministry of Waters, Forests and Environment Protection (hereinafter referred to as "MWFEP") headed by Mr. Ioan SECELEANU, Secretary of State of MWFEP, and Japan International Cooperation Agency (hereinafter referred to as "JICA"), The Study Team for The Study (hereinafter referred to as "the Study Team") headed by Dr. TAKESHITA, Leader of the Study Team, prepared and submitted the twenty copies of the Inception Report for The Study (hereinafter referred to as "the Inception Report") to Romanian side.

The meeting of the Inception Report organized by MWFEP was held on September 24 – 25, 1997 at the meeting room of National Administration of The Forest (hereinafter referred to as "RNP") with attendance of JICA Advisory Team headed by Mr. Takeo Mizoguchi. The other attendants of the meeting are as per attached.

The meeting was opened by Mr. Ioan SECELEANU, and chaired by Mr. Ovidiu BADEA, Scientific Director of Forest Research and Management Institute (hereinafter referred to as "ICAS") and Mr. Mihai DAIA, Technical Director of RNP. The Chairperson, Mr. BADEA, presented the general agenda to the participants. Upon the request by Mr. BADEA, the Study Team had a series of discussions with the officials concerned of MWFEP, RNP and ICAS on the Inception Report.

As a result of discussions, the Inception Report were basically accepted by the participants. The Chairpersons expressed their deep thanks to JICA Advisory Team and the Study Team on their efforts in starting the Study. It was confirmed that the Feasibility Study would proceed in accordance with the Inception Report.

The main issues discussed by the both sides in relation to the Inception Report are shown in the ANNEX as attached hereto.

ANNEX1

After the explanation of the Inception Report by The Study Team, Romanian side and Japanese side confirmed the following issues relating to the execution of the Study.

1. Both sides agreed to the following with regard to the contents and process of the Inception Report.

(a) The scales of the aerial photos changed from 1/20,000 to 1/25,000.

(b) The scales of the Thematic Maps will be made by 1/25,000.

(c) Romanian side would provide publication and information (including maps) relating to the forest decline in Romania to the Study Team.

(d) Romanian side would cooperate in the selection of experimental locations.

(e) Romanian side would prepare the fields for seedling propagation including cutting and grafting trials.

(f) Both sides confirmed that transfer technology would proceed with transfer technology plan (draft) submitted by the Study Team.

2. The Romanian side agreed to the following requests from the Study Team.

(a) The Romanian side would designate counterpart personnel for 10 members of the Study Team from RNP and ICAS by the end of the Study. The fields of the ten members are as follows:

- Forest Conservation
- Financial and Economic Analysis
- Socioeconomy

- Forest Ecology and Environment
- Reforestation and Nursing
- Forest Diseases and Harmful Insects
- Soil
- Climate and Forest Hydrology
- Forest Survey
- Forest Management

(b) The Romanian side would provide 1/50,000 scale forestry maps to the Study Team for satellite image analysis of the study area.

(c) The Romanian side would provide offices with necessary equipment in Bucharest, Olt, and Dolj to the Study Team as soon as possible.

(d) The Romanian side would assist to select field workers in Olt and Dolj to the Study Team. The Study Team would employ them in accordance with the recommendation.

3. The Japanese side agreed to the following requests from the Romanian side.

(a) For investigation of forest decline, following subjects would be considered; air pollution, soil pollution and their long term monitoring.

(b) There is a great need in identifying the necessary technical measures which is to be used in the development of forest vegetation, so as to overcome the limitation factor which is represented by clay layers.

(c) Aspects regarding the harmful insects control will be considered exclusively on biological and other

similar methods so as not to affect the forestry ecosystem, which is already a very sensitive environment.

(d) A more profound research and development for the vegetative propagation of biological material.

(e) According to the requests of the Romanian side for map making methods, costs and the way of application of Thematic Maps, the Japanese side would prepare information about it.

ANNEX 2

LIST OF PARTICIPANTS

SUBJECT: The Inception Report for The Feasibility Study on Forests Restoration in Romania Plain
DATE : September 24 – 25, 29 1997
PLACE : Bucharest

The Ministry of Waters, Forests and Environment Protection

- Mr. Ioan Seceleanu - Secretary of State
- Mr. Filimon Carcea - Counselor to the Ministry
- Mr. Claudiu Zaharescu - Expert
- Mr. Ion Munteanu - Expert

The National Administration of Forestry

- Mr. Gheorghe Cahnita - General Director
- Mr. Dominic Denes - General Deputy Director
- Mr. Mihai Daia - Technical Director
- Mr. Dragos Mihai - Forest Protection
- Mr. Valerian Jinga - Expert
- Mr. Constantin Conduneanu - Chief of Service
- Mr. Traian Fulicea - Forest Protection
- Mr. Nicolae Avram - Forestry Fund
- Mr. Stelian Haroidon - Monitoring of Forest Use
- Mr. Liviu Furnicescu - Chief of Service Investment Division

Forest Research and Management Institute

- Mr. Ovidiu Badea - Scientific Director
- Dr. Constantin Rosu - Pedology
- Mr. Nicolae Donita - Expert

JICA Advisory Team:

- Mr. Takeo Mizoguchi - Silviculture
- Mr. Yasunori Nakayama - Coordinator

JICA Study Team

- Dr. Keiji Takeshita - Team Leader, Forest Expert
- Mr. Tadayoshi Komiya - Sub Leader, Financial and Economic Analysis
- Dr. Juemon Itoh - Sub Leader, Forest Ecology and Environment
- Mr. Kozo Yamagaki - Reforestation and Nursing
- Mr. Nobuo Enda - Forest Diseases and Harmful Insects
- Mr. Akihito Sakurai - Forest Management
- Mr. Hideto Hosoda - Satellite Image Analysis / Supervision of Aerial Photography
- Mr. Takeshi Yamazaki - Work Coordination

MINUTES OF MEETING
ON
PROGRESS REPORT
FOR THE FEASIBILITY STUDY
ON
FORESTS RESTORATION IN ROMANIAN PLAIN

In accordance with the Scope of Work for The Feasibility Study on Forests Restoration in Romanian Plain (hereinafter referred to as "the Study") agreed on April 16th 1997, Japan International Cooperation Agency (hereinafter referred to as "JICA") started the Study in September 1997 by dispatching JICA Study Team to Romania.

The Study Team visited Romania from March 1 to March 7 1998 as second field survey. The Team submitted twenty copies of the Progress Report, and had a presentation of the Progress Report to the officials concerned of MWFEP, RNP, and ICAS.

As a result of discussions, the Progress Report was accepted by the participants. The main issues discussed by the all attendance in relation to the Progress Report are shown in the ANNEX 1 as attached hereto.

Bucharest, March 6, 1998

Mr. Ioan SECELEANU
Secretary of State
Ministry of Waters, Forests and
Environment Protection
Romania

Dr. Juemon ITOH
Ag. Leader
JICA Study Team
Japan

Witnessed by

Mr. Takeo MIZOGUCHI
JICA Advisory Team
Japan

ANNEX 1

(1) The Forest Restoration Plan would be, in principle, prepared on forests which were classified as Decline Degree 2 or higher by the Romanian forest monitoring survey.

(2) Based on a joint schedule, the Romanian counterparts would accompany the Study Team for the entire duration of the third field survey and would cooperate with them.

(3) Technology transfer would be mainly conducted through "On the job training" in the second year.

(4) MWFEP facilitates the provision of the following items to the Study Team required for the Study: meteorological and hydrological data, and information on forest inventory books and topographical maps. The above items can freely be taken to Japan, according to the Romanian Law.

(5) MWFEP takes the necessary measures to obtain the permits and authorizations of the aerial photography and also taking them out from Romania to Japan.

(6) RNP Craiova and Slatina would record data of litter traps experiment after the Study Team goes back to Japan.

(7) The Romanian Side requested to be set more allocation of counterpart training in Japan for efficient technology transfer.

(8) The Romanian Side requested Japanese Study Team to acquire drivers and fuel for the two cars provided by JICA, when the Study Team is in Romania.

ANNEX 2

LIST OF PARTICIPANTS

SUBJECT: The Progress Report for the Feasibility Study on Forests Restoration in Romania Plain
DATE : March 3 – 6, 1998
PLACE : Bucharest

The Ministry of Waters, Forests and Environmental Protection – MWFEP

- Mr. Ioan Seceleanu - Secretary of State
- Mrs. Angelica Jucan – Director – Forest Management and Ecological Restoration
- Mr. Claudiu Zaharescu - Expert

The National Administration of the Forest – RNP

- Mr. Dominic Denes – Assistant General Director
- Mr. Mihai Daia - Technical Director
- Mr. Liviu Contescu – Chief of service – Forest Regeneration
- Mr. Iulian Bercea – Director – RNP Craiova
- Mr. Gheorghe Lazar – Expert – RNP Craiova – Forest Regeneration
- Mr. Ilie Suschievici – Technical Director – RNP Slatina

Forest Research and Management Institute – ICAS

- Mr. Ovidiu Badea - Scientific Director
- Dr. Constantin Rosu – Forest Site
- Mr. Gheorghe Marin – Technical Director – Forest Management Planning
- Dr. Nicolae Geambasu – Pedology

JICA Advisory Team

- Mr. Takeo Mizoguchi - Silviculture
- Mr. Yukihide Katsuta - Coordinator

JICA Study Team

- Dr. Juemon Itoh – Ag.Leader, Forest Ecology and Environment
- Mr. Tadayoshi Komiya - Sub Leader, Financial and Economic Analysis
- Mr. Hiroshi Takatoh - Soil

J. Itoh

MINUTES OF MEETING
ON
INTERIM REPORT
FOR THE FEASIBILITY STUDY
ON
FORESTS RESTORATION IN ROMANIAN PLAIN

In pursuance of the objective of the Scope of Work for The Feasibility Study on Forests Restoration in Romanian Plain (hereinafter referred to as "the Study") signed on April 16, 1997, Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Study Team for the Study (hereinafter refered to as "the Study Team") headed by Dr. Keiji TAKESHITA from February 22 to 26, 1999.

The Study Team submitted the 20 (twenty) copies of the Interim Report for the Study (hereinafter referred to as "the Interim Report") to the Romanian side and held a series of discussions with the Romanian Authorities concerned, as described in the following pages.

Bucharest,
February 25, 1999

Mr. Anton VLAD
Secretary of State
Ministry of Waters, Forests and
Environment Protection
Romania

Dr. Keiji TAKESHITA
Team Leader
JICA Study Team
Japan

Witnessed by

Mr. Yasunori NAKAYAMA
JICA Advisory Team
Japan

Based on the above mentioned discussions, both sides agreed on the following:

(a) The description and contents of Vegetation Maps, Forest Damage Classification Maps and Forest Restoration Planning Maps as proposed by the Study Team.

(b) The Fifth Field Survey will concentrate especially with regard to the following aspects:
- On field confirmation of aerial photo interpretation;
- Grouping of forest function for formulation of forest restoration plan;
- The cutting method: ratio of tree cutting;
- Reforestation methods: obtaining of the planting stock, planting density, mechanization works;
- Methods of natural regeneration encouragement;
- Infiltration Works: specification, relationship between soil moisture conditions and forest decline;
- Evaluation of the Plan: financial - economic Analysis.

(c) In order to improve the technical standards included in the Forest Restoration Plan, the restoration methods by damage grades and regeneration methods will be decided on the spot, during the Fifth Field Survey. The participants will be from ICAS, RNP and the Forest Branch Offices.

(d) Regarding the Seminar on Technology Transfer the following were set:
- Date: October, 1999 (The Sixth Field Survey)
- Place: Bucharest
- Themes: Causes of forest decline and countermeasures for restoration of declined forests; Evaluation of forest decline by interpretation of aerial photography.
- Participants:

  Romanian side: Staff of ICAS, RNP and the Forest Branch Offices.

  Japanese side: JICA Study Team and Advisory Team.
- Expenses
  - The Romanian Side will supply the necessary equipment, such as overhead projector, slide projector, etc. for the seminar.
  - The Study Team will bear the expenses for holding the seminar, such as rental fees for the seminar room, stationary, making documents, etc.
  - The Romanian side will bear the costs for the Romanian participants at the seminar, such as transportation expenses, hotel charges, etc.

(e) The Romanian side will resume the collection of data in order to record: the volume of precipitation, water quality and soil moisture starting with April 1999. The Romanian counterparts which were trained by JICA Study Team will carry out these works.

The list of participants is given in ANNEX 1, attached.

gm. A.V. K.T.

ANNEX I

List of Attendance

SUBJECT: Feasibility Study on Forests Restoration in Romanian Plain
DATE : February 22 – 25, 1999
PLACE : RNP, Bucharest

1. The Ministry of Waters, Forests and Environmental Protection (MWFEP)
   - Mr. Anton VLAD, Secretary of State
   - Ms. Angelica JUCAN, Engineer, Director
   - Mr. Claudiu ZAHARESCU, Engineer, Expert
   - Mr. Ion MUNTEANU, Engineer, Expert
2. The National Administration of Forestry (RNP)
   - Mr. Dorin CIUCA, General Director
   - Mr. Gheorghe DIMA, Director
   - Mr. Liviu CONTESCU, Senior Engineer, Forest Production
   - Mr.Mihai DAIA, Chief of Regeneration Department
   - Mr. Dragos MIHAI, Forest Engineer, Forest Protection
   - Mrs. Rodica UNGUREANU, Engineer, Chief of Service Ecological Reconstruction
   - Mr. Constantin RUSNAC, Chief of Forest Road Service
3. Valcea Forest Branch Office (RNP Valcea)
   - Mr. Alic SUSCHIEVICI, Main engineer, Forest Range Slatina
   - Mr. Adriel COTET, Forest Engineer, Forest Regeneration, Forest Branch Valcea
4. Targu-Jiu Forest Branch Office (RNP Targu-Jiu)
   - Mr. Constantin TROCAN, Technical Director, Forest Branch Targu-Jiu
   - Mr. Iulian BERCEA, Chief of Filiasi Range Forest, Forest Branch Targu-Jiu
   - Mr. Nicolae PARVU, engineer, Forest Branch Targu-Jiu
5. Targoviste Forest Branch Office
   - Mr. Dan-Robert SIMION, Chief of Gaesti Nursery, Forest Engineer, Forest Branch Targoviste
6. Forest Reseach and Management Institute (ICAS)
   - Mr. Stefan MOISE, Technical Director
   - Mr. George MAN, Scientific Secretary of ICAS
   - Mr. Ovidiu BADEA, Senior researcher
   - Mr. Gheorghe MARIN, Engineer
   - Dr. Constantin ROSU, Senior researcher
   - Dr. Nicolae GEAMBASU, Senior researcher
   - Dr. Nicolae DONITA, Expert
   - Mr. Viorel BLUJDEA, Researcher
   - Mr. Laurentiu POPOVICI, Senior researcher
   - Mr. Iovu Adrian BIRIS, Researcher
   - Mrs. Simona DRAGOI, Senior researcher
   - Mr. Vladimir GANCZ, Senior researcher
7. JICA Advisory Team
   - Mr. Yasunori NAKAYAMA, Coordinator
8. JICA Study Team
   - Dr. Keiji TAKESHITA, Team Leader
   - Dr. Juemon ITOH, Co-Leader,
   - Mr. Tadayoshi KOMIYA, Co-Leader

MINUTES OF MEETING
ON
THE DRAFT FINAL REPORT
OF
THE FEASIBILITY STUDY
ON
FORESTS RESTORATION IN ROMANIAN PLAIN

In pursuance of the objective of the Scope of Work for The Feasibility Study on Forests Restoration in Romanian Plain (hereinafter referred to as "the Study") signed on April 16, 1997, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Study Team for the Study (hereinafter referred to as "the Study Team") headed by Dr. Keiji TAKESHITA from October 31 to November 7, 1999.

The Study Team submitted the twenty (20) copies of the Draft Final Report for the Study (hereinafter referred to as "the Draft Final Report") in English to the Romanian side, and held a series of discussions with the Romanian Authorities concerned, and held a seminar in Bucharest on November 4, 1999.

The salient results of the discussions are described in Annex as attached hereto.

Bucharest,
November 5, 1999

Mr. Gheorghe LAZEA
General Secretary
Ministry of Waters, Forests and
Environment Protection,
Romania

Dr. Keiji TAKESHITA
Team Leader of the Study Team,
Japan Forest Civil Engineering
Consultants Foundation,
Japan

Witnessed by:

Mr. Motofumi KOHARA
Leader of the Advisory Team
Forestry and Fisheries Development Study Division,
Agriculture, Forestry and Fisheries Development
Study Department,
Japan International Cooperation Agency

Annex 1

1. The Conclusions of the Meeting on the Draft Final Report

(1) During the two-day explanation and discussion meeting, the Romanian side expressed the following opinions:

- It is desirable that the minimum area of damaged forests destined to cutting and reforestation to be enlarged to 5,000 m^2 or more for a proper growth of the planted trees.
- It is desirable that in the *Quercus* spp. damaged forests the belts for plowing to be larger than 10 m. Also in the *Robinia pseudoacacia* damaged forests with bad soil conditions in which planting of *Quercus* seedlings is planned. it is desirable that the works of soil preparations and plantings should to be done on the entire area.

(2) The Study Team responded as follows:

- Forests Restoration Plan was formulated according to the forest management techniques which were established during the on-site discussions held in June 1999 by the experts of both sides.
- The process of formulating Forest Restoration Plan based on the above-mentioned management techniques was described in the Draft Final Report. This process was fully understood by the Romanian side.

(3) The Romanian side can implement this plan with some necessary modifications for the action plans. Therefore, it was agreed that there is not necessary to change the content of the Draft Final Report.

2. Presentation of the Thematic Maps

The Romanian side received two (2) kinds of thematic maps of the Study as follows:

- Vegetation Maps
  One (1) set of the original maps
  One (1) set of the second original maps
  Three (3) sets of blue prints
- Forest Damage Classification Maps
  One (1) set of the original maps
  One (1) set of the second original maps
  Three (3) sets of blue prints

Also the Study Team presented the Forest Restoration Planning Maps (Draft) to the Romanian side. and the Romanian side agreed with the format of these maps.

The Forest Restoration Planning Maps will be submitted to the Romanian side together with the Final Report.

3. Comments on the Draft Final Report

The Romanian side will provide JICA with other comments on the Draft Final Report by November 30 after receipt of the Draft Final Report.

4. Final Report

Within two (2) months after receipt of the comments, JICA will send fifty (50) copies of the Final Report in English to the Romanian side. Both sides agreed that the Final Report would be available to any persons who have interest in the Study.

5. Survey Equipment

The Romanian side requested donation of the equipment used by the Study Team as attached in Annex 3. JICA agreed to take necessary measures after receiving the request from the Romanian side.

The list of participants is given in Annex 2, as attached.

Annex 2

List of Participants

SUBJECT: The Draft Final Report for the Feasibility Study on Forests Restoration in Romanian Plain
DATE: 2nd to 5th NOVEMBER 1999
PLACE: Bucharest, Romania

Ministry of Waters, Forests and Environmental Protection (MWFEP)
- Mr. Gheorghe LAZEA – General Secretary
- Mr. Tinel GHEORGHE – Director
- Dr. Angelica JUCAN – Chief of Compartment

The National Administration of Forestry (RNP)
- Mr. Gheorghe DIMA – Director
- Ms. Rodica UNGUREANU – Chief Afforestations
- Mr. Dragos MIHAI – Principal Engineer
- Mr. Liviu CONTESCU – Principal Engineer

Rannicu Valcea Forest Branch Office
- Mr. Alic SUSCHIEVIC – Principal Engineer
- Mr. Adriel COTET – Principal Engineer

Targu Jiu Forest Branch Office
- Mr. Cornel DUMBRAVA – Chief Afforestaions
- Mr. Nicolae PARVU – Principal Engineer
- Ms. Elena NUTA – Chief Engineer Ocolul Silvic Craiova

Targovisite Forest Branch Office
- Mr. Dan Robert SIMION – Chief Forest Nursery

Forest Research and Management Institute (ICAS)
- Mr. George MAN – Director
- Dr. Ovidiu BADEA – Scientific Director
- Mr. Stefan MOISE – Technical Director
- Dr. Nicolae GEAMBASU – Chief Ecology Laboratory
- Mr. Viorel BLUJDEA – Researcher
- Ms. Simona DRAGOI – Researcher
- Mr. Laurentiu POPOVICI – Researcher
- Mr. Adrian Iovu BIRIS – Researcher
- Dr. Constantin ROSU – Researcher
- Dr. Nicolae DONITA – Researcher

JICA JICV Romania Office
- Mr. Hiroaki OKUBO – Resident Representative

JICA Advisory Team
- Mr. Motofumi KOHARA – Director, JICA
- Dr. Takefumi IKEDA – Forest Ecology/Forest Protection
- Ms. Sayako TOKUDA – Coordinator, JICA

JICA Study Team
- Dr. Keiji TAKESHITA – Team Leader
- Mr. Tadayoshi KOMIYA – Sub Leader, Financial and Economic Analysis
- Mr. Akihito SAKURAI – Forest Management

Annex 3

List of Equipment

Description		Quantity
Soil EC Meter	Fujiwara Corp. SPAD PK-33	1
Soil pH Tester	Fujiwara Corp. SPAD PHS-120	1
Soil Nitric Acid Ion Meter	Fujiwara Corp. SPAD NOS-120	1
Water Nitric Acid Ion Meter	Fujiwara Corp. SPAD NOW-120	1
Electoric Tensiometer	Soil Moisture Equipment Corp. 5910-A	1
Soil Penetration Tester	Hasegawa Corp. H-100	1
Permeability Test Apparatus	Hasegawa Corp.	1