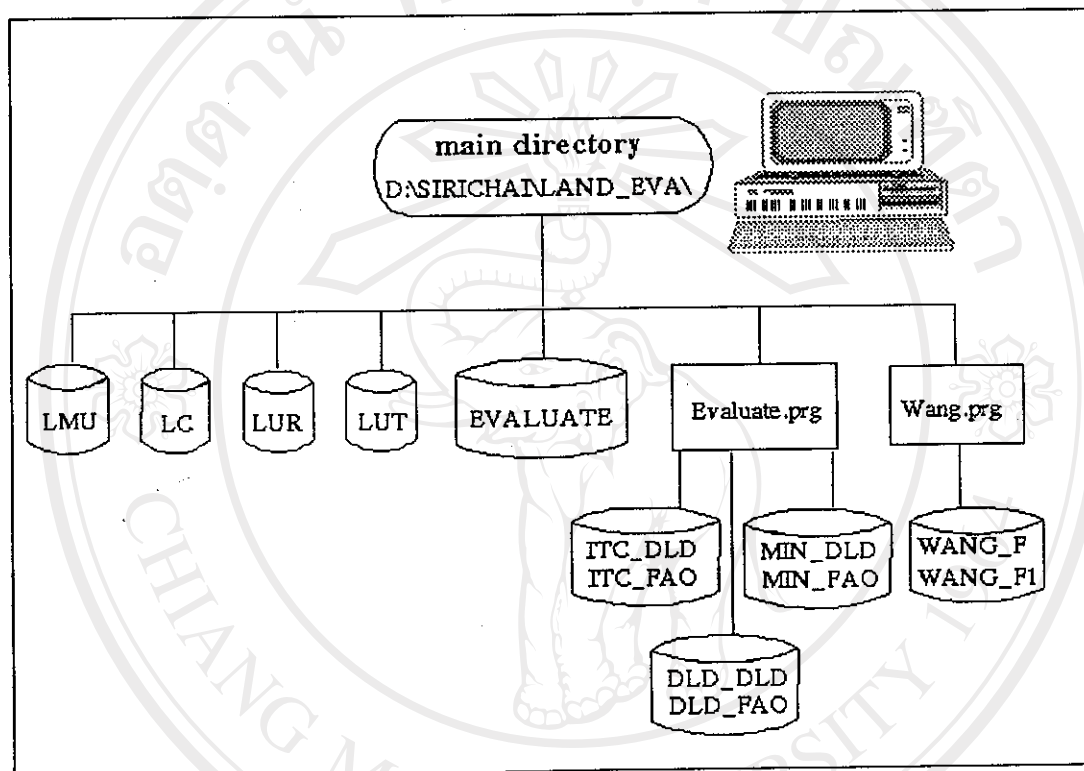


Appendix Figure 1. Spatial databases of the study area as organized and stored

in the harddisk.

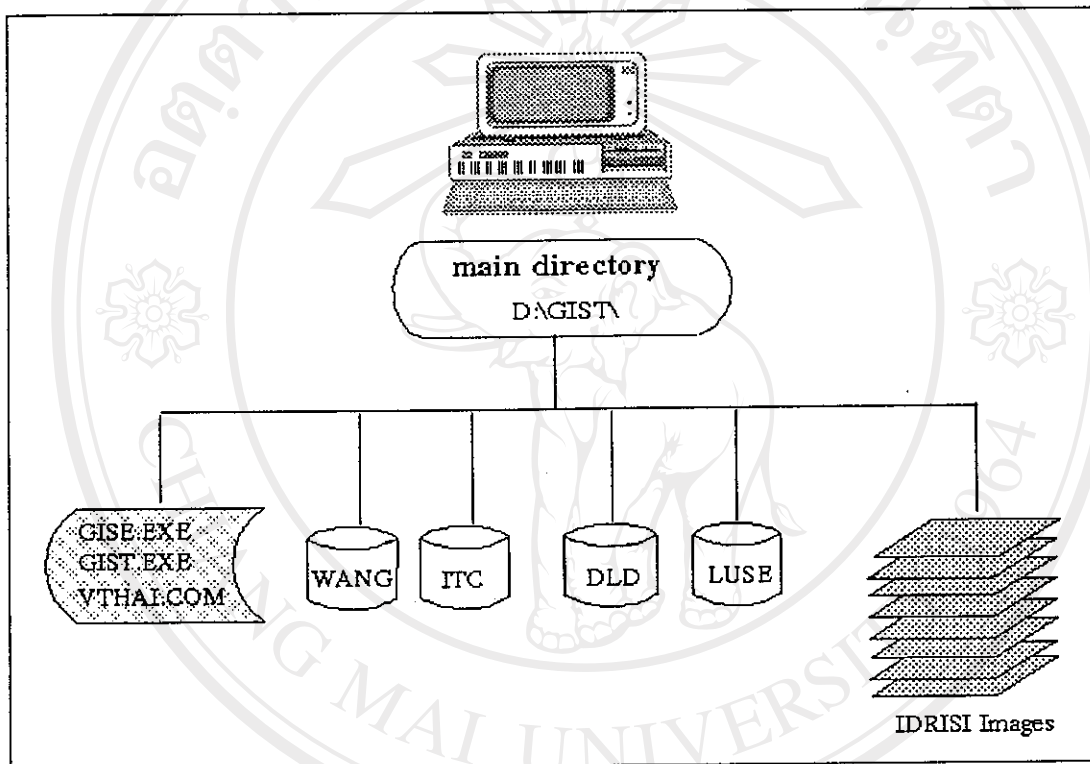


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Appendix Figure 2. Non-spatial databases and the land evaluation program

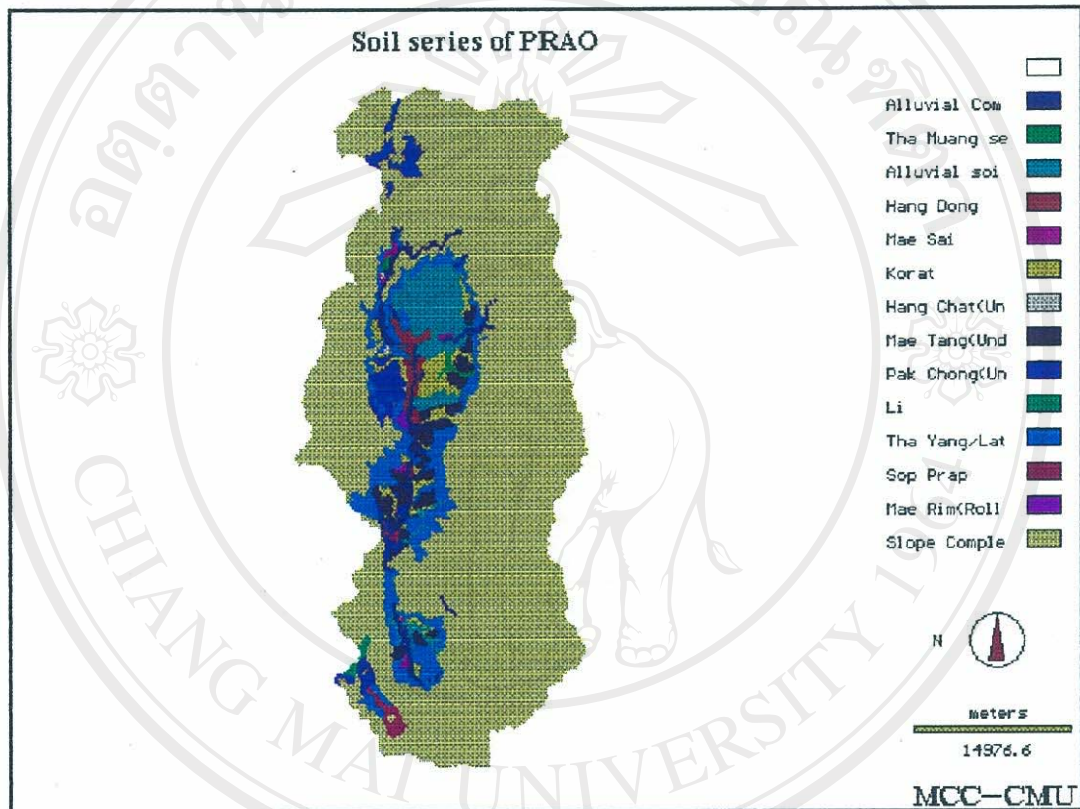
stored in the harddisk.

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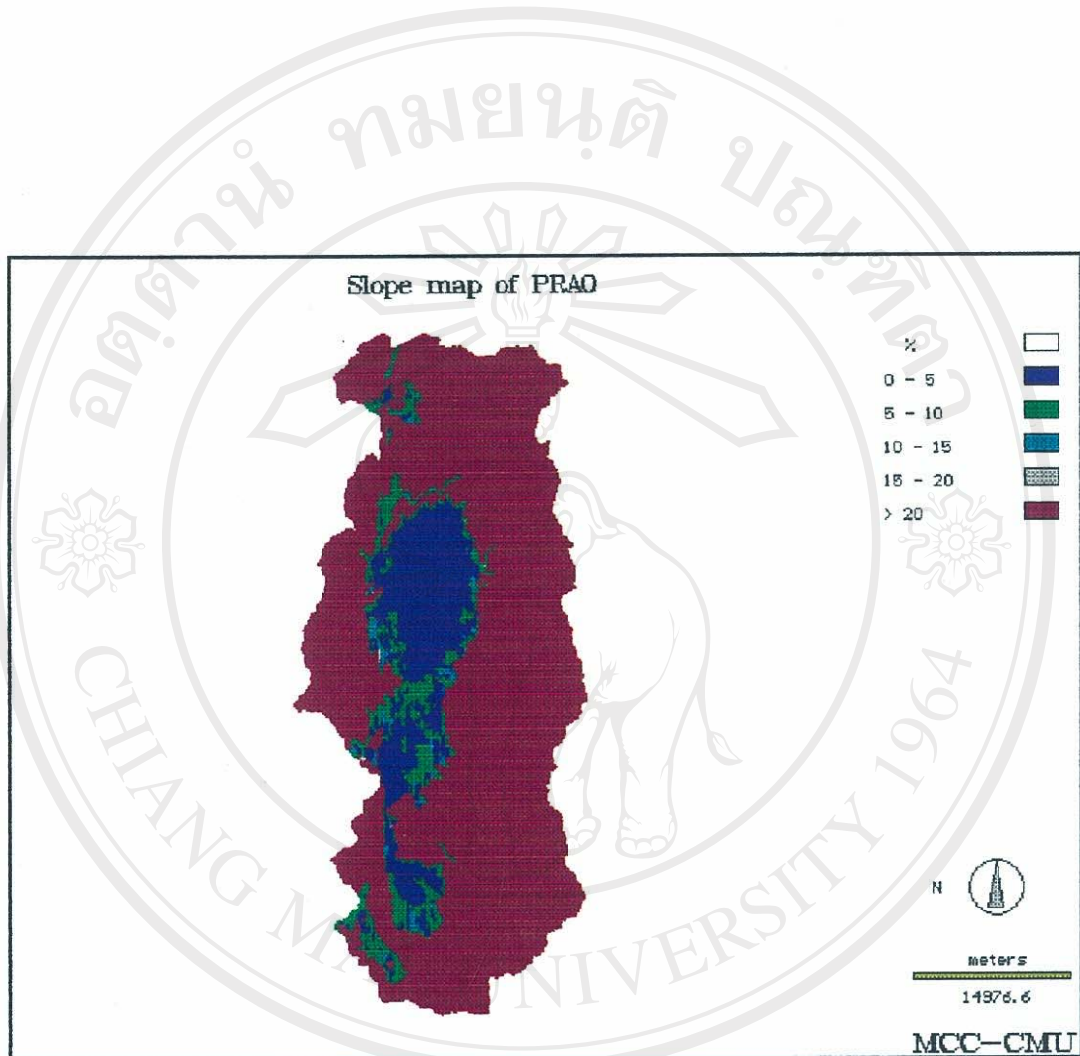
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Appendix Figure 3. The system shell component containing executable files, databases, and IDRISI images as stored in the harddisk.



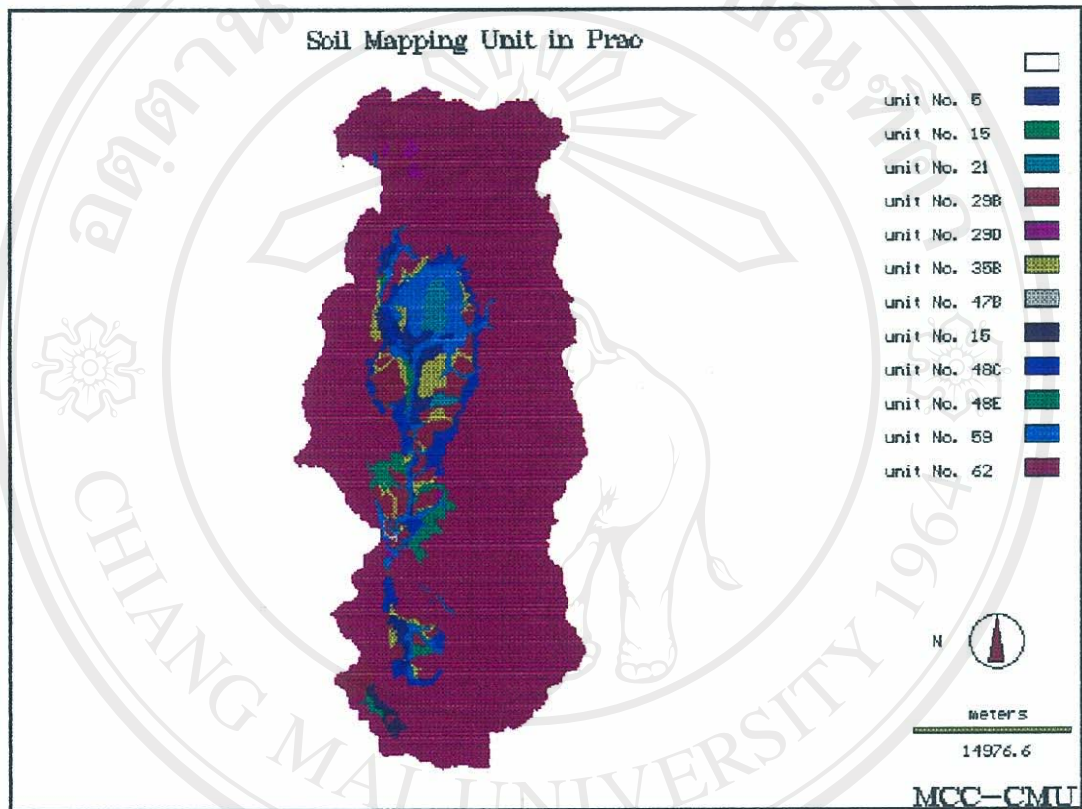
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Appendix Figure 4. Soil series map of Prao



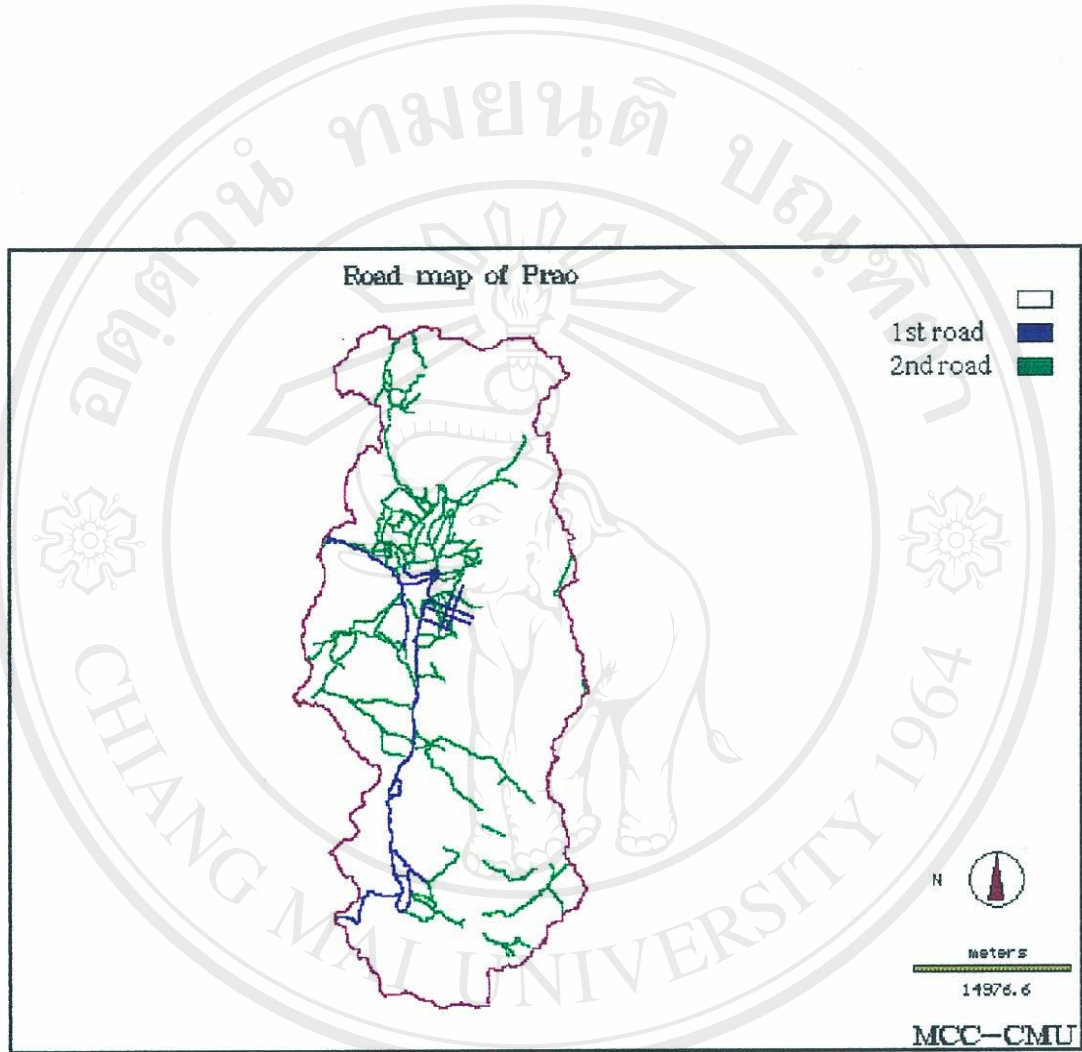
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Appendix Figure 5. Slope map of Prao



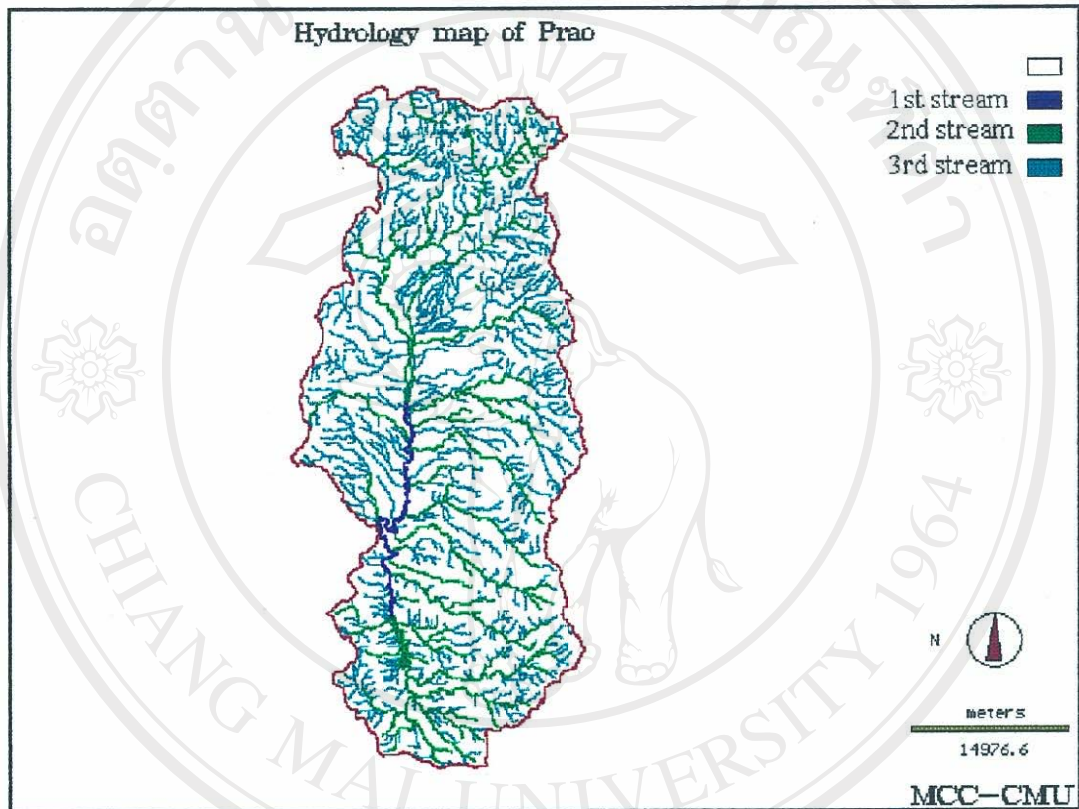
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Appendix Figure 6. Soil units map of Prao



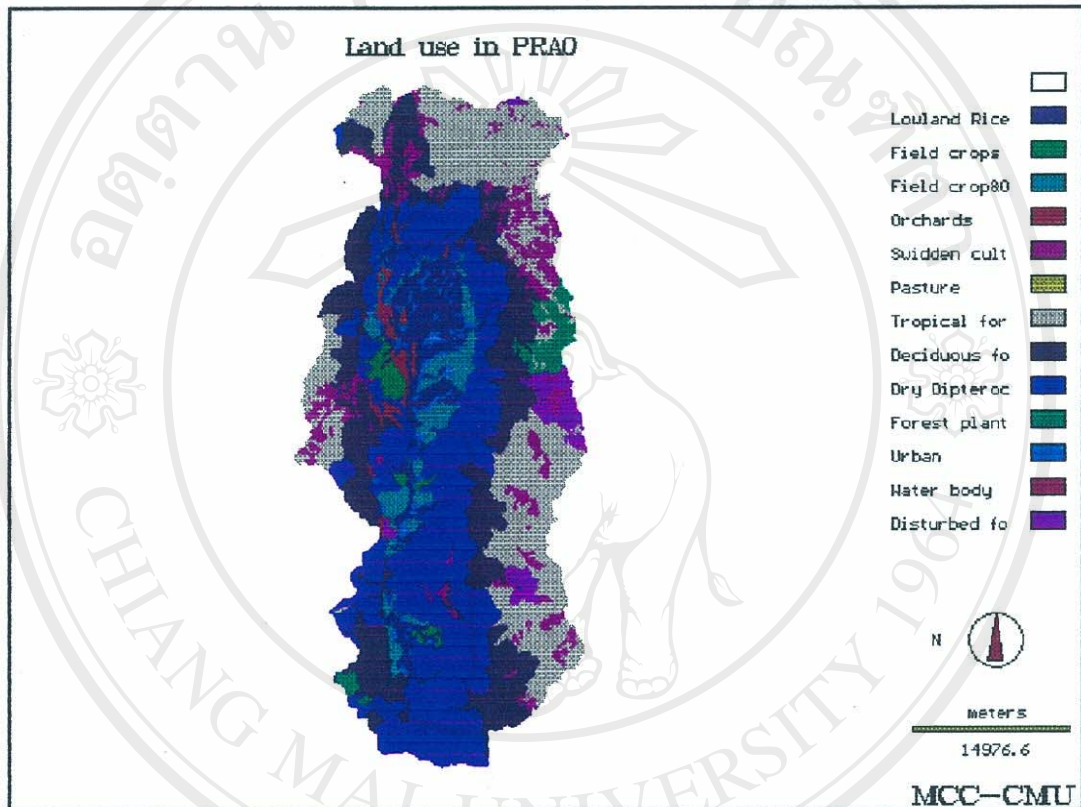
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Appendix Figure 7. Road map of Prao



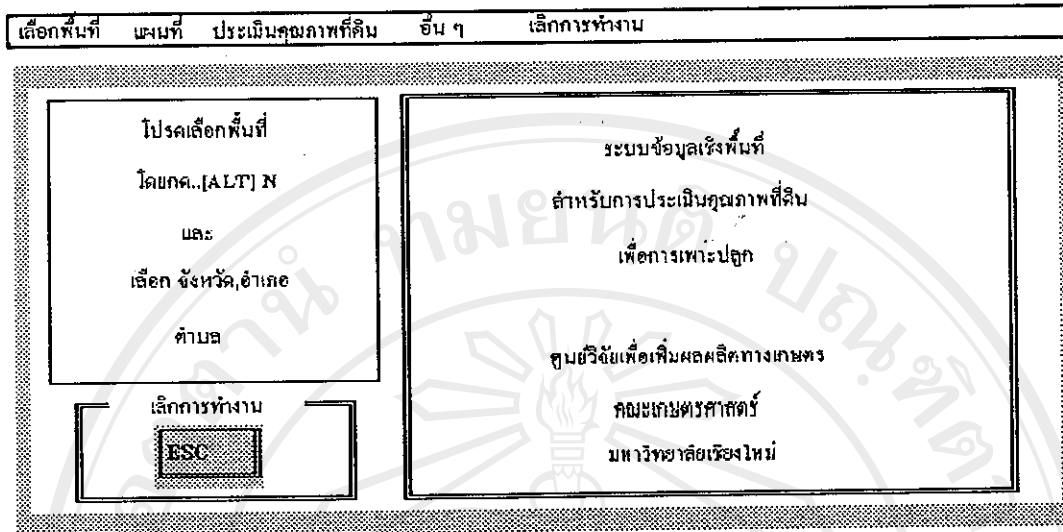
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Appendix Figure 8. Hydrology map of Prao

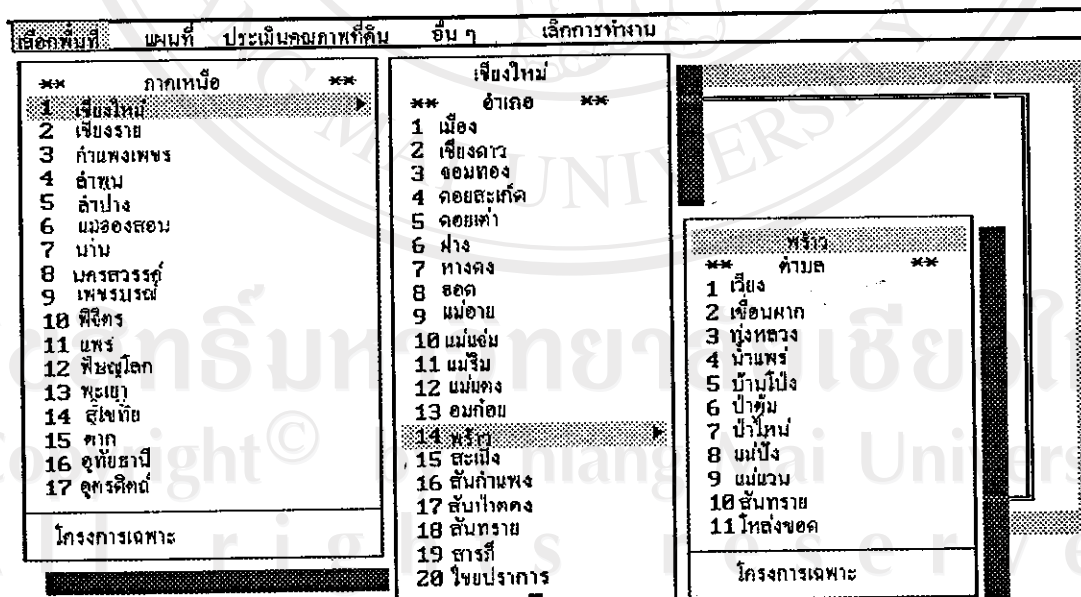


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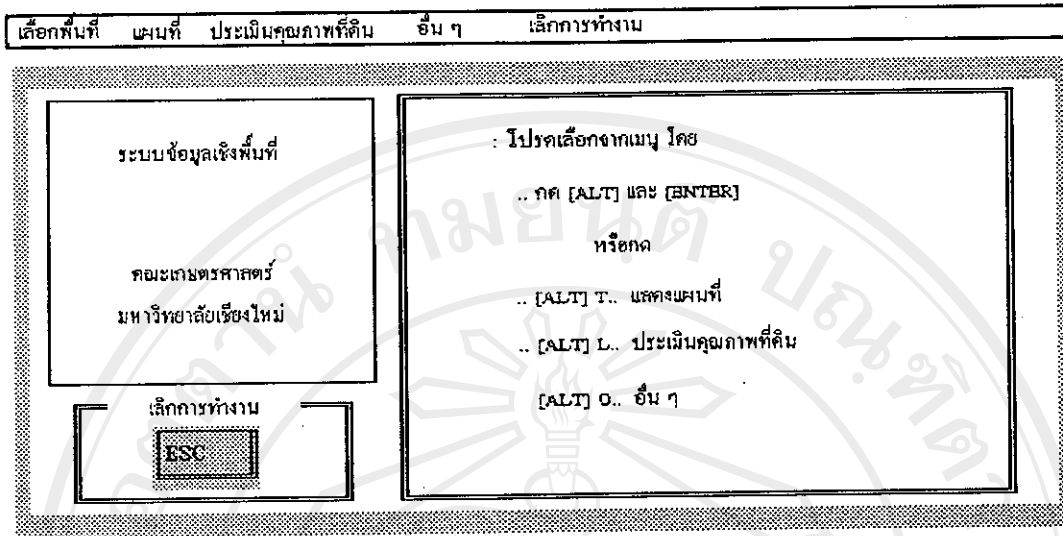
Appendix Figure 9. Present land use map of Prao



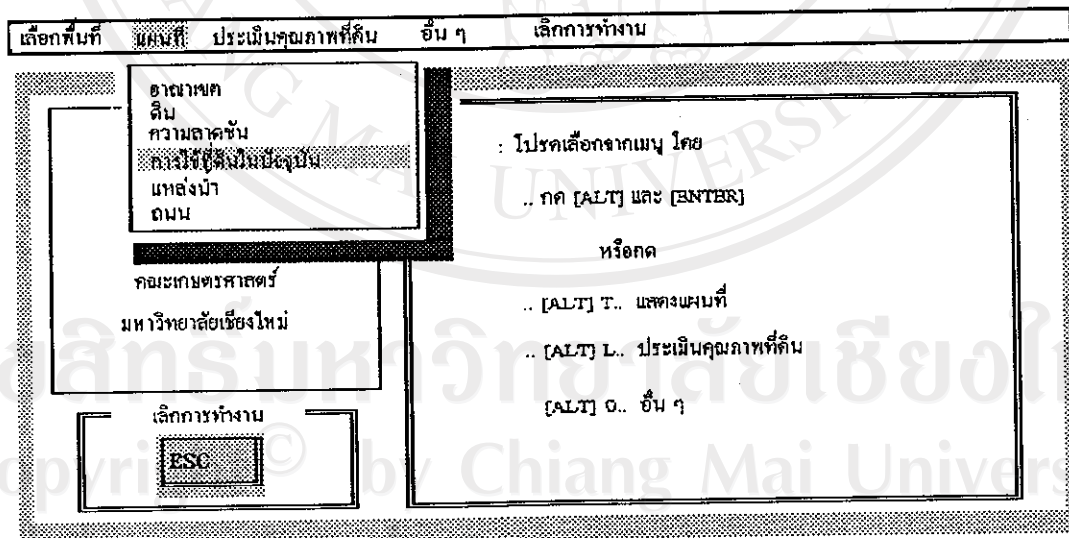
Appendix Figure 10. The starting menu of the system shell.



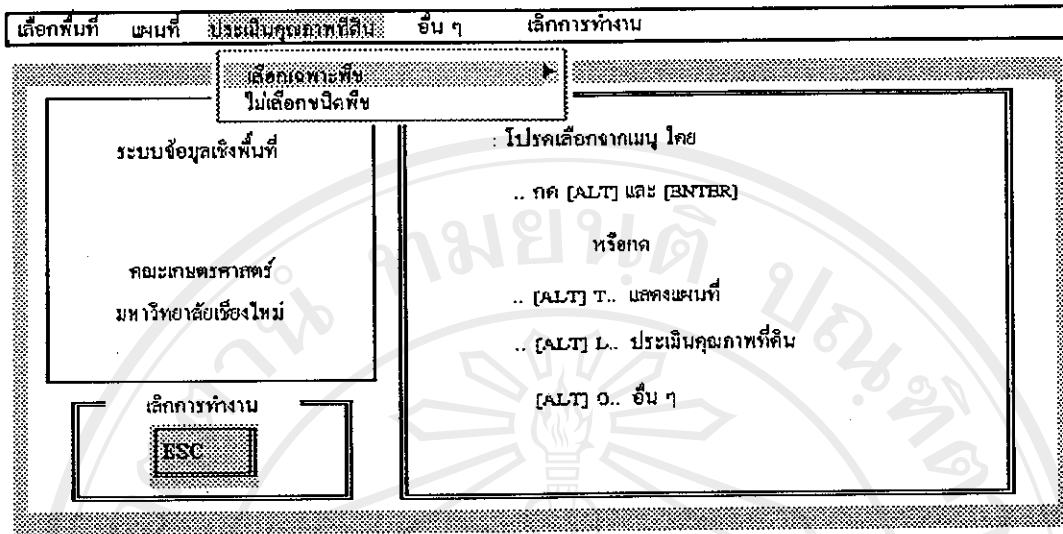
Appendix Figure 11. A menu to select the location.



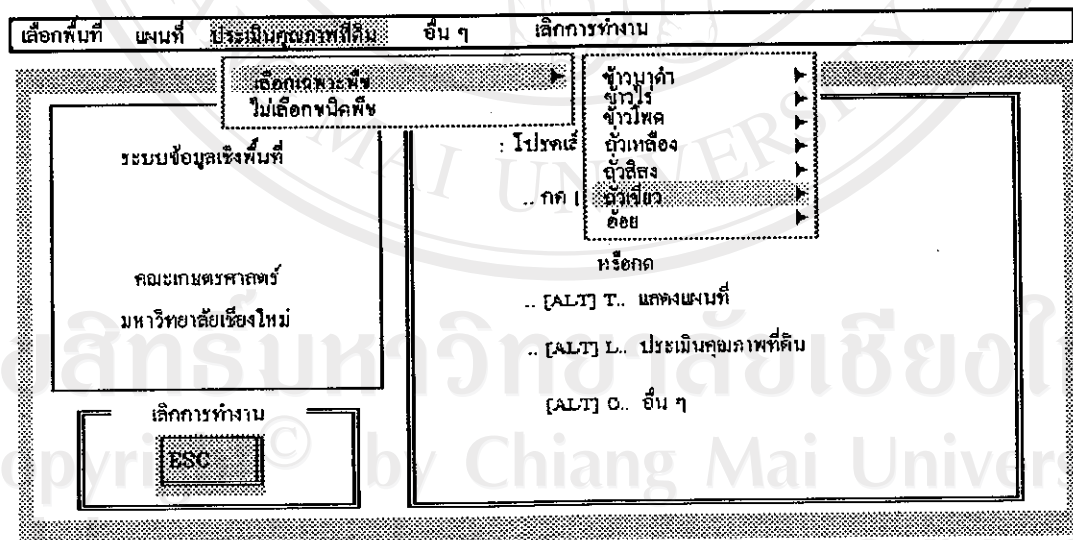
Appendix Figure 12. A menu to select thematic map, land evaluation or other.



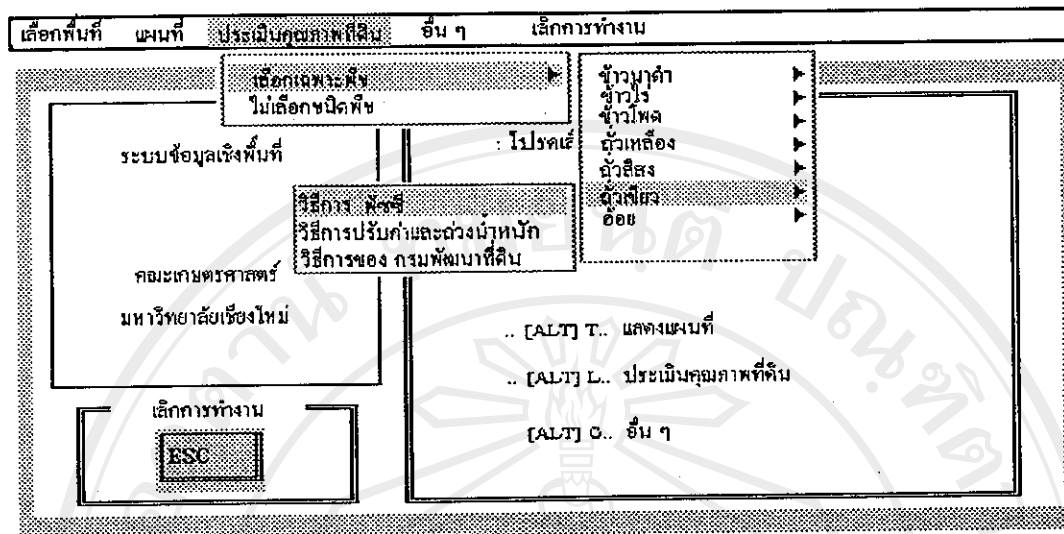
Appendix Figure 13. A menu to select thematic map.



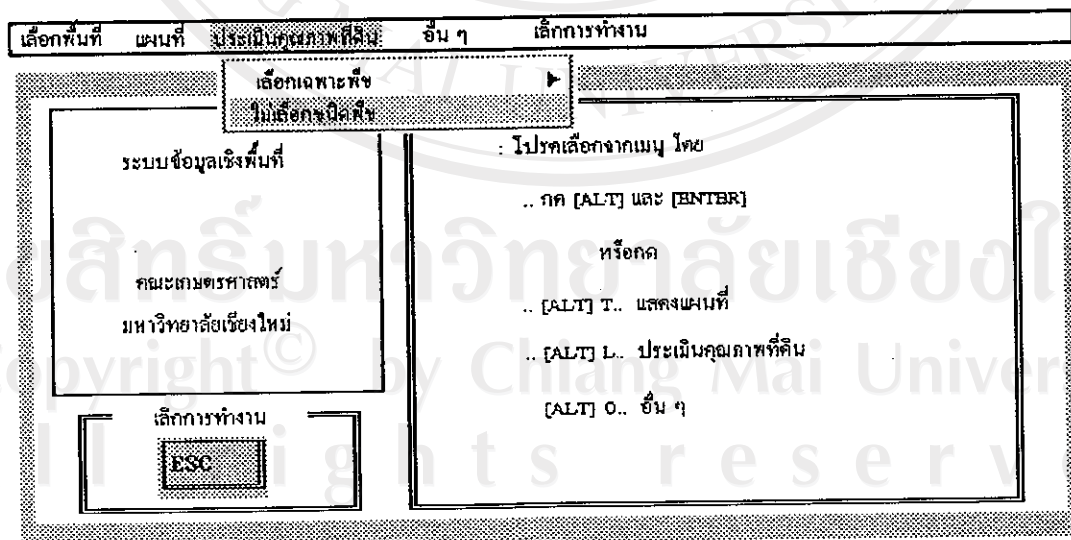
Appendix Figure 14. A menu to select land evaluation.



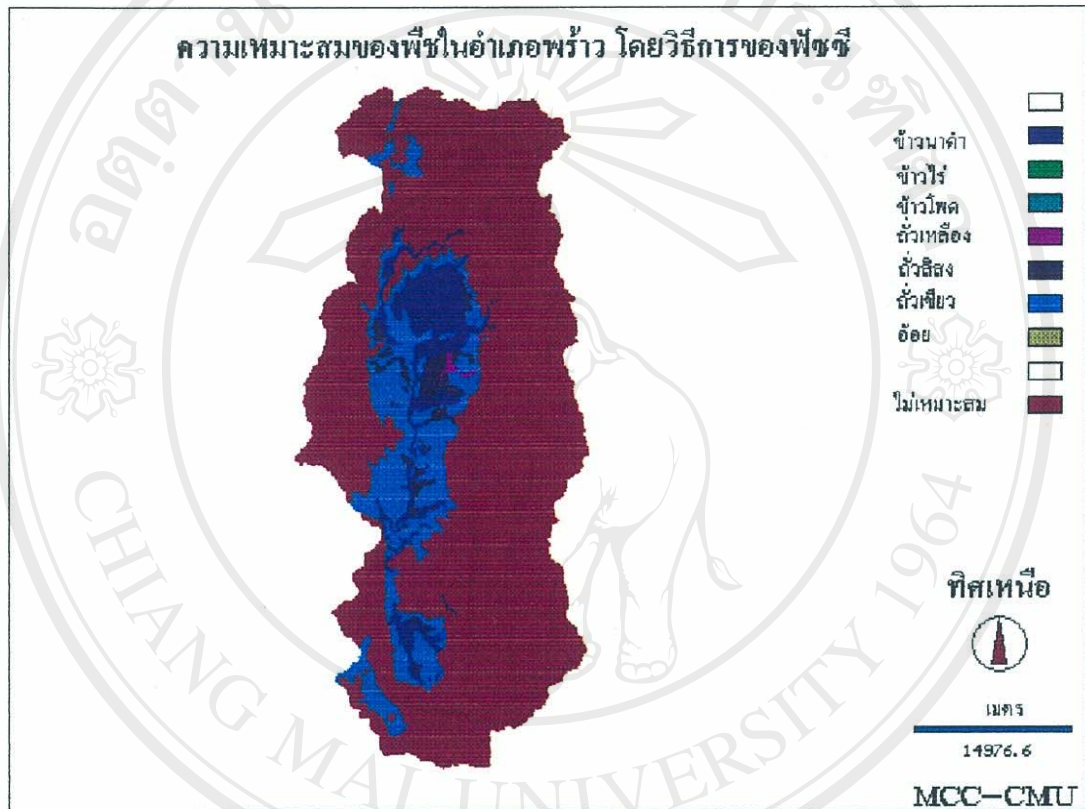
Appendix Figure 15. A menu to select absolute suitability evaluation and land utilization types to be evaluated.



Appendix Figure 16. Absolute suitability menu for selection of crop and evaluation method.



Appendix Figure 17. Relative suitability menu for selection of evaluation method.



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Appendix Figure 18. Relative suitability for different LUT in PRAO by Fuzzy land

evaluation and using the Photo Finish software to modify the

title and legend in Thai language for a hard copy.

Appendix Table 1. Data dictionary of Soil Series Coverage.

Coverage	
Path name	: D:\SIRICHA\CM_GIS\CMSOILF\PR_MF
Description	: Soil series of Prao, Chiang Mai
Projection	: Universal transverse mercator (UTM)
Origin	: Zone 47
Units	: meters
Features	
Info file name	: PAT.DBF
Structure name	: Area 13 N 0
	: Perimeter 13 N 6
	: PR_MF_11 N 0
	: PR_MF_ID 11 N 0
	: SOIL_ID 11 N 0
Description	: -
Unit	: none
Range	: 0 - 62
 Data Source Description	
Map title	
Name	: Soil series map of Prao district, Chiang Mai
Index *	: Sheet No. 4847 IV
Availability	
From whom	: Land Development Department
Cost	: None
Registration	
Area cover	: All Prao district
Scale	: 1:50,000
Projection	: UTM
Origin	: Zone 47
Tic #1 *	: 526000 , 2155000
Tic #2 *	: 526000 , 2129000
Tic #3 *	: 501000 , 2129000
Tic #4 *	: 501000 , 2155000
Features	
Area	: Soil series type
Templates	: Prao district and subdistrict.

* Each map sheet has different values.

Appendix Table 2. Data Dictionary of Soil Units Coverage.**Coverage**

Path name : D:\SIRICHA\CM_GIS\CMSOIL\PR_MS
 Description : Soil units of Prao, Chiang Mai
 Projection : Universal transverse mercator (UTM)
 Origin : Zone 47
 Units : meters

Features

Info file name : PAT.DBF
 Structure name : Area 13 N 0
 : Perimeter 13 N 6
 : PR_MS_11 N 0
 : PR_MS_ID 11 N 0
 : SOILID 11 N 0
 Description : -
 Unit : none
 Range : 0 - 66

Data Source Description**Map title**

Name : Soil units map of Prao district, Chiang Mai
 Index * : Sheet No. 4847 IV

Availability

From whom : Land Development Department
 Cost : None

Registration

Area cover : All Prao district
 Scale : 1:50,000
 Projection : UTM
 Origin : Zone 47
 Tic #1 * : 526000 , 2155000
 Tic #2 * : 526000 , 2129000
 Tic #3 * : 501000 , 2129000
 Tic #4 * : 501000 , 2155000

Features

Area : Soil unit type
 Templates : Prao district and subdistrict.

 * Each map sheet has different values.

Appendix Table 3. Data Dictionary of Contour Coverage.

Coverage	
Path name	: D:\SIRICHA\CM_GIS\CONTOUR\PR_CL
Description	: Contour map of Prao, Chiang Mai
Projection	: Universal transverse mercator (UTM)
Origin	: Zone 47
Units	: meters
Features	
Info file name	: AAT.DBF
Structure name	: Fnode_ 11 N 0
	: Tnode_ 11 N 0
	: Lpoly_ 11 N 0
	: Rpoly_ 11 N 0
	: Length 13 N 6
	: PR_CL 11 N 0
	: PR_CL_ID 11 N 0
Description	: -
Unit	: meter
Range	: 300 - 1900
Data Source Description	
Map title	
Name	: Contour map of Prao district, Chiang Mai
Index *	: Sheet No. 4847 IV
Availability	
From whom	: Royal Thai Survey Department
Cost	: None
Registration	
Area cover	: All Prao district
Scale	: 1:50,000
Projection	: UTM
Origin	: Zone 47
Tic #1 *	: 526000 , 2155000
Tic #2 *	: 526000 , 2129000
Tic #3 *	: 501000 , 2129000
Tic #4 *	: 501000 , 2155000
Features	
Line	: Contour line
Templates	: Prao district and subdistrict.

* Each map sheet has different values.

Appendix Table 4. Data Dictionary of Landuse Coverage.

Coverage	
Path name	: D:\SIRICHA\CM_GIS\CMLUSE\PR_ML
Description	: Land use map of Prao, Chiang Mai
Projection	: Universal transverse mercator (UTM)
Origin	: Zone 47
Units	: meters
Features	
Info file name	: PAT.DBF
Structure name	: Area 13 N 0
	: Perimeter 13 N 6
	: PR_ML_11 N 0
	: PR_ML_ID 11 N 0
	: LUSE 11 N 0
Description	: -
Unit	: none
Range	: 0 - 162
 Data Source Description	
Map title	
Name	: Land use map of Prao district, Chiang Mai
Index *	: Sheet No. 4847 IV
Availability	
From whom	: Land Development Department
Cost	: None
Registration	
Area cover	: All Prao district
Scale	: 1:50,000
Projection	: UTM
Origin	: Zone 47
Tic #1 *	: 526000 , 2155000
Tic #2 *	: 526000 , 2129000
Tic #3 *	: 501000 , 2129000
Tic #4 *	: 501000 , 2155000
Features	
Area	: Land use
Templates	: Prao district and subdistrict.

* Each map sheet has different values.

Appendix Table 5. Data Dictionary of Administrative boundary.**Coverage**

Path name : D:\SIRICHA\CM_GIS\CMTB\PR_TB
 Description : Administrative boundary of Prao, Chiang Mai
 Projection : Universal transverse mercator (UTM)
 Origin : Zone 47
 Units : meters

Features

Info file name : PAT.DBF
 Structure name : Area 13 N 0
 : Perimeter 13 N 6
 : PR_MT_11 N 0
 : PR_MT_ID 11 N 0
 : TAMBON 11 N 0

Description : -
 Unit : none
 Range : 0 - 11

Data Source Description**Map title**

Name : Administrative boundary of Prao district
 Index * : Sheet No. 4847 IV

Availability

From whom : Royal Thai Survey Department
 Cost : None

Registration

Area cover : All Prao district
 Scale : 1:50,000
 Projection : UTM
 Origin : Zone 47

Tic #1 * : 526000 , 2155000
 Tic #2 * : 526000 , 2129000
 Tic #3 * : 501000 , 2129000
 Tic #4 * : 501000 , 2155000

Features

Area : Administrative boundary
 Templates : Prao district and subdistrict.

* Each map sheet has different values.

Appendix Table 6. Data Dictionary of Road Coverage

Coverage	
Path name	: D:\SIRICHA\CM_GIS\CMROAD\PR_ROAD
Description	: Road map of Prao, Chiang Mai
Projection	: Universal transverse mercator (UTM)
Origin	: Zone 47
Units	: meters
Features	
Info file name	: AAT.DBF
Structure name	: Fnode_ 11 N 0
	: Tnode_ 11 N 0
	: Lpoly_ 11 N 0
	: Rpoly_ 11 N 0
	: Length 13 N 6
	: PR_ROAD 11 N 0
	: PR_ROAD_ID 11 N 0
Description	: -
Unit	: none
Range	: 1 - 3
Data Source Description	
Map title	
Name	: Road map of Prao district, Chiang Mai
Index *	: Sheet No. 4847 IV
Availability	
From whom	: Royal Thai Survey Department
Cost	: None
Registration	
Area cover	: All Prao district
Scale	: 1:50,000
Projection	: UTM
Origin	: Zone 47
Tic #1 *	: 526000 , 2155000
Tic #2 *	: 526000 , 2129000
Tic #3 *	: 501000 , 2129000
Tic #4 *	: 501000 , 2155000
Features	
Line	: Road
Templates	: Prao district and subdistrict.

* Each map sheet has different values.

Appendix Table 7. Data Dictionary of River Coverage

Coverage	
Path name	: D:\SIRICHA\CM_GIS\CMRIVER\PR_RIVER
Description	: Hydrology map of Prao, Chiang Mai
Projection	: Universal transverse mercator (UTM)
Origin	: Zone 47
Units	: meters
Features	
Info file name	: AAT.DBF
Structure name	: Fnode_ 11 N 0
	: Tnode_ 11 N 0
	: Lpoly_ 11 N 0
	: Rpoly_ 11 N 0
	: Length 13 N 6
	: PR_RIVER 11 N 0
	: PR_RIVER_ID 11 N 0
Description	: -
Unit	: none
Range	: 1 - 3
Data Source Description	
Map title	
Name	: Hydrology map of Prao district, Chiang Mai
Index *	: Sheet No. 4847 IV
Availability	
From whom	: Royal Thai Survey Department
Cost	: None
Registration	
Area cover	: All Prao district
Scale	: 1:50,000
Projection	: UTM
Origin	: Zone 47
Tic #1 *	: 526000 , 2155000
Tic #2 *	: 526000 , 2129000
Tic #3 *	: 501000 , 2129000
Tic #4 *	: 501000 , 2155000
Features	
Line	: River
Templates	: Prao district and subdistrict.

* Each map sheet has different values.

Appendix Table 8. The UTM of TIC #1-4 in Prao District on 8 map sheets which cover the study area.

Sheet No.	TIC #1	TIC #2	TIC #3	TIC #4
4848 II	552000, 2183000	552000, 2157000	527000, 2157000	527000, 2183000
4848 III	526000, 2183000	526000, 2157000	501000, 2157000	501000, 2183000
4847 I	552000, 2155000	552000, 2129000	527000, 2129000	527000, 2155000
4847 II	552000, 2128000	552000, 2101000	527000, 2101000	527000, 2128000
4847 III	526000, 2128000	526000, 2101000	501000, 2101000	501000, 2128000
4847 IV	526000, 2155000	526000, 2129000	501000, 2129000	501000, 2155000
4846 I	552000, 2100000	552000, 2074000	527000, 2074000	527000, 2100000
4846 IV	526000, 2100000	526000, 2074000	501000, 2074000	501000, 2100000

Appendix Table 9. Land use requirements (LUR) for wetland rice in different suitability ratings according to CSR/FAO (1983).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	25-29	30-32 24-22	33-35 21-18	>35 <18
Rainfall (mm)	> 1500	1200-1500	800-1200	< 800
Drainage	Moderately well, Somewhat poor	Very poor, Poor	Well	Somewhat excessive, Excessive
Texture	Sandy clay loam, Silt, Silt loam, Clay loam	Sandy loam, Loam, Silty clay loam, Silty clay, Structured clay	Loamy sand, Massive clay	Gravels, Sands
Rooting depth (cm)	> 50	41-50	20-40	<20
CEC me/100 g.soil	>=Medium	Low	Very low	
pH	5.5-7.0	7.1-8.0 5.4-4.5	8.1-8.5 4.6-4.0	>8.5 <4.0
Available P ₂ O ₅	Very high	High	Medium-Low	Very low
Available K ₂ O	>=Medium	Low	Very low	
Salinity (mmhos/cm)	< 3	3.1-5	5.1-8	>8
Slope (%)	0-3	3-5	5 - 8	>8

Appendix Table 10. Land use requirements (LUR) for upland rice in different suitability ratings according to CSR/FAO (1983).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	20-26	27-30 19-18	31-32 17-16	>32 <16
Rainfall (mm)	>1500	1500-1000	1000-750	<750
Drainage	Moderately well, Well	Somewhat poor, Poor	Very poor, Somewhat excessive	Excessive
Texture	Sandy clay loam, Silt, Silt loam, Silt clay loam, Clay loam	Sandy loam, Loam, Sandy clay	Loamy sand, Silty clay, Structured clay	Gravels, Sands massive clay
Rooting depth (cm)	> 60	40-59	20-39	<20
CEC me/100 g.soil	>=Medium	Low	Very low	
pH	5.0-6.0	6.1-7.0 4.9-4.5	7.1-8.5 4.5-4.0	>8.5 <4.0
Available P ₂ O ₅	>=High	Medium	Low	Very low
Available K ₂ O	>=Low	Very low		
Salinity (mmhos/cm)	< 3	3-5	5-8	>8
Slope (%)	0-5	5-15	15-24	>24

Appendix Table 11. Land use requirements (LUR) for soybean in different suitability ratings according to CSR/FAO (1983).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	23-28	29-30 22-20	31-32 19-18	>32 <18
Rainfall (mm)	1000-1500	1500-2500 1000-700	2500-3500 700-500	3500 <500
Drainage	Moderately well, well	Somewhat excessive	Poor, Somewhat poor	Very poor, Excessive
Texture	Loam, Sandy clay loam, Silt loam, Silt, Clay loam, silty clay loam	Sandy loam, Sandy clay	Loamy sand, Silty clay structured clay	Gravels, sands, massive clay
Rooting depth (cm)	> 50	30-49	15-29	<15
CEC me/100 g.soil	>=Medium	Low	Very low	
pH	6.0-7.0	7.1-7.5 5.9-5.5	7.6-8.5 5.4-5.0	>8.5 <5.0
Available P ₂ O ₅	>=High	Medium	Low-Very low	
Available K ₂ O	>=Very low			
Salinity (mmhos/cm)	<2.5	2.5-4	4-8	>8
Slope (%)	0-5	5-15	15-20	>20

Appendix Table 12. Land use requirements (LUR) for maize in different suitability ratings according to CSR/FAO (1983).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	20-26	27-30	31-32 20-18	>32 <18
Rainfall (mm)	>1200	1200-900	900-600	<600
Drainage	Moderately well, well	Somewhat poor	Somewhat excessive, Poor	Very poor, Excessive
Texture	Loam, Sandy clay loam, Silt loam, Silt, Clay loam, Silty clay loam	Sandy loam, Sandy clay	Loamy sand, Silty clay, Structured clay	Gravels, Sands, Massive clay
Rooting depth (cm)	> 60	40-59	20-39	<20
CEC me/100 g.soil	>=Medium	Low	Very low	
pH	6.0-7.0	7.1-7.5 5.9-5.5	7.6-8.5 5.4-5.0	>8.5 <5.0
Available P ₂ O ₅	Very high	High	Medium-Low	Very low
Available K ₂ O	>=Medium	Low	Very low	
Salinity (mmhos/cm)	<2	2-4	4-8	>8
Slope (%)	0-5	5-15	15-20	>20

Appendix Table 13. Land use requirements (LUR) for groundnut in different suitability ratings according to CSR/FAO (1983).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	25-30	31-33 24-20	34 19-18	>34 <18
Rainfall (mm)	900-2000	2000-3000 900-400	>3000 400-250	<250
Drainage	Well, Somewhat excessive	Moderately well, Excessive	Somewhat poor	Very poor, Poor
Texture	Loam, Sandy clay loam, Sandy loam	Loamy sand, Silt loam, Silt	Clay loam, Silty clay loam, Sandy clay, Silty clay, Struc tured clay	Gravels, Sands, Massive clay
Rooting depth (cm)	> 50	30-49	15-29	<15
CEC me/100 g. soil	>=Medium	Low	Very low	
pH	6.0-7.0	7.1-7.5 5.9-5.5	7.6-8.5 5.4-5.0	>8.5 <5.0
Available P ₂ O ₅	>=Medium	Low	Very low	
Available K ₂ O	>=Very low			
Salinity (mmhos/cm)	<3	3-4	4-6	>6
Slope (%)	0-5	5-15	15-20	>20

Appendix Table 14. Land use requirements (LUR) for mungbean in different suitability ratings according to CSR/FAO (1983).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	22-26	27-30 21-18	31-31 17	>32 <17
Rainfall (mm)	900-2000	2000-3000 900-600	>3000 600-350	<350
Drainage	Moderately well, Well	Somewhat excessive	Somewhat poor, Poor	Very poor, Excessive
Texture	Loam, Sandy clay loam, Silty loam, Silt	Loamy sand, Sandy loam, Clay loam, Silty clay loam	Sands, Sandy clay, Silty clay, Structured clay	Gravels, Massive clay
Rooting depth (cm)	> 50	30-49	15-29	<15
CEC me/100 g.soil	>=Medium	Low	Very low	
pH	6.0-7.0	7.1-7.5 5.9-5.5	7.6-8.5 <5.5	>8.5
Available P ₂ O ₅	>=Very low			
Available K ₂ O	>=Very low			
Salinity (mmhos/cm)	<1	1-2	2-4.5	>4.5
Slope (%)	0-5	5-15	15-20	>20

Appendix Table 15. Land use requirements (LUR) for sugarcane in different suitability ratings according to CSR/FAO (1983).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	25-30	31-32 24-23	33-34 22-21	>34 <21
Rainfall (mm)	1500-4000	1500-1200	< 4000 1200-1000	< 1000
Drainage	Moderately well, Well	Somewhat poor	Somewhat excessive, Poor	Very poor, Excessive
Texture	Sandy loam, Sandy clay loam, Loam, Silty loam, Silt, Clay loam, Silty clay loam	Loamy sand, Sandy clay	Silty clay, Structured clay	Gravels, Sands, Massive clay
Rooting depth (cm)	> 75	55-74	30-54	<30
CEC me/100 g soil	>=High	Medium	Low	Very low
pH	5.5-7.0	7.1-7.5 5.4-4.5	7.6-8.5 4.4-4.0	>8.5 <4.0
Available P ₂ O ₅	Very high	high	Medium-Low	Very low
Available K ₂ O	>=Medium	Low	Very low	
Salinity (mmhos/cm)	<3.5	3.5-5.5	5.5-12	>12
Slope (%)	0-8	8-15	15-20	>20

Appendix Table 16. Land use requirements (LUR) for wetland rice in different suitability ratings according to DLD (1992).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	22-30	31-33	34-35	>35
		21-20	19-18	<18
Rainfall (mm)	-	-	-	-
Effective rainfall (mm.)	700-800	550-700	400-550	<400
Soil Drainage	Very poor, Poor, Somewhat poor	Moderately well	Well	Excessive
Available P (ppm.)	>25	10-25	<10	-
Available K (ppm.)	>60	30-60	<30	-
Organic matter (%)	>3	1-3	<1	-
pH	5.6-7.3	7.4-7.8	7.8-8.4	>8.4
		5.1-5.5	4.0-5.0	<4.0
C.E.C (meq/100g.)	>15	5-15	<5	-
B.S. (%)	>50	35-50	<35	-
Effective soil depth(cm.)	>50	25-50	15-25	<15
Root penetration	1,2	3	4	-
Ec. of saturation (mmho/cm.)	<2	2-5	5-8	>8
slope (%)	0-2	2-5	5-12	>12
Rockout crop	1	2	3	4
Stoniness	1	2	3	4

Appendix Table 17. Land use requirements (LUR) for upland rice in different suitability ratings according to DLD (1992).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	20-26	27-30 19-18	31-32 17-16	>32 <16
Rainfall (mm)	-	-	-	-
Effective rainfall (mm.)	450-650	350-450	300-350	<300
Soil Drainage	Well, Excessive	Moderately well	Somewhat poor	Very poor, Poor
Available P (ppm.)	>15	10-15	3-10	<3
Available K (ppm.)	>30	<30	-	-
Organic matter (%)	>2.5	1-2.5	<1	-
pH	5.1-6.0	6.1-7.3 4.5-5.0	7.4-8.4 4.0-4.5	>8.4 <4.0
C.E.C (meq/100g.)	>15	5-15	<5	-
B.S. (%)	>35	<35	-	-
Effective soil depth (cm.)	>50	30-50	20-30	<20
Root penetration	1,2	3	4	-
Ec. of saturation (mmho/cm.)	<2	2-4	4-8	>8
slope (%)	0-5	5-12	12-20	>20
Rockout crop	1	2	3	4
Stoniness	1	2	3	4

Appendix Table 18. Land use requirements (LUR) for maize in different suitability ratings according to DLD (1992).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	20-25	26-31 23-20	32-35 19-16	>35 <16
Rainfall (mm)	-	-	-	-
Effective rainfall (mm.)	500-800	400-500	300-400	<300
Soil Drainage	Well, Excessive	Moderately well	Somewhat poor	Very poor, Poor
Available P (ppm.)	>25	6-25	<6	-
Available K (ppm.)	>60	30-60	<30	-
Organic matter (%)	>2.5	1.0-2.5	<1.0	-
pH	5.6-7.3	7.4-7.8 5.1-5.5	7.9-8.4 4.5-5.0	>8.4 <4.5
C.E.C (meq/100g.)	>15	3-15	<3	-
B.S. (%)	>50	<50	-	-
Effective soil depth (cm.)	>100	50-100	25-50	<25
Root penetration	1,2	3	4	-
Ec. of saturation (mmho/cm.)	<2	2-4	4-8	>8
slope (%)	0-5	5-12	12-20	>20
Rockout crop	1	2	3	4
Stoniness	1	2	3	4

Appendix Table 19. Land use requirements (LUR) for soybean in different suitability ratings according to DLD (1992).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	21-30	31-32 20-18	33-35 17-13	>35 <13
Rainfall (mm)	-	-	-	-
Effective rainfall (mm.)	450-700	450-350	300-350	<300
Soil Drainage	Well, Excessive	Moderately well	Somewhat poor	Very poor, Poor
Available P (ppm.)	>25	6-25	<6	-
Available K (ppm.)	>60	30-60	<30	-
Organic matter (%)	>2.5	1-2.5	<1	-
pH	5.6-7.3	7.4-7.8 5.1-5.5	7.9-8.4 4.5-5.0	>8.4 <4.5
C.E.C (meq/100g.)	>20	5-20	<5	-
B.S. (%)	>50	<50	-	-
Effective soil depth (cm.)	>500	50-100	25-50	<25
Root penetration	1,2	3	4	-
Ec. of saturation (mmho/cm.)	<2	2-4	4-8	>8
slope (%)	0-5	5-12	12-20	>20
Rockout crop	1	2	3	4
Stoniness	1	2	3	4

Appendix Table 20. Land use requirements (LUR) for groundnut in different suitability ratings according to DLD (1992).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	22-30	31-33 21-19	34-35 18-15	>35 <15
Rainfall (mm)	-	-	-	-
Effective rainfall (mm.)	400-600	350-400	300-350	<300
Soil Drainage	Well, Excessive	Moderately well	Somewhat poor	Very poor, Poor
Available P (ppm.)	>16	3-16	<3	-
Available K (ppm.)	>30	<30	-	-
Organic matter (%)	>1.5	0.5-1.5	<0.5	-
pH	5.6-7.3	7.4-7.8 5.1-5.5	7.9-8.4 5.0-4.5	>8.4 <4.5
C.E.C (meq/100g.)	>20	5-20	<5	-
B.S. (%)	>50	<50	-	-
Effective soil depth (cm.)	>50	30-50	20-30	<20
Root penetration	1	2	3	4
Ec. of saturation (mmho/cm.)	<3	3-4	4-6	>6
slope (%)	0-5	5-12	12-20	>20
Rockout crop	1	2	3	4
Stoniness	1	2	3	4

Appendix Table 21. Land use requirements (LUR) for mungbean in different suitability ratings according to DLD (1992).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	20-30	31-32 19-17	33-35 16-15	>35 <15
Rainfall (mm)	-	-	-	-
Effective rainfall (mm.)	350-500	250-350	200-250	<200
Soil Drainage	Well, Excessive	Moderately well	Somewhat poor	Very poor, Poor
Available P (ppm.)	>10	3-10	<3	-
Available K (ppm.)	>30	<30	-	-
Organic matter (%)	>2.5	1-2.5	<1	-
pH	6.1-6.5	6.6-7.8 5.1-6.0	7.9-8.4 4.5-5.0	>8.4 <4.5
C.E.C (meq/100g.)	>15	5-15	<5	-
B.S. (%)	>35	<35	-	-
Effective soil depth (cm.)	>50	30-50	15-30	<15
Root penetration	1,2	3	4	-
Ec. of saturation (mmho/cm.)	2	2-4	4-8	8
slope (%)	0-5	5-12	12-20	>20
Rockout crop	1	2	3	4
Stoniness	1	2	3	4

Appendix Table 22. Land use requirements (LUR) for sugarcane in different suitability ratings according to DLD (1992).

Characteristics	Suitability rating			
	S1	S2	S3	N
Temperature (°c)	24-27	28-31	32-35	>35
		23-19	18-15	<15
Rainfall (mm)	1600-2500	1200-1600	900-1200	<900
		2500-3000	3000-4000	>4000
Effective rainfall (mm.)	-	-	-	-
Soil Drainage	Well, Excessive	Somewhat poor, Moderately well	Poor	Very poor
Available P (ppm.)	>25	6-25	<6	-
Available K (ppm.)	>60	30-60	<30	-
Organic matter (%)	>2.5	1.5-2.5	<1.5	-
pH	5.6-7.3	7.4-7.8	7.9-8.4	>8.4
		4.5-5.5	4.0-4.5	<4.0
C.E.C (meq/100g.)	>15	5-15	<5	-
B.S. (%)	>75	35-75	<35	-
Effective soil depth (cm.)	>100	50-100	25-50	<25
Root penetration	1,2	3	4	-
Ec. of saturation (mmho/cm.)	<2.5	2.5-9	9-11	>11
slope (%)	0-5	5-12	12-20	>20
Rockout crop	1	2	3	4
Stoniness	1	2	3	4

Appendix Table 23. File structure of LUR in .DBF format.

Structure for database : D:\SIRICHAILAND_EVAL\LUR.DBF

Number of data records : 136

Date of last update : 10/11/93

Field	Field Name	Type	Width	Dec	Index
1	CROP	Character	32		
2	CLASS	Character	6		
3	C_TEMP	Numeric	7	1	
4	C_RAIN	Numeric	7	1	
5	C_DRAIN	Character	12		
6	C_TEXT	Character	41		
7	C_ROOT	Numeric	7		
8	C_CEC	Numeric	7	2	
9	C_PH	Numeric	7	2	
10	C_PHOSP	Numeric	7		
11	C_POTASI	Numeric	7		
12	C_SAL	Numeric	7	2	
13	C_SLOPE	Numeric	8	1	
14	TLO_HI	Numeric	3		
15	TUP_HI	Numeric	3		
16	TLO_LO	Numeric	3		
17	TUP_LO	Numeric			
18	R_LO	Numeric	4		
19	R_UP	Numeric	4		
20	RO_LO	Numeric	3		
21	RO_UP	Numeric	3		
22	PHLO_HI	Numeric	4	1	
23	PHUP_HI	Numeric	4	1	
24	PHLO_LO	Numeric	4	1	
25	PHUP_LO	Numeric	4	1	
26	C_EC	Character	15		
27	C_P	Character	15		
28	C_K	Character	15		
29	SAL_LO	Numeric	4	1	
30	SAL_UP	Numeric	4	1	
31	SLOP_LO	Numeric	3		
32	SLOP_UP	Numeric			
33	D_TLO_HI	Numeric			
34	D_TUP_HI	Numeric			
35	D_TLO_LO	Numeric			3
36	D_TUP_LO	Numeric			3
37	EFRA_LO	Numeric			5
38	EFRA_UP	Numeric			5
39	D_DRAIN	Character			12
40	D_P_LO	Numeric			4
41	D_P_UP	Numeric			4
42	D_K_LO	Numeric			4
43	D_K_UP	Numeric			4
44	D_ORG_LO	Numeric			5
45	D_ORG_UP	Numeric			5
46	D_PHLO_HI	Numeric			4
47	D_PHUP_HI	Numeric			4
48	D_PHLO_LO	Numeric			4
49	D_PHUP_LO	Numeric			4
50	D_CEC_LO	Numeric			3
51	D_CEC_UP	Numeric			3
52	D_BS_LO	Numeric			3
53	D_BS_UP	Numeric			3
54	D_SOIL_LO	Numeric			4
55	D_SOIL_UP	Numeric			4
56	D_EC_LO	Numeric			4
57	D_EC_UP	Numeric			4
58	D_SLOP_LO	Numeric			3
59	D_SLOP_UP	Numeric			3
60	D_ROCK	Character			1
61	D_STONE	Character			1
62	D_ROOT_PE	Numeric			2
** Total **					371

Appendix Table 24. File structure of LUT in .DBF format.

Structure for database : D:\SIRICHAI\BURROLUT.DBF

Number of data records : 33

Date of last update : 04/26/92

Field	Field Name	Type	Width	Dec	Index
1	CROP	Character	32		
** Total **			33		

Appendix Table 25. File structure of LMU in .DBF format.

Structure for database : D:\SIRICHAILAND_EVALMU.DBF

Number of data records : 973

Date of last update : 03/29/93

Field	Field Name	Type	Width	Dec	Index
1	AREA_ID	Numeric	13	6	
2	PRAO_	Numeric	11		
3	SOIL_ID	Numeric	11		
4	CODE	Character	8		
5	NAME	Character	12		
6	TCODE	Numeric	6		
7	S_SERIES	Character	10		
8	SLOPE	Numeric	11		
9	TEMP	Numeric	6	2	
10	RAIN	Numeric	7	2	
11	EF_RA_RI	Numeric	5		
12	EF_RA_FC	Numeric	5		
** Total **			106		

Appendix Table 26. File structure of LC in .DBF format.

Structure for database : D:\SIRICHAILAND_EVALC.DBF

Number of data records : 22

Date of last update : 10/05/93

Field	Field Name	Type	Width	Dec	Index
1	SOIL_ID	Numeric	7		Asc
2	S_SERIES	Character	10		
3	DRA	Character	10		
4	P2	Numeric	4		
5	K2	Numeric	4		
6	ORGANIC	Numeric	8	1	
7	PH2	Numeric	4	1	
8	CEC2	Numeric	5	1	
9	B_S	Numeric	3		
10	EFF_DEPT	Numeric	3		
11	EC	Numeric	8		3
12	ROCK	Character	5		
13	STONE	Character	5		
14	ROOT_PE	Numeric	8		
15	CONSIS	Character	20		
16	STRUCT	Character	20		
17	TEXT	Character	20		
18	DRAINAGE	Character	9		
19	TOPS_TEXT	Character	9		
20	ROOT_DEP	Numeric	0		
21	SUBS_CEC	Character	9		
22	TOPS_PH	Numeric	9	2	
23	TOPS_P	Character	9		
24	TOPS_K	Character	9		
25	SUBS_SALI	Numeric	9	2	
** Total **			213		

Appendix Table 27. Program listing of WANG.PRG to calculate fuzzy set by Fuzzy land evaluation method.

```
PROGRAM to CALCULATE FUZZY SUITABILITY
** WANG's METHOD *
4 DATABASES WILL BE USED
LUR ( Land Use Requirement, LUR)
LMU ( Land mapping unit, LMU )
LUT ( Land Utilization Type, LUT )
LC ( Land characteristics, LC)
DATA WILL BE CALCULATED TO PRODUCE
SUITABILITY RATING FOR
ABSOLUTE and RELATIVE SUITABILITY
```

```
clear
SET TALK OFF
CLOS ALL
CLEAR ALL
SET SAFETY OFF
SET DECIMALS TO 4
PUBL TX,TN,RAX,RAN,ROX,RON,CECX,CECN,;
PHX,PHN,PX,PN,KX,KN,SAX,SAN,SLX,SLN,;
Pdx,Pdn,Kdx,Kdn,ORGx,ORGn,CECdx,CECdn,;
BSn,BSx,ECx,ECn,ROCKx,ROCKn,STONx,STonn,;
SFIELD,SVFIELD,SUB_CEC, TOP_N, TOP_P,;
TOP_K,DRNOR,TENOR
```

***Definition of variables**

```
*TX = Maximum Temperature (°c);
*TN = Minimum Temperature (°c);
*RAX = Maximum Rainfall value (mm);
*RAN = Minimum Rainfall value (mm);
*ROX = Maximum Root depth (cm);
*RON = Minimum Root depth (cm);
*CECX = Maximum CEC (me/100 g.soil);
*CECN = Minimum CEC (me/100 g.soil);
*PHX = pH maximum;
*PHN = pH minimum;
*PX = Maximum Phosphorouse;
*PN = Minimum Phosphorouse;
*KX = Maximum Potassium;
*KN = Minimum Potassium;
*SAX = Maximum Salinity value (mmhos/cm);
*SAN = Minimum Salinity value (mmhos/cm);
*SLX = Maximum Slope (%);
*SLN = Minimum Slope (%);
*SUB_CEC = Transform data of CEC in Subsoil;
*TOP_N = Transform data of Nitrogen in Top Soil;
*TOP_P = Transform data of Phosphorouse in Soil;
*TOP_K = Transform data of Potassium in Top Soil;
*DRNOR = Transform data of Drainage;
*TENOR = Transform data of Texture;
```

```
choice1 = 0
DO WHILE .T.
@ 10,10 say 'Please select Land use requirement from
(1=DLD, 2=FAO)' get choice1
read
```

```
if choice1 = 1 or choice1 = 2
exit
endi
@ 11,50 say 'Please key number 1 or 2'
endd
```

```
@ 10,10 CLEAR TO 19,80
```

```
if choice1 = 1
Eva_met_lmu = 'DLD'
```

```
else
Eva_met_lmu = 'FAO'
endi
DO constant
SELECT 6
USE ABSOLUTE
zap
SELECT 4
if Eva_met_lmu = 'FAO'
use LC_FAO
else
use LC_DLD
endi
set order to tag soil_id
SELECT 3
USE LUR
go top
SELECT 1
USE LMU
if Eva_met_lmu = 'FAO'
set rela to soil_id into LC_FAO
else
set rela to soil_id into LC_DLD
endi
```

```
A_count = recc()
go top
SELECT 2
USE LUT
R_count = recc()
go top
tloop = 1
b = 40 / (R_count*2)
c = 20 + b
** value for idrisi soil_id = 66 and < 1
svid66 = 4
svid0 = 0
```

```
IF EOF()
@ 10,18 say 'CROP file did not ;
select to process.'
ELSE
@ 10,20 say "NOW ! process Wang Evaluation method; "
@ 11,25 say "with "+Eva_met_lmu+" Land characteristics"
@ 12,19,15,61 box
ENDI
```

```
** loop DEF_LUR ***
```

```
DO WHILE .T.
IF EOF()
EXIT
ENDI
M.CROP = ALLTRIM(UPPER(CROP))
SELECT 3
GO TOP
```

```
if Eva_met_lmu = 'FAO'
```

```
locate for ALLTRIM(UPPER(CROP))=M.CROP
T1 = C_TEMP
RA1 = C_RAIN
```

```

ROI = C_ROOT
PH1 = C_PH
SA1 = C_SAL
SL1 = C_SLOPE
DRNO1C = ALLTRIM(UPPER(C_DRAIN))
TEN01C = ALLTRIM(UPPER(C_TEXT))
DRNO1 = 8
TEN01 = 8
CECNO1 = C_CEC
PNO1 = C_PHOSP
KNO1 = C_POTASI

```

continue

```

T2 = C_TEMP
RA2 = C_RAIN
RO2 = C_ROOT
PH2 = C_PH
SA2 = C_SAL
SL2 = C_SLOPE
DRNO2C = ALLTRIM(UPPER(C_DRAIN))
TEN02C = ALLTRIM(UPPER(C_TEXT))
DRNO2 = 6
TEN02 = 6
CECNO2 = C_CEC
PNO2 = C_PHOSP
KNO2 = C_POTASI

```

continue

```

T3 = C_TEMP
RA3 = C_RAIN
RO3 = C_ROOT
PH3 = C_PH
SA3 = C_SAL
SL3 = C_SLOPE
DRNO3C = ALLTRIM(UPPER(C_DRAIN))
TEN03C = ALLTRIM(UPPER(C_TEXT))
DRNO3 = 4
TEN03 = 4
CECNO3 = C_CEC
PNO3 = C_PHOSP
KNO3 = C_POTASI

```

continue

```

T4 = C_TEMP
RA4 = C_RAIN
RO4 = C_ROOT
PH4 = C_PH
SA4 = C_SAL
SL4 = C_SLOPE
DRNO4C = ALLTRIM(UPPER(C_DRAIN))
TEN04C = ALLTRIM(UPPER(C_TEXT))
DRNO4 = 2
TEN04 = 2
CECNO4 = C_CEC
PNO4 = C_PHOSP
KNO4 = C_POTASI

```

*** TEMPERATURE

```

TSNO1 = ((T1-TN)/(TX-TN))*10
TSNO2 = ((T2-TN)/(TX-TN))*10
TSNO3 = ((T3-TN)/(TX-TN))*10
TSNO4 = ((T4-TN)/(TX-TN))*10

```

*** RAINFALL

```

RANO1 = ((RA1-RAN)/(RAX-RAN))*10
RANO2 = ((RA2-RAN)/(RAX-RAN))*10
RANO3 = ((RA3-RAN)/(RAX-RAN))*10
RANO4 = ((RA4-RAN)/(RAX-RAN))*10

```

*** ROOT

```

RONO1 = ((RO1-ROX)/(ROX-ROX))*10
RONO2 = ((RO2-ROX)/(ROX-ROX))*10
RONO3 = ((RO3-ROX)/(ROX-ROX))*10
RONO4 = ((RO4-ROX)/(ROX-ROX))*10

```

*** PH

```

PHNO1 = ((PH1-PHN)/(PHX-PHN))*10
PHNO2 = ((PH2-PHN)/(PHX-PHN))*10
PHNO3 = ((PH3-PHN)/(PHX-PHN))*10

```

```

PHNO4 = ((PH4-PHN)/(PHX-PHN))*10

```

*** SALINITY

```

SANO1 = ((SA1-SAN)/(SAX-SAN))*10
SANO2 = ((SA2-SAN)/(SAX-SAN))*10
SANO3 = ((SA3-SAN)/(SAX-SAN))*10
SANO4 = ((SA4-SAN)/(SAX-SAN))*10

```

*** SLOPE

```

SLNO1 = ((SL1-SLN)/(SLX-SLN))*10
SLNO2 = ((SL2-SLN)/(SLX-SLN))*10
SLNO3 = ((SL3-SLN)/(SLX-SLN))*10
SLNO4 = ((SL4-SLN)/(SLX-SLN))*10

```

else

locate for ALLTRIM(UPPER(CROP))=M.CROP

IF EFRA_LO = 0 AND EFRA_UP = 0

```

RA1av = (R_UP+R_LO)/2
RRR = 1

```

ELSE

```

RA1av = (EFRA_UP+EFRA_LO)/2
RRR = 2

```

ENDI

```

T1UH = D_TUP_HI
T1av = (D_TUP_HI+D_TLO_HI)/2
DR1 = ALLTRIM(UPPER(D_DRAIN))
P1L = D_P_LO
K1L = D_K_LO
OR1L = D_ORG_LO
PH1UH = D_PHUP_HI
PH1av = (D_PHUP_HI+D_PHLO_HI)/2
CEC1L = D_CEC_LO
BS1L = D_BS_LO
RO1L = D_SOIL_LO
SAL1av = (D_EC_UP+D_EC_LO)/2
SLOP1av = (D_SLOP_UP+D_SLOP_LO)/2
ROCK1 = ALLTRIM(UPPER(D_ROCK))
STONE1 = ALLTRIM(UPPER(D_STONE))
ROOT_PE1 = D_ROOT_PE

```

continue

IF RRR = 1

```

RA2av = (R_UP+R_LO)/2

```

ELSE

```

RA2av = (EFRA_UP+EFRA_LO)/2

```

ENDI

```

T2av = (D_TUP_HI+D_TLO_HI)/2
T2avL = (D_TUP_LO+D_TLO_LO)/2
DR2 = ALLTRIM(UPPER(D_DRAIN))
P2av = (D_P_UP+D_P_LO)/2
K2av = (D_K_UP+D_K_LO)/2
OR2av = (D_ORG_UP+D_ORG_LO)/2
PH2av = (D_PHUP_HI+D_PHLO_HI)/2
PH2avL = (D_PHUP_LO+D_PHLO_LO)/2
CEC2av = (D_CEC_UP+D_CEC_LO)/2
BS2av = (D_BS_UP+D_BS_LO)/2
RO2av = (D_SOIL_UP+D_SOIL_LO)/2
SAL2av = (D_EC_UP+D_EC_LO)/2
SLOP2av = (D_SLOP_UP+D_SLOP_LO)/2
ROCK2 = ALLTRIM(UPPER(D_ROCK))
STONE2 = ALLTRIM(UPPER(D_STONE))
ROOT_PE2 = D_ROOT_PE

```

continue

IF RRR = 1

```

RA3av = (R_UP+R_LO)/2

```

ELSE

```

RA3av = (EFRA_UP+EFRA_LO)/2

```

ENDI

```

T3av = (D_TUP_HI+D_TLO_HI)/2

```

```

T3avL = (D_TUP_LO+D_TLO_LO)/2

```



```

DR3 = ALLTRIM(UPPER(D_DRAIN))
P3av = (D_P_UP+D_P_LO)/2
K3av = (D_K_UP+D_K_LO)/2
OR3av = (D_ORG_UP+D_ORG_LO)/2
PH3av = (D_PHUP_HI+D_PHLO_HI)/2
PH3avL = (D_PHUP_LO+D_PHLO_LO)/2
CEC3av = (D_CEC_UP+D_CEC_LO)/2
BS3av = (D_BS_UP+D_BS_LO)/2
RO3av = (D_SOIL_UP+D_SOIL_LO)/2
SAL3av = (D_EC_UP+D_EC_LO)/2
SLOP3av = (D_SLOP_UP+D_SLOP_LO)/2
ROCK3 = ALLTRIM(UPPER(D_ROCK))
STONE3 = ALLTRIM(UPPER(D_STONE))
ROOT_PE3 = D_ROOT_PE

```

```

continue
IF RRR = 1
RA4av = (R_UP+R_LO)/2
ELSE
RA4av = (EFRA_UP+EFRA_LO)/2
ENDI
T4av = (D_TUP_HI+D_TLO_HI)/2
T4avL = (D_TUP_LO+D_TLO_LO)/2
DR4 = ALLTRIM(UPPER(D_DRAIN))
P4av = (D_P_UP+D_P_LO)/2
K4av = (D_K_UP+D_K_LO)/2
OR4av = (D_ORG_UP+D_ORG_LO)/2
PH4av = (D_PHUP_HI+D_PHLO_HI)/2
PH4avL = (D_PHUP_LO+D_PHLO_LO)/2
CEC4av = (D_CEC_UP+D_CEC_LO)/2
BS4av = (D_BS_UP+D_BS_LO)/2
RO4av = (D_SOIL_UP+D_SOIL_LO)/2
SAL4L = D_EC_LO
SLOP4L = D_SLOP_LO
ROCK4 = ALLTRIM(UPPER(D_ROCK))
STONE4 = ALLTRIM(UPPER(D_STONE))
ROOT_PE4 = D_ROOT_PE
endi

```

```

** CALCULATE SUITABILITY OF EACH LMU **

```

```

select 1
go top
DO WHILE .T.
if eof()
exit
endi
IF recno() = INT((A_count/2))
@ 13,20,14,c BOX replicate(chr(178),9)
c = c+b
ENDI
M.AREA = PRAO_
IF SOIL_ID < 1
IF tloop = 1
sele 6
appe blank
repl AREA_ID with m.area
repl PRAO_ with m.area
repl crop1 with ''
repl grade1 with 0
repl c1 with m.crop
repl suit_c1 with svid0
else
sele 6
repl &fcrop with ''
repl &fgrade with 0
repl &fclass with M.CROP
repl &fc_id with svid0
skip
endi

```

```

SELECT 1
skip
loop
ENDI
IF SOIL_ID = 66
IF tloop = 1
sele 6
appe blank
repl AREA_ID with m.area
repl PRAO_ with m.area
repl crop1 with ''
repl grade1 with 0
repl c1 with 'N'
repl suit_c1 with svid66
else
sele 6
repl &fcrop with ''
repl &fgrade with 0
repl &fclass with 'N'
repl &fc_id with svid66
skip
endi
SELECT 1
skip
loop
ENDI

```

```

IF Eva_met_lmu = 'FAO'

```

```

m.soil_id = soil_id
m.slope = slope
m.rain = rain
m.temp = temp
select 4
m.drain = '%'+UPPER(ALLTRIM(drainage))+%'
m.text = '%'+UPPER(ALLTRIM(tops_text))+%'

```

```

DO DEF_VAL
TNOR = ((M.TEMP-TN)/(TX-TN))*10
RANOR = ((M.RAIN-RAN)/(RAX-RAN))*10
RONOR = ((ROOT_dep-RON)/(ROX-RON))*10
CECNOR = ((sub_CEC-CECN)/(CECX-CECN))*10
PHNOR = ((tops_PH-PHN)/(PHX-PHN))*10
PNOR = ((top_P-PN)/(PX-PN))*10
KNOR = ((top_K-KN)/(KX-KN))*10
SANOR = ((subs_sali-SAN)/(SAX-SAN))*10
SLNOR = ((m.SLOPE-SLN)/(SLX-SLN))*10
select 1

```

```

ELSE

```

```

m.soil_id = soil_id
m.slope = slope
m.rain1 = rain
m.temp = temp

```

```

if m.crop = "WETLAND RICE"
m.rain = ef_ra_ri
else
m.rain = ef_ra_fc
endi

```

```

if RRR = 1
m.rain = m.rain1
endi

```

```

IF RRR <> 1
RAX = 1500
ENDI

```

```

SELECT 4
m.drain = '%'+UPPER(ALLTRIM(dra))+%'

```

```

m.org = organic
m.ph = ph2
m.sal = ec
m.rock = VAL(UPPER(ALLTRIM(rock)))
m.stone = VAL(UPPER(ALLTRIM(stone)))
m.root_pe = root_pe

IF p2 > P1L
  m.p = P1L
ELSE
  m.p = p2
ENDI
IF k2 > K1L
  m.k = K1L
ELSE
  m.k = k2
ENDI
IF cec2 > CEC1L
  m.cec = CEC1L
ELSE
  m.cec = cec2
ENDI
IF B_s > BS1L
  m.bs = BS1L
ELSE
  m.bs = B_s
ENDI
IF eff_dept > RO1L
  m.root = RO1L
ELSE
  m.root = eff_dept
ENDI

DO DEF_VAL1

SELECT 1

  TNOR = ((M.TEMP-TN)/(TX-TN))*10
  PHNOR = ((M.PH-PHN)/(PHX-PHN))*10
  RANOR = ((M.RAIN-RAN)/(RAX-RAN))*10
  PNOR = ((M.P-PdN)/(PdX-PdN))*10
  KNOR = ((M.K-KdN)/(KdX-KdN))*10
  ORGNO = ((M.ORG-ORGN)/(ORGX-ORGN))*10
  CECNOR = ((M.CEC-CECdN)/(CECdX-CECdN))*10
  BSNOR = ((M.BS-BSN)/(BSX-BSN))*10
  RONOR = ((M.ROOT-RON)/(ROX-RON))*10
  SANOR = ((M.SAL-ECN)/(ECX-ECN))*10
  SLNOR = ((M.SLOPE-SLN)/(SLX-SLN))*10

IF M.TEMP > T1UH
  TSNO1 = ((T1av-TN)/(TX-TN))*10
  TSNO2 = ((T2av-TN)/(TX-TN))*10
  TSNO3 = ((T3av-TN)/(TX-TN))*10
  TSNO4 = ((T4av-TN)/(TX-TN))*10
ELSE
  TSNO1 = ((T1av-TN)/(TX-TN))*10
  TSNO2 = ((T2avL-TN)/(TX-TN))*10
  TSNO3 = ((T3avL-TN)/(TX-TN))*10
  TSNO4 = ((T4avL-TN)/(TX-TN))*10
ENDI

IF M.PH > PH1UH
  PHNO1 = ((PH1av-PHN)/(PHX-PHN))*10
  PHNO2 = ((PH2av-PHN)/(PHX-PHN))*10
  PHNO3 = ((PH3av-PHN)/(PHX-PHN))*10
  PHNO4 = ((PH4av-PHN)/(PHX-PHN))*10
ELSE
  PHNO1 = ((PH1av-PHN)/(PHX-PHN))*10
  PHNO2 = ((PH2avL-PHN)/(PHX-PHN))*10
  PHNO3 = ((PH3avL-PHN)/(PHX-PHN))*10
  PHNO4 = ((PH4avL-PHN)/(PHX-PHN))*10
ENDI

```

```

RANO1 = ((RA1av-RAN)/(RAX-RAN))*10
RANO2 = ((RA2av-RAN)/(RAX-RAN))*10
RANO3 = ((RA3av-RAN)/(RAX-RAN))*10
RANO4 = ((RA4av-RAN)/(RAX-RAN))*10
*** [P]
PNO1 = ((P1L-Pdn)/(PdX-PdN))*10
PNO2 = ((P2av-Pdn)/(PdX-PdN))*10
PNO3 = ((P3av-Pdn)/(PdX-PdN))*10
PNO4 = ((P4av-Pdn)/(PdX-PdN))*10
** [K]
KNO1 = ((K1L-Kdn)/(KdX-KdN))*10
KNO2 = ((K2av-Kdn)/(KdX-KdN))*10
KNO3 = ((K3av-Kdn)/(KdX-KdN))*10
KNO4 = ((K4av-Kdn)/(KdX-KdN))*10
** [ORGANIC]
ORGNO1 = ((OR1L-ORGN)/(ORGX-ORGN))*10
ORGNO2 = ((OR2av-ORGN)/(ORGX-ORGN))*10
ORGNO3 = ((OR3av-ORGN)/(ORGX-ORGN))*10
ORGNO4 = ((OR4av-ORGN)/(ORGX-ORGN))*10
** [CEC]
CECNO1 = ((CEC1L-CECdN)/(CECdX-CECdN))*10
CECNO2 = ((CEC2av-CECdN)/(CECdX-CECdN))*10
CECNO3 = ((CEC3av-CECdN)/(CECdX-CECdN))*10
CECNO4 = ((CEC4av-CECdN)/(CECdX-CECdN))*10
** [BASE_SAT]
BSNO1 = ((BS1L-BSn)/(BSX-BSN))*10
BSNO2 = ((BS2av-BSn)/(BSX-BSN))*10
BSNO3 = ((BS3av-BSn)/(BSX-BSN))*10
BSNO4 = ((BS4av-BSn)/(BSX-BSN))*10
** [ROOT]
RONO1 = ((RO1L-RON)/(ROX-RON))*10
RONO2 = ((RO2av-RON)/(ROX-RON))*10
RONO3 = ((RO3av-RON)/(ROX-RON))*10
RONO4 = ((RO4av-RON)/(ROX-RON))*10
** [SALINITY]
SANO1 = ((SAL1av-ECN)/(ECX-ECN))*10
SANO2 = ((SAL2av-ECN)/(ECX-ECN))*10
SANO3 = ((SAL3av-ECN)/(ECX-ECN))*10
SANO4 = ((SAL4L-ECN)/(ECX-ECN))*10
** [SLOPE]
SLNO1 = ((SLOP1av-SLN)/(SLX-SLN))
SLNO2 = ((SLOP2av-SLN)/(SLX-SLN))
SLNO3 = ((SLOP3av-SLN)/(SLX-SLN))
SLNO4 = ((SLOP4L-SLN)/(SLX-SLN))*10
ENDI

IF Eva_met_lmu = 'FAO'

DO EUCL_FAO

ELSE

DO EUCL_DLD

ENDI

** Replace data to database **

IF tloop = 1
  sele 6
  appe blank
  repl AREA_ID with m.area
  repl PRAO_ with m.area
  repl crop1 with m.crop
  repl grade1 with ecrop
  repl c1 with S
  repl suit_c1 with s_id
  else
  sele 6
  repl &ferop with m.crop

```

```

repl &fgrade with ecrop
repl &fclass with S
repl &fc_id with s_id
skip
endi
SELECT 1
SKIP
ENDDO .T. && end loop for LMU

```

```

TLOOP = tloop+1
** define field to replace

```

```

FCROP = 'CROP'+ALLTRIM(str(TLOOP))
FGRADE = 'GRADE'+ALLTRIM(str(TLOOP))
fclass = 'C'+ALLTRIM(str(TLOOP))
fc_id = 'SUIT_C'+ALLTRIM(str(TLOOP))

```

```

SELE 6
GO TOP
SELE 2
SKIP
@ 13,20,14,c BOX replicate(chr(178),9)
c = c+b
ENDDO .T. && end loop for LUT

```

```

** Calculate RELATIVE SUIT **

```

```

SET TALK OFF
sele 6
USE ABSOLUTE
GO TOP
DO WHIL .T.
  SE_COU = 0
  SE_COU1 = 0
  SE_COU2 = 0
  IF EOF()
    EXIT
  ENDI
  IF CROP1 = ''
    REPL ALL_CROP WITH 'N'
    REPL FIELD_C WITH 'N'
    REPL TREE WITH 'N'
    REPL HGRADE WITH SE_COU
    skip
    LOOP
  ENDI

```

```

TECROP = GRADE1+GRADE2+GRADE3+GRADE4+;
GRADE5+GRADE6+GRADE7+GRADE8+GRADE9+;
GRADE10+GRADE11+GRADE12+GRADE13+;
GRADE14+GRADE15+GRADE16+GRADE17+;
GRADE18+GRADE19+GRADE20+GRADE21+;
GRADE22+GRADE23+GRADE24+GRADE25+;
GRADE26+GRADE27+GRADE28+GRADE29+;
GRADE30+GRADE31+GRADE32+GRADE33+;
GRADE34

```

```

TECROP1 = GRADE1+GRADE2+GRADE3+GRADE4+;
GRADE5+GRADE6+GRADE7+GRADE8+GRADE9+;
GRADE10+GRADE11+GRADE12+GRADE13
+GRADE14

```

```

TECROP2 = TECROP-TECROP1

```

```

**** ALL CROP ***
IF (GRADE1/TECROP) > (GRADE2/TECROP)
  m.crop = CROP1
  SE_COU = (GRADE1/TECROP)
ELSE
  m.crop = CROP2

```

```

  SE_COU = (GRADE2/TECROP)
ENDI
IF (GRADE3/TECROP) > (SE_COU)
  m.crop = CROP3
  SE_COU = (GRADE3/TECROP)
ENDI
IF (GRADE4/TECROP) > (SE_COU)
  m.crop = CROP4
  SE_COU = (GRADE4/TECROP)
ENDI
IF (GRADE5/TECROP) > (SE_COU)
  m.crop = CROP5
  SE_COU = (GRADE5/TECROP)
ENDI
IF (GRADE6/TECROP) > (SE_COU)
  m.crop = CROP6
  SE_COU = (GRADE6/TECROP)
ENDI
IF (GRADE7/TECROP) > (SE_COU)
  m.crop = CROP7
  SE_COU = (GRADE7/TECROP)
ENDI
IF (GRADE8/TECROP) > (SE_COU)
  m.crop = CROP8
  SE_COU = (GRADE8/TECROP)
ENDI
IF (GRADE9/TECROP) > (SE_COU)
  m.crop = CROP9
  SE_COU = (GRADE9/TECROP)
ENDI
IF (GRADE10/TECROP) > (SE_COU)
  m.crop = CROP10
  SE_COU = (GRADE10/TECROP)
ENDI
IF (GRADE11/TECROP) > (SE_COU)
  m.crop = CROP11
  SE_COU = (GRADE11/TECROP)
ENDI
IF (GRADE12/TECROP) > (SE_COU)
  m.crop = CROP12
  SE_COU = (GRADE12/TECROP)
ENDI
IF (GRADE13/TECROP) > (SE_COU)
  m.crop = CROP13
  SE_COU = (GRADE13/TECROP)
ENDI
IF (GRADE14/TECROP) > (SE_COU)
  m.crop = CROP14
  SE_COU = (GRADE14/TECROP)
ENDI
IF (GRADE15/TECROP) > (SE_COU)
  m.crop = CROP15
  SE_COU = (GRADE15/TECROP)
ENDI
IF (GRADE16/TECROP) > (SE_COU)
  m.crop = CROP16
  SE_COU = (GRADE16/TECROP)
ENDI
IF (GRADE17/TECROP) > (SE_COU)
  m.crop = CROP17
  SE_COU = (GRADE17/TECROP)
ENDI
IF (GRADE18/TECROP) > (SE_COU)
  m.crop = CROP18
  SE_COU = (GRADE18/TECROP)
ENDI
IF (GRADE19/TECROP) > (SE_COU)
  m.crop = CROP19
  SE_COU = (GRADE19/TECROP)
ENDI
IF (GRADE20/TECROP) > (SE_COU)
  m.crop = CROP20

```

```

SE_COU = (GRADE20/TECROP)
ENDI
IF (GRADE21/TECROP) > (SE_COU)
  m.crop = CROP21
  SE_COU = (GRADE21/TECROP)
ENDI
IF (GRADE22/TECROP) > (SE_COU)
  m.crop = CROP22
  SE_COU = (GRADE22/TECROP)
ENDI
IF (GRADE23/TECROP) > (SE_COU)
  m.crop = CROP23
  SE_COU = (GRADE23/TECROP)
ENDI
IF (GRADE24/TECROP) > (SE_COU)
  m.crop = CROP24
  SE_COU = (GRADE24/TECROP)
ENDI
IF (GRADE25/TECROP) > (SE_COU)
  m.crop = CROP25
  SE_COU = (GRADE25/TECROP)
ENDI
IF (GRADE26/TECROP) > (SE_COU)
  m.crop = CROP26
  SE_COU = (GRADE26/TECROP)
ENDI
IF (GRADE27/TECROP) > (SE_COU)
  m.crop = CROP27
  SE_COU = (GRADE27/TECROP)
ENDI
IF (GRADE28/TECROP) > (SE_COU)
  m.crop = CROP28
  SE_COU = (GRADE28/TECROP)
ENDI
IF (GRADE29/TECROP) > (SE_COU)
  m.crop = CROP29
  SE_COU = (GRADE29/TECROP)
ENDI
IF (GRADE30/TECROP) > (SE_COU)
  m.crop = CROP30
  SE_COU = (GRADE30/TECROP)
ENDI
IF (GRADE31/TECROP) > (SE_COU)
  m.crop = CROP31
  SE_COU = (GRADE31/TECROP)
ENDI
IF (GRADE32/TECROP) > (SE_COU)
  m.crop = CROP32
  SE_COU = (GRADE32/TECROP)
ENDI
IF (GRADE33/TECROP) > (SE_COU)
  m.crop = CROP33
  SE_COU = (GRADE33/TECROP)
ENDI
IF (GRADE34/TECROP) > (SE_COU)
  m.crop = CROP34
  SE_COU = (GRADE34/TECROP)
ENDI
*** FIELD_C ***
IF (GRADE1/TECROP1) > (GRADE2/TECROP1)
  m.crop1 = CROP1
  SE_COU1 = (GRADE1/TECROP1)
ELSE
  m.crop1 = CROP2
  SE_COU1 = (GRADE2/TECROP1)
ENDI
IF (GRADE3/TECROP1) > (SE_COU1)
  m.crop1 = CROP3
  SE_COU1 = (GRADE3/TECROP1)
ENDI
IF (GRADE4/TECROP1) > (SE_COU1)
  m.crop1 = CROP4

```

```

SE_COU1 = (GRADE4/TECROP1)
ENDI
IF (GRADE5/TECROP1) > (SE_COU1)
  m.crop1 = CROP5
  SE_COU1 = (GRADE5/TECROP1)
ENDI
IF (GRADE6/TECROP1) > (SE_COU1)
  m.crop1 = CROP6
  SE_COU1 = (GRADE6/TECROP1)
ENDI
IF (GRADE7/TECROP1) > (SE_COU1)
  m.crop1 = CROP7
  SE_COU1 = (GRADE7/TECROP1)
ENDI
IF (GRADE8/TECROP1) > (SE_COU1)
  m.crop1 = CROP8
  SE_COU1 = (GRADE8/TECROP1)
ENDI
IF (GRADE9/TECROP1) > (SE_COU1)
  m.crop1 = CROP9
  SE_COU1 = (GRADE9/TECROP1)
ENDI
IF (GRADE10/TECROP1) > (SE_COU1)
  m.crop1 = CROP10
  SE_COU1 = (GRADE10/TECROP1)
ENDI
IF (GRADE11/TECROP1) > (SE_COU1)
  m.crop1 = CROP11
  SE_COU1 = (GRADE11/TECROP1)
ENDI
IF (GRADE12/TECROP1) > (SE_COU1)
  m.crop1 = CROP12
  SE_COU1 = (GRADE12/TECROP1)
ENDI
IF (GRADE13/TECROP1) > (SE_COU1)
  m.crop1 = CROP13
  SE_COU1 = (GRADE13/TECROP1)
ENDI
IF (GRADE14/TECROP1) > (SE_COU1)
  m.crop1 = CROP14
  SE_COU1 = (GRADE14/TECROP1)
ENDI
*** TREE ***
IF (GRADE15/TECROP2) > (GRADE16/TECROP2)
  m.crop2 = CROP15
  SE_COU2 = (GRADE15/TECROP2)
ELSE
  m.crop2 = CROP16
  SE_COU2 = (GRADE16/TECROP2)
ENDI
IF (GRADE17/TECROP2) > (SE_COU2)
  m.crop2 = CROP17
  SE_COU2 = (GRADE17/TECROP2)
ENDI
IF (GRADE18/TECROP2) > (SE_COU2)
  m.crop2 = CROP18
  SE_COU2 = (GRADE18/TECROP2)
ENDI
IF (GRADE19/TECROP2) > (SE_COU2)
  m.crop2 = CROP19
  SE_COU2 = (GRADE19/TECROP2)
ENDI
IF (GRADE20/TECROP2) > (SE_COU2)
  m.crop2 = CROP20
  SE_COU2 = (GRADE20/TECROP2)
ENDI
IF (GRADE21/TECROP2) > (SE_COU2)
  m.crop2 = CROP21
  SE_COU2 = (GRADE21/TECROP2)
ENDI
IF (GRADE22/TECROP2) > (SE_COU2)
  m.crop2 = CROP22

```

```

SE_COU2 = (GRADE22/TECROP2)
ENDI
IF (GRADE23/TECROP2) > (SE_COU2)
  m.crop2 = CROP23
  SE_COU2 = (GRADE23/TECROP2)
ENDI
IF (GRADE24/TECROP2) > (SE_COU2)
  m.crop2 = CROP24
  SE_COU2 = (GRADE24/TECROP2)
ENDI
IF (GRADE25/TECROP2) > (SE_COU2)
  m.crop2 = CROP25
  SE_COU2 = (GRADE25/TECROP2)
ENDI
IF (GRADE26/TECROP2) > (SE_COU2)
  m.crop2 = CROP26
  SE_COU2 = (GRADE26/TECROP2)
ENDI
IF (GRADE27/TECROP2) > (SE_COU2)
  m.crop2 = CROP27
  SE_COU2 = (GRADE27/TECROP2)
ENDI
IF (GRADE28/TECROP2) > (SE_COU2)
  m.crop2 = CROP28
  SE_COU2 = (GRADE28/TECROP2)
ENDI
IF (GRADE29/TECROP2) > (SE_COU2)
  m.crop2 = CROP29
  SE_COU2 = (GRADE29/TECROP2)
ENDI
IF (GRADE30/TECROP2) > (SE_COU2)
  m.crop2 = CROP30
  SE_COU2 = (GRADE30/TECROP2)
ENDI
IF (GRADE31/TECROP2) > (SE_COU2)
  m.crop2 = CROP31
  SE_COU2 = (GRADE31/TECROP2)
ENDI
IF (GRADE32/TECROP2) > (SE_COU2)
  m.crop2 = CROP32
  SE_COU2 = (GRADE32/TECROP2)
ENDI
IF (GRADE33/TECROP2) > (SE_COU2)
  m.crop2 = CROP33
  SE_COU2 = (GRADE33/TECROP2)
ENDI
IF (GRADE34/TECROP2) > (SE_COU2)
  m.crop2 = CROP34
  SE_COU2 = (GRADE34/TECROP2)
ENDI

```

```

REPL ALL_CROP WITH M.CROP
REPL FIELD_C WITH M.CROP1
REPL TREE WITH M.CROP2
REPL HGRADE WITH SE_COU
skip
ENDDO

```

```

*** define DATA will be copy ***

```

```

ZZ = "
ZZ1 = "
A = 1
DO WHILE A < R_COUNT+1
  T = ALLTRIM(STR(A))
  IF A = R_COUNT
    ZZ = ZZ+'C'+T
    ZZ1 = ZZ1+'SUIT_C'+T
  ELSE
    ZZ = ZZ+'C'+T+' '
    ZZ1 = ZZ1+'SUIT_C'+T+' '
  ENDI
  A = A+1

```

```

ENDD
SELE 6
IF Eva_met_Imu = 'FAO'

  ERASE WANG_F.DBF
  ERASE WANG_F1.DBF

  TCOPY = 'COPY TO WANG_F FIELDS ;
  AREA_ID,PRAO_,'+ZZ

  TCOPY1 = 'COPY TO WANG_F1 FIELDS ;
  AREA_ID,PRAO_,ALL_CROP,FIELD_C,TREE,;
  HGRADE,'+ZZ1

ELSE

  ERASE WANG_D.DBF
  ERASE WANG_D1.DBF

  TCOPY = 'COPY TO WANG_D FIELDS ;
  AREA_ID,PRAO_,'+ZZ

  TCOPY1 = 'COPY TO WANG_D1 FIELDS ;
  AREA_ID,PRAO_,ALL_CROP,FIELD_C,TREE,;
  HGRADE,'+ZZ1

ENDI
&TCOPY1
&TCOPY
IF Eva_met_Imu = 'FAO'
@ 17,15 SAY ' The result of Evaluation file Saved in'
@ 18,25 SAY ' WANG_F and WANG_F1 '
ELSE
@ 17,15 SAY ' The result of Evaluation file Saved in'
@ 18,25 SAY ' WANG_D and WANG_D1 '
ENDI

```

```

***** END *****

```

```

** Procedure DEF_VAL1 **

```

```

PROCEDURE DEF_VAL1
PUBLIC DRNOR,ROCKNOR,STONENOR,ROPENOR

```

```

DO CASE
CASE M.DRAIN $ DR1
  DRNOR = 8
CASE M.DRAIN $ DR2
  DRNOR = 6
CASE M.DRAIN $ DR3
  DRNOR = 4
CASE M.DRAIN $ DR4
  DRNOR = 2
ENDCASE

```

```

DO CASE
CASE M.ROCK <= VAL(ROCK1)
  ROCKNOR = 8
CASE M.ROCK = VAL(ROCK2)
  ROCKNOR = 6
CASE M.ROCK = VAL(ROCK3)
  ROCKNOR = 4
CASE M.ROCK = VAL(ROCK4)
  ROCKNOR = 2
ENDCASE

```

```
DO CASE
  CASE M.STONE <= VAL(STONE1)
    STONENOR = 8
  CASE M.STONE = VAL(STONE2)
    STONENOR = 6
  CASE M.STONE = VAL(STONE3)
    STONENOR = 4
  CASE M.STONE = VAL(STONE4)
    STONENOR = 2
ENDCASE
```

```
DO CASE
  CASE M.ROOT_PE <= ROOT_PE1
    ROPENOR = 8
  CASE M.ROOT_PE = ROOT_PE2
    ROPENOR = 6
  CASE M.ROOT_PE = ROOT_PE3
    ROPENOR = 4
  CASE M.ROOT_PE = ROOT_PE4
    ROPENOR = 2
ENDCASE
```

```
RETURN
```

```
** Procedure DEF_VAL **
```

```
PROCEDURE DEF_VAL
```

```
DO CASE
  CASE ALLTRIM(UPPER(SUBS_CEC)) = 'VH'
    SUB_CEC = 10
  CASE ALLTRIM(UPPER(SUBS_CEC)) = 'H'
    SUB_CEC = 8
  CASE ALLTRIM(UPPER(SUBS_CEC)) = 'M'
    SUB_CEC = 6
  CASE ALLTRIM(UPPER(SUBS_CEC)) = 'L'
    SUB_CEC = 4
  CASE ALLTRIM(UPPER(SUBS_CEC)) = 'VL'
    SUB_CEC = 2
ENDCASE
```

```
DO CASE
  CASE ALLTRIM(UPPER(TOPS_P)) = 'VH'
    TOP_P = 10
  CASE ALLTRIM(UPPER(TOPS_P)) = 'H'
    TOP_P = 8
  CASE ALLTRIM(UPPER(TOPS_P)) = 'M'
    TOP_P = 6
  CASE ALLTRIM(UPPER(TOPS_P)) = 'L'
    TOP_P = 4
  CASE ALLTRIM(UPPER(TOPS_P)) = 'VL'
    TOP_P = 2
ENDCASE
```

```
DO CASE
  CASE ALLTRIM(UPPER(TOPS_K)) = 'VH'
    TOP_K = 10
  CASE ALLTRIM(UPPER(TOPS_K)) = 'H'
    TOP_K = 8
  CASE ALLTRIM(UPPER(TOPS_K)) = 'M'
    TOP_K = 6
  CASE ALLTRIM(UPPER(TOPS_K)) = 'L'
    TOP_K = 4
  CASE ALLTRIM(UPPER(TOPS_K)) = 'VL'
    TOP_K = 2
ENDCASE
```

```
DRNOR = 2
TENOR = 2
```

```
DO CASE
  CASE M.DRAIN $ DRNO1C
    DRNOR = 8
  CASE M.DRAIN $ DRNO2C
    DRNOR = 6
  CASE M.DRAIN $ DRNO3C
    DRNOR = 4
  CASE M.DRAIN $ DRNO4C
    DRNOR = 2
ENDCASE
```

```
DO CASE
  CASE M.TEXT $ TENO1C
    TENOR = 8
  CASE M.TEXT $ TENO2C
    TENOR = 6
  CASE M.TEXT $ TENO3C
    TENOR = 4
  CASE M.TEXT $ TENO4C
    TENOR = 2
ENDCASE
RETURN
```

```
** PROCEDURE CONSTANT **
** Define constant **
** Maximum & Minimum **
```

```
PROCEDURE constant
```

```
** Temperature CONSTANT
```

```
TX = 40
TN = 0
```

```
** RAINFALL
```

```
RAX = 4000
RAN = 0
```

```
** ROOT DEPTH
```

```
ROX = 200
RON = 0
```

```
** CEC
```

```
CECX = 10
CECN = 0
```

```
** pH
```

```
PHX = 14
PHN = 0
```

```
** PHOSPORUS
```

```
PX = 10
PN = 2
```

```
** K POTASSIUM
```

```
KX = 10
KN = 2
```

```
** SALINITY
```

```
SAX = 30
SAN = 0
```

```
** SLOPE
```

```
SLX = 50
SLN = 0
```

```
** phos_dld
```

```
Pdx = 45
Pdn = 0
```

```
** potas_dld
```

```
Kdx = 100
Kdn = 0
```

```
** Orga-dld
```

```
* ORGx = 4.5
ORGx = 100
ORGn = 0
```

```
** cec-dld
```

```
CECdx = 30
CECdn = 0
```

```
** basesaturation
```

```
BSx = 100
BSn = 0
```

```
** EC_dld
```

```
ECx = 30
```

```
ECn = 0
RETURN
```

```
** PROCEDURE TO CALCULATE **
** EUCLIDIAN DISTANCE **
** FOR LUR DEFINED BY FAO **
```

```
PROCEDURE EUCL_FAO
PUBLIC S,S_ID,ECROP
```

```
***** S1 *****
```

```
TS1 = (TNOR-TSNO1)^2
RAS1 = (RANOR-RANO1)^2
DRAS1 = (DRNOR-DRNO1)^2
TEXTS1 = (TENOR-TENO1)^2
ROS1 = (RONOR-RONO1)^2
PHS1 = (PHNOR-PHNO1)^2
SALS1 = (SANOR-SANO1)^2
SLS1 = (SLNOR-SLNO1)^2
```

```
IF CECNO1 = 0
```

```
CECS1 = 0
```

```
ELSE
```

```
CECS1 = (CECNOR-CECNO1)^2
```

```
ENDI
```

```
IF PNO1 = 0
```

```
PS1 = 0
```

```
ELSE
```

```
PS1 = (PNOR-PNO1)^2
```

```
ENDI
```

```
IF KNO1 = 0
```

```
KS1 = 0
```

```
ELSE
```

```
KS1 = (KNOR-KNO1)^2
```

```
ENDI
```

```
E1 = SQRT(TS1+RAS1+DRAS1+TEXTS1+ROS1+
PHS1+SALS1+SLS1+CECS1+PS1+KS1)
```

```
***** S2 *****
```

```
TS2 = (TNOR-TSNO2)^2
RAS2 = (RANOR-RANO2)^2
DRAS2 = (DRNOR-DRNO2)^2
TEXTS2 = (TENOR-TENO2)^2
ROS2 = (RONOR-RONO2)^2
PHS2 = (PHNOR-PHNO2)^2
SALS2 = (SANOR-SANO2)^2
SLS2 = (SLNOR-SLNO2)^2
```

```
IF CECNO2 = 0
```

```
CECS2 = 0
```

```
ELSE
```

```
CECS2 = (CECNOR-CECNO2)^2
```

```
ENDI
```

```
IF PNO2 = 0
```

```
PS2 = 0
```

```
ELSE
```

```
PS2 = (PNOR-PNO2)^2
```

```
ENDI
```

```
IF KNO2 = 0
```

```
KS2 = 0
```

```
ELSE
```

```
KS2 = (KNOR-KNO2)^2
```

```
ENDI
```

```
E2 = SQRT(TS2+RAS2+DRAS2+TEXTS2+ROS2+
PHS2+SALS2+SLS2+CECS2+PS2+KS2)
```

```
***** S3 *****
```

```
TS3 = (TNOR-TSNO3)^2
RAS3 = (RANOR-RANO3)^2
DRAS3 = (DRNOR-DRNO3)^2
TEXTS3 = (TENOR-TENO3)^2
ROS3 = (RONOR-RONO3)^2
PHS3 = (PHNOR-PHNO3)^2
SALS3 = (SANOR-SANO3)^2
SLS3 = (SLNOR-SLNO3)^2
```

```
IF CECNO3 = 0
```

```
CECS3 = 0
```

```
ELSE
```

```
CECS3 = (CECNOR-CECNO3)^2
```

```
ENDI
```

```
IF PNO3 = 0
```

```
PS3 = 0
```

```
ELSE
```

```
PS3 = (PNOR-PNO3)^2
```

```
ENDI
```

```
IF KNO3 = 0
```

```
KS3 = 0
```

```
ELSE
```

```
KS3 = (KNOR-KNO3)^2
```

```
ENDI
```

```
E3 = SQRT(TS3+RAS3+DRAS3+TEXTS3+ROS3+
PHS3+SALS3+SLS3+CECS3+PS3+KS3)
```

```
***** S4 *****
```

```
TS4 = (TNOR-TSNO4)^2
```

```
RAS4 = (RANOR-RANO4)^2
```

```
DRAS4 = (DRNOR-DRNO4)^2
```

```
TEXTS4 = (TENOR-TENO4)^2
```

```
ROS4 = (RONOR-RONO4)^2
```

```
PHS4 = (PHNOR-PHNO4)^2
```

```
SALS4 = (SANOR-SANO4)^2
```

```
SLS4 = (SLNOR-SLNO4)^2
```

```
IF CECNO4 = 0
```

```
CECS4 = 0
```

```
ELSE
```

```
CECS4 = (CECNOR-CECNO4)^2
```

```
ENDI
```

```
IF PNO4 = 0
```

```
PS4 = 0
```

```
ELSE
```

```
PS4 = (PNOR-PNO4)^2
```

```
ENDI
```

```
IF KNO4 = 0
```

```
KS4 = 0
```

```
ELSE
```

```
KS4 = (KNOR-KNO4)^2
```

```
ENDI
```

```
E4 = SQRT(TS4+RAS4+DRAS4+TEXTS4+ROS4+
PHS4+SALS4+SLS4+CECS4+PS4+KS4)
```

```
TWE = (1/E1)+(1/E2)+(1/E3)+(1/E4)
```

```
SSW = 0
```

```
ECROP = 0
```

```
***
```

```
SS1 = (1/E1)/TWE
```

```
SS2 = (1/E2)/TWE
```

```
SS3 = (1/E3)/TWE
```

```
SS4 = (1/E4)/TWE
```

```
ECROP = 1/E1
```

```
** Define value for suitability **
```

```
IF SS1 > SS2
```

```
S = 'S1'
```

```
s_id = 1 && for idrisi
```

```
SSW = SS1
```

```
ELSE
```

```
SSW = SS2
```

```
S = 'S2'
```

```
s_id = 2
```

```
ENDIF
```

```
IF SSW < SS3
```

```
S = 'S3'
```

```
s_id = 3
```

```
SSW = SS3
```

```
ENDIF
```

```
IF SSW < SS4
```

```

S = 'N'
s_id = 4
SSW = SS4
ENDIF

```

```
RETURN
```

```

** PROCEDURE TO CALCULATE **
** EUCLIDIAN DISTANCE **
** FOR LUR DEFINED BY DLD **

```

```

PROCEDURE EUCL_DLD
PUBLIC S,S_ID,ECROP

```

```
***** S1 *****
```

```

E1 = SQRT((TNOR-TSNO1)^2+(PHNOR-PHNO1)^2+;
(RANOR-RANO1)^2+(PNOR-PNO1)^2+;
(KNOR-KNO1)^2+(ORGNO-ORGNO1)^2+;
(CECNOR-CECNO1)^2+(BSNOR-BSNO1)^2+;
(RONOR-RONO1)^2+(SANOR-SANO1)^2+;
(SLNOR-SLNO1)^2+(DRNOR-8)^2+;
(STONENOR-8)^2+(ROCKNOR-8)^2+;
(ROPENOR-8)^2)

```

```
***** S2 *****
```

```

E2 = SQRT((TNOR-TSNO2)^2+(PHNOR-PHNO2)^2+;
(RANOR-RANO2)^2+(PNOR-PNO2)^2+;
(KNOR-KNO2)^2+(ORGNO-ORGNO2)^2+;
(CECNOR-CECNO2)^2+(BSNOR-BSNO2)^2+;
(RONOR-RONO2)^2+(SANOR-SANO2)^2+;
(SLNOR-SLNO2)^2+(DRNOR-6)^2+;
(STONENOR-6)^2+(ROCKNOR-6)^2+;
(ROPENOR-6)^2)

```

```
***** S3 *****
```

```

E3 = SQRT((TNOR-TSNO3)^2+(PHNOR-PHNO3)^2+;
(RANOR-RANO3)^2+(PNOR-PNO3)^2+;
(KNOR-KNO3)^2+(ORGNO-ORGNO3)^2+;
(CECNOR-CECNO3)^2+(BSNOR-BSNO3)^2+;
(RONOR-RONO3)^2+(SANOR-SANO3)^2+;
(SLNOR-SLNO3)^2+(DRNOR-4)^2+;
(STONENOR-4)^2+(ROCKNOR-4)^2+;
(ROPENOR-4)^2)

```

```
***** S4 *****
```

```

E4 = SQRT((TNOR-TSNO4)^2+(PHNOR-PHNO4)^2+;
(RANOR-RANO4)^2+(PNOR-PNO4)^2+;

```

```

(KNOR-KNO4)^2+(ORGNO-ORGNO4)^2+;
(CECNOR-CECNO4)^2+(BSNOR-BSNO4)^2+;
(RONOR-RONO4)^2+(SANOR-SANO4)^2+;
(SLNOR-SLNO4)^2+(DRNOR-2)^2+;
(STONENOR-2)^2+(ROCKNOR-2)^2+;
(ROPENOR-2)^2)

```

```
TWE = (1/E1)+(1/E2)+(1/E3)+(1/E4)
```

```
SSW = 0
```

```
ECROP = 0
```

```
***
```

```
SS1 = (1/E1)/TWE
```

```
SS2 = (1/E2)/TWE
```

```
SS3 = (1/E3)/TWE
```

```
SS4 = (1/E4)/TWE
```

```
ECROP = 1/E1
```

```
** Define value for suitability **
```

```
IF SS1 > SS2
```

```
S = 'S1'
```

```
s_id = 1 && for idrisi
```

```
SSW = SS1
```

```
ELSE
```

```
SSW = SS2
```

```
S = 'S2'
```

```
s_id = 2
```

```
ENDIF
```

```
IF SSW < SS3
```

```
S = 'S3'
```

```
s_id = 3
```

```
SSW = SS3
```

```
ENDIF
```

```
IF SSW < SS4
```

```
S = 'N'
```

```
s_id = 4
```

```
SSW = SS4
```

```
ENDIF
```

```
RETURN
```

```
**** END PROCEDURE ***
```


Appendix Table 28. Maximum and minimum values of soil characteristics for calculating membership grades by Fuzzy land evaluation method.

Characteristic	Temp (°c)	Rain (mm)	Root_dep (cm)	CEC (me/100 g.soil)	pH	P	K	Salinity (mmhos/cm)	Slope (%)
Maximum	40	4000	300	10	14	10	10	30	50
Minimum	0	0	0	0	0	2	2	0	0

Appendix Table 29. File structure of EVALUATE.DBF.

Structure for database : D:\SIRICHAILAND_EVA\EVALUATE.DBF

Number of data records : 973

Date of last update : 04/20/93

Field Field Name Type Width Dec Index

1	AREA	Numeric	13			30	GRADE6	Numeric	10	4
2	ALL_CROP	Character	32			31	C6	Character	5	
3	FIELD_C	Character	32			32	SUIT_C6	Numeric	3	
4	TREE	Character	32			33	CROP7	Character	32	
5	AL	Numeric	4			34	GRADE7	Numeric	10	4
6	FC	Numeric	4			35	C7	Character	5	
7	TR	Numeric	4			36	SUIT_C7	Numeric	3	
8	HGRADE	Numeric	10	4		37	CROP8	Character	32	
9	CROP1	Character	32			38	GRADE8	Numeric	10	4
10	GRADE1	Numeric	10	4		39	C8	Character	5	
11	C1	Character	5			40	SUIT_C8	Numeric	3	
12	SUIT_C1	Numeric	3			41	CROP9	Character	32	
13	CROP2	Character	32			42	GRADE9	Numeric	10	4
14	GRADE2	Numeric	10	4		43	C9	Character	5	
15	C2	Character	5			44	SUIT_C9	Numeric	3	
16	SUIT_C2	Numeric	3			45	CROP10	Character	32	
17	CROP3	Character	32			46	GRADE10	Numeric	10	4
18	GRADE3	Numeric	10	4		47	C10	Character	5	
19	C3	Character	5			48	SUIT_C10	Numeric	3	
20	SUIT_C3	Numeric	3			49	CROP11	Character	32	
21	CROP4	Character	32			50	GRADE11	Numeric	10	4
22	GRADE4	Numeric	10	4		51	C11	Character	5	
23	C4	Character	5			52	SUIT_C11	Numeric	3	
24	SUIT_C4	Numeric	3			53	CROP12	Character	32	
25	CROP5	Character	32			54	GRADE12	Numeric	10	4
26	GRADE5	Numeric	10	4		55	C12	Character	5	
27	C5	Character	5			56	SUIT_C12	Numeric	3	
28	SUIT_C5	Numeric	3			57	CROP13	Character	32	
29	CROP6	Character	32			58	GRADE13	Numeric	10	4

59	C13	Character	5		132	SUIT_C31	Numeric	3		
60	SUIT_C13	Numeric	3		133	CROP32	Character	32		
61	CROP14	Character	32		134	GRADE32	Numeric	10	4	
62	GRADE14	Numeric	10	4	135	C32	Character	5		
63	C14	Character	5		136	SUIT_C32	Numeric	3		
64	SUIT_C14	Numeric	3		137	CROP33	Character	32		
65	CROP15	Character	32		138	GRADE33	Numeric	10	4	
66	GRADE15	Numeric	10	4	139	C33	Character	5		
67	C15	Character	5		140	SUIT_C33	Numeric	3		
68	SUIT_C15	Numeric	3		141	CROP34	Character	32		
69	CROP16	Character	32		142	GRADE34	Numeric	10	4	
70	GRADE16	Numeric	10	4	143	C34	Character	5		
71	C16	Character	5		144	SUIT_C34	Numeric	3		
72	SUIT_C16	Numeric	3		** Total **				1832	
73	CROP17	Character	32							
74	GRADE17	Numeric	10	4						
75	C17	Character	5							
76	SUIT_C17	Numeric	3							
77	CROP18	Character	32							
78	GRADE18	Numeric	10	4						
79	C18	Character	5							
80	SUIT_C18	Numeric	3							
81	CROP19	Character	32							
82	GRADE19	Numeric	10	4						
83	C19	Character	5							
84	SUIT_C19	Numeric	3							
85	CROP20	Character	32							
86	GRADE20	Numeric	10	4						
87	C20	Character	5							
88	SUIT_C20	Numeric	3							
89	CROP21	Character	32							
90	GRADE21	Numeric	10	4						
91	C21	Character	5							
92	SUIT_C21	Numeric	3							
93	CROP22	Character	32							
94	GRADE22	Numeric	10	4						
95	C22	Character	5							
96	SUIT_C22	Numeric	3							
97	CROP23	Character	32							
98	GRADE23	Numeric	10	4						
99	C23	Character	5							
100	SUIT_C23	Numeric	3							
101	CROP24	Character	32							
102	GRADE24	Numeric	10	4						
103	C24	Character	5							
104	SUIT_C24	Numeric	10	4						
123	C29	Character	5							
124	SUIT_C29	Numeric	3							
125	CROP30	Character	32							
126	GRADE30	Numeric	10	4						
127	C30	Character	5							
128	SUIT_C30	Numeric	3							
129	CROP31	Character	32							
130	GRADE31	Numeric	10	4						
131	C31	Character	5							

Appendix Table 30. File structure of WANG_F.DBF.

Structure for database : D:\SIRICHAILAND_EVA\WANG_F.DBF
 Number of data records : 973
 Date of last update : 10/11/93

Field	Field Name	Type	Width	Dec	Index
1	AREA_ID	Numeric	13		
2	PRAO_	Character	11		
3	C1	Character	20		
4	C2	Character	20		
5	C3	Character	20		
6	C4	Character	20		
7	C5	Character	20		
8	C6	Character	20		
9	C7	Character	20		
** Total **			165		

Appendix Table 31. File structure of WANG_F1.DBF.

Structure for database : D:\SIRICHAILAND_EVA\WANG_F1.DBF
 Number of data records : 973
 Date of last update : 10/11/93

Field	Field Name	Type	Width	Dec	Index
1	AREA_ID	Numeric	13		
2	PRAO_	Character	11		
3	ALL_CROP	Character	32		
4	FIELD_C	Character	32		
5	TREE	Character	32		
6	HGRADE	Numeric	10	4	
7	SUIT_C1	Numeric	3		
8	SUIT_C2	Numeric	3		
9	SUIT_C3	Numeric	3		
10	SUIT_C4	Numeric	3		
11	SUIT_C5	Numeric	3		
12	SUIT_C6	Numeric	3		
13	SUIT_C7	Numeric	3		
** Total **			152		

Appendix Table 32. File structure of WANG_D.DBF.

Structure for database : D:\SIRICHAILAND_EVA\WANG_D.DBF

Number of data records : 973

Date of last update : 10/11/93

Field	Field Name	Type	Width	Dec	Index
1	AREA_ID	Numeric	13		
2	PRAO_	Character	11		
3	C1	Character	20		
4	C2	Character	20		
5	C3	Character	20		
6	C4	Character	20		
7	C5	Character	20		
8	C6	Character	20		
9	C7	Character	20		
** Total **			165		

Appendix Table 33. File structure of WANG_D1.DBF.

Structure for database : D:\SIRICHAILAND_EVA\WANG_D1.DBF

Number of data records : 973

Date of last update : 10/11/93

Field	Field Name	Type	Width	Dec	Index
1	AREA_ID	Numeric	13		
2	PRAO_	Character	11		
3	ALL_CROP	Character	32		
4	FIELD_C	Character	32		
5	TREE	Character	32		
6	HGRADE	Numeric	10	4	
7	SUIT_C1	Numeric	3		
8	SUIT_C2	Numeric	3		
9	SUIT_C3	Numeric	3		
10	SUIT_C4	Numeric	3		
11	SUIT_C5	Numeric	3		
12	SUIT_C6	Numeric	3		
13	SUIT_C7	Numeric	3		
** Total **			152		

Appendix Table 34. Program listing of EVALUATE.PRG to calculate suitability class by Law of Minimum, Multiplication, and Modified Multiplication methods.

```
PROGRAM to CALCULATE
SUITABILITY by Law of Minimum method,
Multiplication and Modified Multiplication methods
4 databases will be used
LUR ( Land Use Requirement, LUR)
LMU ( Land mapping unit, LMU )
LUT ( Land Utilization Type, LUT )
LC ( Land Characteristic, LC )
DATA WILL BE CALCULATED TO PRODUCE
SUITABILITY CLASS for FAO framework
```

```
** Definition of variables **
*m.crop = crop name;
*S_TOTAL = total value of suitability class;
*S_SLOP = suitability value of slope;
*S_RAIN = suitability value of rainfall;
*S_TEMP = suitability value of temperature;
*S_ROOT = suitability value of root depth;
*S_PH = suitability value of pH;
*S_SALE = suitability value of salinity;
*S_DR = suitability value of drainage;
*S_TE = suitability value of texture;
*S_CEC = suitability value of CEC;
*S_P = suitability value of phosphorous;
*S_K = suitability value of potassium;
```

```
clea
SET TALK OFF
CLOS ALL
CLEA ALL
SET SAFETY OFF
SET DECIMALS TO 4
publ Eva_met_lmu,Evaluat,eva_name
clear
CHOICE1 = 0
CHOICE2 = 0

DO while .T.

@ 10,10 say 'Please select Land use requirement from
(1=DLD, 2=FAO)' get choice1
read
@ 13,10 say 'Please select Land Evaluation method'
@ 15,10 say '1. Law of Minimum (1)'
@ 16,10 say '2. Modified Multiplication method(ITC) (2)'
@ 17,10 SAY '3. Multiplication method (DLD) (3)'
get choice2
READ
if choice1 = 1 or choice1 = 2 and choice2 > 0 and choice2 <
4
exit
endi
@ 11,50 say 'Please key number 1 or 2'
@ 18,50 say 'Please key number 1 to 3'
endd

@ 10,10 CLEAR TO 19,80

if choice1 = 1
Eva_met_lmu = 'DLD'
else
Eva_met_lmu = 'FAO'
endi
```

```
Do case
case choice2 = 1
Evaluat = 'L_MIN'
eva_name = "Law of Minimum"
case choice2 = 2
Evaluat = 'ITC'
eva_name = "ITC"
case choice2 = 3
Evaluat = 'DLD'
eva_name = "DLD"
ENDC

PUBL S_TOTAL,S_SLOP,S_RAIN,S_TEMP,S_ROOT,;
S_PH,S_SALE,S_DR,S_TE,S_CEC,S_P,S_K,;
I_CALI_N,I_CALI,I_N1,RRR,M.DRAIN,;
M.SLOPE,M.SAL,M.RAIN,M.ROOT,M.TEMP,;
M.PH,M.TEXT,M.CEC,M.P,M.K,M.ORG,;
M.BS,M.ROCK,M.STONE,M.ROOT_PE,Evaluat,;
Eva_met_lmu

SELECT 6
USE EVALUATE
ZAP

SELECT 4
USE LC
set order to tag soil_id

SELECT 3
USE LUR
go top

SELECT 1
USE LMU
set rela to soil_id into LC
A_count = recc()
go top

SELECT 2
USE LUT
R_count = recc()
go top
tloop = 1
b = 40 / (R_count*2)
c = 20 + b
** value for idrisi soil_id = 66 and < 1
svid66 = 4
svid0 = 0

IF EOF()
@ 10,18 say 'CROP file does not exist;
select to process.'
ELSE
@ 10,20 say "NOW ! process "+eva_name+" Evaluation
method;"
@ 11,25 say "by "+Eva_met_lmu+" Land characteristics"
@ 12,19,15,61 box
ENDI
```

```
** loop DEF_LUR **
```

```
DO WHILE .T.
IF EOF()
```

```

EXIT
ENDI
M.CROP = ALLTRIM(UPPER(CROP))
SELECT 3
GO TOP

```

```

if Eva_met_lmu = 'FAO'
DO LUR_FAO
else
DO LUR_DLD
endi

```

```

** CALCULATE SUITABILITY OF EACH LMU **

```

```

select 1
go top
DO WHILE .T.
if eof()
exit
endi
IF recno() = INT((A_count/2))
@ 13,20,14,c BOX replicate(chr(178),9)
c = c+b
ENDI
M.AREA = PRAO_
IF SOIL_ID < 1
IF tloop = 1
sele 6
appe blank
repl AREA_ID with m.area
repl PRAO_ with m.area
repl crop1 with m.crop
repl grade1 with 0
repl c1 with m.crop
repl suit_c1 with svid0
else
sele 6
repl &fcrop with ''
repl &fgrade with 0
repl &fclass with m.crop
repl &fc_id with svid0
skip
endi
SELECT 1
skip
loop
ENDI
IF SOIL_ID = 66
IF tloop = 1
sele 6
appe blank
repl AREA_ID with m.area
repl PRAO_ with m.area
repl crop1 with ''
repl grade1 with 0
repl c1 with 'N'
repl suit_c1 with svid66
else
sele 6
repl &fcrop with ''
repl &fgrade with 0
repl &fclass with 'N'
repl &fc_id with svid66
skip
endi
SELECT 1
skip
loop
ENDI

```

```

if Eva_met_lmu = 'FAO'
DO LC_F
else
DO LC_D
endi

```

```

** Procedure DEF_VAL **

```

```

DO CASE
CASE M.DRAIN $ DR1
S_DR = 1.0
CASE M.DRAIN $ DR2
S_DR = .8
CASE M.DRAIN $ DR3
S_DR = .5
CASE M.DRAIN $ DR4
S_DR = 0
ENDCASE

```

```

DO CASE
CASE M.SLOPE >= SLOP4L
S_SLOP = 0
CASE M.SLOPE >= SLOP3L AND M.SLOPE <=
SLOP3U
S_SLOP = 0.5
CASE M.SLOPE >= SLOP2L AND M.SLOPE <=
SLOP2U
S_SLOP = 0.8
CASE M.SLOPE >= SLOP1L AND M.SLOPE <=
SLOP1U
S_SLOP = 1
ENDCASE

```

```

DO CASE
CASE M.SAL >= SAL4L
S_SALE = 0
CASE M.SAL >= SAL3L AND M.SAL <= SAL3U
S_SALE = 0.5
CASE M.SAL >= SAL2L AND M.SAL <= SAL2U
S_SALE = 0.8
CASE M.SAL >= SAL1L AND M.SAL <= SAL1U
S_SALE = 1
ENDCASE

```

```

DO CASE
CASE M.RAIN >= RA1L
S_RAIN = 1
CASE M.RAIN >= RA2L AND M.RAIN <= RA2U
S_RAIN = 0.8
CASE M.RAIN >= RA3L AND M.RAIN <= RA3U
S_RAIN = 0.5
CASE M.RAIN >= RA4U
S_RAIN = 0
ENDCASE

```

```

DO CASE
CASE M.ROOT >= RO1L
S_ROOT = 1
CASE M.ROOT >= RO2L AND M.ROOT < RO2U
S_ROOT = 0.8
CASE M.ROOT >= RO3L AND M.ROOT < RO3U
S_ROOT = 0.5
CASE M.ROOT >= RO4U
S_ROOT = 0
ENDCASE

```

```

DO CASE
CASE M.TEMP >= T1LH AND M.TEMP <= T1UH
S_TEMP = 1
CASE M.TEMP >= T2LL AND M.TEMP <= T2UL OR;

```

```

M.TEMP >= T2LH AND M.TEMP <= T2UH
S_TEMP = 0.8
CASE M.TEMP >= T3LL AND M.TEMP <= T3UL OR;
M.TEMP >= T3LH AND M.TEMP <= T3UH
S_TEMP = 0.5
CASE M.TEMP >= T4LH OR M.TEMP <= T4UL
S_TEMP = 0
ENDCASE

DO CASE
CASE M.PH >= PH1LH AND M.PH <= PH1UH
S_PH = 1
CASE M.PH >= PH2LL AND M.PH <= PH2UL OR;
M.PH >= PH2LH AND M.PH <= PH2UH
S_PH = 0.8
CASE M.PH >= PH3LL AND M.PH <= PH3UL OR;
M.PH >= PH3LH AND M.PH <= PH3UH
S_PH = 0.5
CASE M.PH >= PH4LH OR M.PH <= PH4UL
S_PH = 0
ENDCASE

IF Eva_met_lmu = 'FAO'
DO CASE
CASE M.TEXT $ TE1
S_TE = 1
CASE M.TEXT $ TE2
S_TE = 0.8
CASE M.TEXT $ TE3
S_TE = 0.5
CASE M.TEXT $ TE4
S_TE = 0
ENDCASE

DO CASE
CASE M.CEC $ CEC1
S_CEC = 1.0
CASE M.CEC $ CEC2
S_CEC = .8
CASE M.CEC $ CEC3
S_CEC = .5
CASE M.CEC $ CEC4
S_CEC = 0
ENDCASE

DO CASE
CASE M.P $ P1
S_P = 1
CASE M.P $ P2
S_P = 0.8
CASE M.P $ P3
S_P = 0.5
CASE M.P $ P4
S_P = 0
ENDCASE

DO CASE
CASE M.K $ K1
S_K = 1
CASE M.K $ K2
S_K = 0.8
CASE M.K $ K3
S_K = 0.5
CASE M.K $ K4
S_K = 0
ENDCASE

ELSE
DO CASE
CASE M.P >= P1L
S_P = 1
CASE M.P >= P2L AND M.P < P2U
S_P = 0.8
CASE M.P >= P3L AND M.P < P3U
S_P = 0.5
CASE M.P >= P4U
S_P = 0
ENDCASE

DO CASE
CASE M.K >= K1L
S_K = 1
CASE M.K >= K2L AND M.K < K2U
S_K = 0.8
CASE M.K >= K3L AND M.K < K3U
S_K = 0.5
CASE M.K >= K4U
S_K = 0
ENDCASE

DO CASE
CASE M.ORG >= OR1L
S_ORG = 1
CASE M.ORG >= OR2L AND M.ORG < OR2U
S_ORG = 0.8
CASE M.ORG >= OR3L AND M.ORG < OR3U
S_ORG = 0.5
CASE M.ORG >= OR4U
S_ORG = 0
ENDCASE

DO CASE
CASE M.CEC >= CEC1L
S_CEC = 1
CASE M.CEC >= CEC2L AND M.CEC < CEC2U
S_CEC = 0.8
CASE M.CEC >= CEC3L AND M.CEC < CEC3U
S_CEC = 0.5
CASE M.CEC >= CEC4U
S_CEC = 0
ENDCASE

DO CASE
CASE M.BS >= BS1L
S_BS = 1
CASE M.BS >= BS2L AND M.BS < BS2U
S_BS = 0.8
CASE M.BS >= BS3L AND M.BS < BS3U
S_BS = 0.5
CASE M.BS >= BS4U
S_BS = 0
ENDCASE

DO CASE
CASE M.ROCK = 'NONE' OR M.ROCK = '1' OR
M.ROCK = ''
S_ROCK = 1
CASE M.ROCK = '2'
S_ROCK = 0.8
CASE M.ROCK = '3'
S_ROCK = 0.5
CASE M.ROCK = '4'
S_ROCK = 0
ENDCASE

DO CASE
CASE M.STONE = 'NONE' OR M.STONE = '1' OR
M.STONE = ''
S_STONE = 1
CASE M.STONE = '2'
S_STONE = 0.8
CASE M.STONE = '3'
S_STONE = 0.5

```

```

CASE M.STONE = '4'
  S_STONE = 0
ENDCASE

```

```

DO CASE
CASE M.ROOT_PE <= ROOT_PE1
  S_ROOT_PE = 1
CASE M.ROOT_PE = ROOT_PE2
  S_ROOT_PE = 0.8
CASE M.ROOT_PE = ROOT_PE3
  S_ROOT_PE = 0.5
CASE M.ROOT_PE = ROOT_PE4
  S_ROOT_PE = 0
ENDCASE

```

```

ENDI

```

```

** Calculate suitability rating by different methods **

```

```

IF Eva_met_lmu = 'FAO'
  I_MIN = MIN(S_SLOP,S_RAIN,S_TEMP,S_ROOT,;
    S_PH,S_SALE,S_DR,S_TE,S_CEC,;
    S_P,S_K)

```

```

else
  I_MIN = MIN(S_SLOP,S_RAIN,S_TEMP,S_ROOT,;
    S_PH,S_SALE,S_DR,S_P,S_CEC,;
    S_K,S_ORG,S_BS,S_ROCK,S_STONE,;
    S_ROOT_PE)

```

```

endi

```

```

** define suffix **
SUFF1 = "
SUFF2 = "
SUFF3 = "
SUFF4 = "
SUFF5 = "
SUFF6 = "
SUFF7 = "
SUFF8 = "

```

```

IF Eva_met_lmu = 'FAO'
  IF S_RAIN = I_MIN
    SUFF1 = 'm'
  ENDI
  IF S_DR = I_MIN
    SUFF2 = 'o'
  ENDI
  IF S_PH = I_MIN or S_P = I_MIN or S_K = I_MIN
    SUFF3 = 's'
  ENDI
  IF S_ROOT = I_MIN or S_TE = I_MIN
    SUFF4 = 'r'
  ENDI
  IF S_SLOP = I_MIN
    SUFF5 = 'w'
  ENDI
  IF S_TEMP = I_MIN
    SUFF6 = 't'
  ENDI
  IF S_CEC = I_MIN
    SUFF7 = 'n'
  ENDI
  IF S_SALE = I_MIN
    SUFF8 = 'x'
  ENDI
ELSE
  IF S_RAIN = I_MIN
    SUFF1 = 'm'
  ENDI
  IF S_DR = I_MIN

```

```

    SUFF2 = 'o'
  ENDI
  IF S_PH = I_MIN or S_P = I_MIN or S_K = I_MIN or
  S_ORG = I_MIN
    SUFF3 = 's'
  ENDI
  IF S_ROOT = I_MIN or S_ROOT_PE = I_MIN
    SUFF4 = 'r'
  ENDI
  IF S_SLOP = I_MIN or S_ROCK = I_MIN or S_STONE
  = I_MIN
    SUFF5 = 'w'
  ENDI
  IF S_TEMP = I_MIN
    SUFF6 = 't'
  ENDI
  IF S_CEC = I_MIN or S_BS = I_MIN
    SUFF7 = 'n'
  ENDI
  IF S_SALE = I_MIN
    SUFF8 = 'x'
  ENDI
ENDI

```

```

DO CASE
CASE EVALUAT = "L_MIN"
  S_TOTAL = I_MIN
DO CASE
CASE S_TOTAL = 0.5
  S_TOTAL = 0.3
CASE S_TOTAL = 0.8
  S_TOTAL = 0.6
ENDC
CASE EVALUAT = "DLD"
DO DLD_CAL
CASE EVALUAT = "ITC"
DO ITC_CAL
ENDCASE

```

```

S = ""
S_ID = 0

```

```

***CLASS***
DO CASE
CASE S_TOTAL < 0.20
  S = 'N'
  S_ID = 4  && for idrisi
CASE S_TOTAL >= 0.20 AND S_TOTAL < 0.40
  S =
  ALLTRIM('S3'+SUFF1+SUFF2+SUFF3+SUFF4+SUFF5+
  SUFF6+SUFF7+SUFF8)
  S_ID = 3
CASE S_TOTAL >= 0.40 AND S_TOTAL < 0.80
  S =
  ALLTRIM('S2'+SUFF1+SUFF2+SUFF3+SUFF4+SUFF5+
  SUFF6+SUFF7+SUFF8)
  S_ID = 2
CASE S_TOTAL >= .80
  S = 'S1'
  S_ID = 1
ENDCASE

```

```

** Replace data to database **

```

```

IF lloop = 1
  sele 6
  appe blank
  repl AREA_ID with m.area
  repl PRAO_ with m.area

```



```

repl crop1 with m.crop
repl grade1 with S_TOTAL
repl c1 with S
repl suit_c1 with s_id
else
sele 6
repl &fcrop with m.crop
repl &fgrade with S_TOTAL
repl &fclass with S
repl &fc_id with s_id
skip
endi
SELECT 1
SKIP
ENDDO && end loop for LMU

TLOOP = tloop+1

** define field to replace

FCROP = 'CROP'+ALLTRIM(str(TLOOP))
FGRADE = 'GRADE'+ALLTRIM(str(TLOOP))
fclass = 'C'+ALLTRIM(str(TLOOP))
fc_id = 'SUIT_C'+ALLTRIM(str(TLOOP))

SELE 6
GO TOP
SELE 2
SKIP
@ 13,20,14,c BOX replicate(chr(178),9)
c = c+b

ENDD && end loop for LUT

*** define DATA to be copy ***
ZZ = "
A = 1
DO WHILE A < R_COUNT+1
T = ALLTRIM(STR(A))
IF A = R_COUNT
ZZ = ZZ+C'+T+',SUIT_C+T
ELSE
ZZ = ZZ+C'+T+',SUIT_C+T+',
ENDI
A = A+1
ENDD

SELE 6
DO CASE
CASE Eva_met_lmu = 'DLD' and Evaluat = 'L_MIN'
ERASE MIN_DLD.DBF
TCOPY = 'COPY TO MIN_DLD FIELDS
AREA_ID,PRAO_',+ZZ
&TCOPY
CASE Eva_met_lmu = 'DLD' and Evaluat = 'TTC'
ERASE ITC_DLD.DBF
TCOPY = 'COPY TO ITC_DLD FIELDS
AREA_ID,PRAO_',+ZZ
&TCOPY
CASE Eva_met_lmu = 'DLD' and Evaluat = 'DLD'
ERASE DLD_DLD.DBF
TCOPY = 'COPY TO DLD_DLD FIELDS
AREA_ID,PRAO_',+ZZ
&TCOPY
CASE Eva_met_lmu = 'FAO' and Evaluat = 'L_MIN'
ERASE MIN_FAO.DBF
TCOPY = 'COPY TO MIN_FAO FIELDS
AREA_ID,PRAO_',+ZZ
&TCOPY
CASE Eva_met_lmu = 'FAO' and Evaluat = 'TTC'
ERASE ITC_FAO.DBF

```

```

TCOPY = 'COPY TO ITC_FAO FIELDS
AREA_ID,PRAO_',+ZZ
&TCOPY
CASE Eva_met_lmu = 'FAO' and Evaluat = 'DLD'
ERASE DLD_FAO.DBF
TCOPY = 'COPY TO DLD_FAO FIELDS
AREA_ID,PRAO_',+ZZ
&TCOPY
ENDCASE

IF Eva_met_lmu = 'FAO'
@ 17,15 SAY ' The result of Evaluation file Saved in'
do case
case Evaluat = 'L_MIN'
@ 18,25 SAY ' MIN_FAO '
case Evaluat = 'TTC'
@ 18,25 SAY ' ITC_FAO '
case Evaluat = 'DLD'
@ 18,25 SAY ' DLD_FAO '
endc
ELSE
@ 17,15 SAY ' The result of Evaluation file Saved in'
do case
case Evaluat = 'L_MIN'
@ 18,25 SAY ' MIN_DLD '
case Evaluat = 'TTC'
@ 18,25 SAY ' ITC_DLD '
case Evaluat = 'DLD'
@ 18,25 SAY ' DLD_DLD '
endc
ENDI
clos all
clea all

```

```

** END **

```

```

** Procedure Modified multiplication calulation **

```

```

PROCEDURE ITC_CAL

```

```

I_CAL = 0
I_N = 0
I_CAL1 = 0
I_N1 = 0

```

```

IF S_SLOP = I_MIN
I_CAL = S_SLOP+I_CAL
I_N = I_N+1

```

```

ELSE
I_CAL1 = S_SLOP+I_CAL1
I_N1 = I_N1+1
ENDI

```

```

IF S_RAIN = I_MIN
I_CAL = S_RAIN+I_CAL
I_N = I_N+1
ELSE
I_CAL1 = S_RAIN+I_CAL1
I_N1 = I_N1+1
ENDI

```

```

IF S_TEMP = I_MIN
I_CAL = S_TEMP+I_CAL
I_N = I_N+1
ELSE
I_CAL1 = S_TEMP+I_CAL1
I_N1 = I_N1+1

```

```

ENDI
IF S_ROOT = I_MIN
  I_CAL = S_ROOT + I_CAL
  I_N = I_N + 1
ELSE
  I_CAL1 = S_ROOT + I_CAL1
  I_N1 = I_N1 + 1
ENDI

IF S_PH = I_MIN
  I_CAL = S_PH + I_CAL
  I_N = I_N + 1
ELSE
  I_CAL1 = S_PH + I_CAL1
  I_N1 = I_N1 + 1
ENDI

IF S_SALE = I_MIN
  I_CAL = S_SALE + I_CAL
  I_N = I_N + 1
ELSE
  I_CAL1 = S_SALE + I_CAL1
  I_N1 = I_N1 + 1
ENDI

IF S_DR = I_MIN
  I_CAL = S_DR + I_CAL
  I_N = I_N + 1
ELSE
  I_CAL1 = S_DR + I_CAL1
  I_N1 = I_N1 + 1
ENDI

IF S_CEC = I_MIN
  I_CAL = S_CEC + I_CAL
  I_N = I_N + 1
ELSE
  I_CAL1 = S_CEC + I_CAL1
  I_N1 = I_N1 + 1
ENDI

IF S_P = I_MIN
  I_CAL = S_P + I_CAL
  I_N = I_N + 1
ELSE
  I_CAL1 = S_P + I_CAL1
  I_N1 = I_N1 + 1
ENDI

IF S_K = I_MIN
  I_CAL = S_K + I_CAL
  I_N = I_N + 1
ELSE
  I_CAL1 = S_K + I_CAL1
  I_N1 = I_N1 + 1
ENDI

DO CASE
CASE Eva_met_lmu = 'FAO'
  IF S_TE = I_MIN
    I_CAL = S_TE + I_CAL
    I_N = I_N + 1
  ELSE
    I_CAL1 = S_TE + I_CAL1
    I_N1 = I_N1 + 1
  ENDI
CASE Eva_met_lmu = 'DLD'
  IF S_ORG = I_MIN
    I_CAL = S_ORG + I_CAL
    I_N = I_N + 1

```

```

ELSE
  I_CAL1 = S_ORG + I_CAL1
  I_N1 = I_N1 + 1
ENDI
IF S_BS = I_MIN
  I_CAL = S_BS + I_CAL
  I_N = I_N + 1
ELSE
  I_CAL1 = S_BS + I_CAL1
  I_N1 = I_N1 + 1
ENDI
IF S_ROCK = I_MIN
  I_CAL = S_ROCK + I_CAL
  I_N = I_N + 1
ELSE
  I_CAL1 = S_ROCK + I_CAL1
  I_N1 = I_N1 + 1
ENDI
IF S_STONE = I_MIN
  I_CAL = S_STONE + I_CAL
  I_N = I_N + 1
ELSE
  I_CAL1 = S_STONE + I_CAL1
  I_N1 = I_N1 + 1
ENDI
IF S_ROOT_PE = I_MIN
  I_CAL = S_ROOT_PE + I_CAL
  I_N = I_N + 1
ELSE
  I_CAL1 = S_ROOT_PE + I_CAL1
  I_N1 = I_N1 + 1
ENDI
ENDCASE

S_TOTAL = 0

DO CASE
CASE I_N1 = 0
  S_TOTAL = I_CAL / I_N
CASE I_N = 0
  S_TOTAL = I_CAL1 / I_N1
CASE I_N > 0 AND I_N1 > 0
  S_TOTAL = (I_CAL / I_N) * (I_CAL1 / I_N1)
ENDCASE

RETURN

```

** Procedure Multiplication Calculation**

```

PROCEDURE DLD_CAL
IF Eva_met_lmu = 'FAO'
  S_TOTAL1 = S_RAIN * S_TEMP * S_ROOT *
    S_PH * S_SALE * S_DR * S_TE * S_CEC *
    S_P * S_K
  S_TOTAL2 = S_SLOP
ELSE
  S_TOTAL1 = S_RAIN * S_TEMP * S_ROOT *
    S_PH * S_DR * S_SALE * S_P * S_CEC *
    S_K * S_ORG * S_BS * S_ROOT * S_PE
  S_TOTAL2 = S_SLOP * S_ROCK * S_STONE
ENDI

DO CASE
CASE S_TOTAL1 < 0.20
  S_T1 = 0
CASE S_TOTAL1 >= 0.20 AND S_TOTAL1 < 0.40
  S_T1 = .5
CASE S_TOTAL1 >= 0.40 AND S_TOTAL1 < 0.80
  S_T1 = .8
CASE S_TOTAL1 >= .80

```

```
S_T1 = 1
ENDCASE
```

```
DO CASE
CASE S_TOTAL2 < 0.20
  S_T2 = 0
CASE S_TOTAL2 >= 0.20 AND S_TOTAL2 < 0.40
  S_T2 = .5
CASE S_TOTAL2 >= 0.40 AND S_TOTAL2 < 0.80
  S_T2 = .8
CASE S_TOTAL2 >= .80
  S_T2 = 1
ENDCASE
```

```
S_TOTAL = S_T1*S_T2
```

```
RETURN
```

```
** Procedure LUR_FAO **
```

```
PROCEDURE LUR_FAO
```

```
PUBL T1UH,T1LH,RA1U,RA1L,DR1,TE1,;
CEC1,P1,K1,RO1U,RO1L,PH1UH,;
PH1LH,SAL1U,SAL1L,SLOP1U,SLOP1L,;
P1U,P1L,K1L,K1U,OR1U,OR1L,CEC1U,;
CEC1L,BS1U,BS1L,ROCK1,STONE1,;
ROOT_PE1,T2UH,T2LH,T2UL,T2LL,;
RA2U,RA2L,DR2,TE2,CEC2,P2,K2,;
RO2U,RO2L,PH2UH,PH2LH,PH2UL,;
PH2LL,SAL2U,SAL2L,SLOP2U,SLOP2L,;
P2U,P2L,K2L,K2U,OR2U,OR2L,CEC2U,;
CEC2L,BS2U,BS2L,ROCK2,STONE2,ROOT_PE2,;
T3UH,T3LH,T3UL,T3LL,RA3U,RA3L,;
DR3,TE3,CEC3,P3,K3,RO3U,RO3L,;
PH3UH,PH3LH,PH3UL,PH3LL,SAL3U,;
SAL3L,SLOP3U,SLOP3L,P3U,P3L,K3L,;
K3U,OR3U,OR3L,CEC3U,CEC3L,BS3U,;
BS3L,ROCK3,STONE3,ROOT_PE3,;
T4UH,T4LH,T4UL,T4LL,RA4U,RA4L,;
DR4,TE4,CEC4,P4,K4,RO4U,RO4L,;
PH4UH,PH4LH,PH4UL,PH4LL,SAL4U,;
SAL4L,SLOP4U,SLOP4L,P4U,P4L,;
K4L,K4U,OR4U,OR4L,CEC4U,CEC4L,;
BS4U,BS4L,ROCK4,STONE4,ROOT_PE4
```

```
locate for ALLTRIM(UPPER(CROP))=M.CROP
```

```
T1UH = TUP_HI
T1LH = TLO_HI
RA1U = R_UP
RA1L = R_LO
DR1 = ALLTRIM(UPPER(C_DRAIN))
TE1 = ALLTRIM(UPPER(C_TEXT))
CEC1 = ALLTRIM(UPPER(C_EC))
P1 = ALLTRIM(UPPER(C_P))
K1 = ALLTRIM(UPPER(C_K))
RO1U = RO_UP
RO1L = RO_LO
PH1UH = PHUP_HI
PH1LH = PHLO_HI
SAL1U = SAL_UP
SAL1L = SAL_LO
SLOP1U = SLOP_UP
SLOP1L = SLOP_LO
```

```
continue
```

```
T2UH = TUP_HI
T2LH = TLO_HI
T2UL = TUP_LO
T2LL = TLO_LO
```

```
RA2U = R_UP
RA2L = R_LO
DR2 = ALLTRIM(UPPER(C_DRAIN))
TE2 = ALLTRIM(UPPER(C_TEXT))
CEC2 = ALLTRIM(UPPER(C_EC))
P2 = ALLTRIM(UPPER(C_P))
K2 = ALLTRIM(UPPER(C_K))
RO2U = RO_UP
RO2L = RO_LO
PH2UH = PHUP_HI
PH2LH = PHLO_HI
PH2UL = PHUP_LO
PH2LL = PHLO_LO
SAL2U = SAL_UP
SAL2L = SAL_LO
SLOP2U = SLOP_UP
SLOP2L = SLOP_LO
```

```
continue
```

```
T3UH = TUP_HI
T3LH = TLO_HI
T3UL = TUP_LO
T3LL = TLO_LO
RA3U = R_UP
RA3L = R_LO
DR3 = ALLTRIM(UPPER(C_DRAIN))
TE3 = ALLTRIM(UPPER(C_TEXT))
CEC3 = ALLTRIM(UPPER(C_EC))
P3 = ALLTRIM(UPPER(C_P))
K3 = ALLTRIM(UPPER(C_K))
RO3U = RO_UP
RO3L = RO_LO
PH3UH = PHUP_HI
PH3LH = PHLO_HI
PH3UL = PHUP_LO
PH3LL = PHLO_LO
SAL3U = SAL_UP
SAL3L = SAL_LO
SLOP3U = SLOP_UP
SLOP3L = SLOP_LO
```

```
continue
```

```
T4UH = TUP_HI
T4LH = TLO_HI
T4UL = TUP_LO
T4LL = TLO_LO
RA4U = R_UP
RA4L = R_LO
DR4 = ALLTRIM(UPPER(C_DRAIN))
TE4 = ALLTRIM(UPPER(C_TEXT))
CEC4 = ALLTRIM(UPPER(C_EC))
P4 = ALLTRIM(UPPER(C_P))
K4 = ALLTRIM(UPPER(C_K))
RO4U = RO_UP
RO4L = RO_LO
PH4UH = PHUP_HI
PH4LH = PHLO_HI
PH4UL = PHUP_LO
PH4LL = PHLO_LO
SAL4U = SAL_UP
SAL4L = SAL_LO
SLOP4U = SLOP_UP
SLOP4L = SLOP_LO
```

```
RETURN
```

```
** Procedure LUR_DLD **
```

```
PROCEDURE LUR_DLD
```

```
PUBL T1UH,T1LH,RA1U,RA1L,DR1,TE1,;
```

```

CEC1,P1,K1,RO1U,RO1L,PH1UH,;
PH1LH,SAL1U,SAL1L,SLOP1U,SLOP1L,;
P1U,P1L,K1L,K1U,OR1U,OR1L,CEC1U,;
CEC1L,BS1U,BS1L,ROCK1,STONE1,;
ROOT_PE1,T2UH,T2LH,T2UL,T2LL,;
RA2U,RA2L,DR2,TE2,CEC2,P2,K2,;
RO2U,RO2L,PH2UH,PH2LH,PH2UL,;
PH2LL,SAL2U,SAL2L,SLOP2U,SLOP2L,;
P2U,P2L,K2L,K2U,OR2U,OR2L,CEC2U,;
CEC2L,BS2U,BS2L,ROCK2,STONE2,ROOT_PE2,;
T3UH,T3LH,T3UL,T3LL,RA3U,RA3L,;
DR3,TE3,CEC3,P3,K3,RO3U,RO3L,;
PH3UH,PH3LH,PH3UL,PH3LL,SAL3U,;
SAL3L,SLOP3U,SLOP3L,P3U,P3L,K3L,;
K3U,OR3U,OR3L,CEC3U,CEC3L,BS3U,;
BS3L,ROCK3,STONE3,ROOT_PE3,;
T4UH,T4LH,T4UL,T4LL,RA4U,RA4L,;
DR4,TE4,CEC4,P4,K4,RO4U,RO4L,;
PH4UH,PH4LH,PH4UL,PH4LL,SAL4U,;
SAL4L,SLOP4U,SLOP4L,P4U,P4L,;
K4L,K4U,OR4U,OR4L,CEC4U,CEC4L,;
BS4U,BS4L,ROCK4,STONE4,ROOT_PE4

```

locate for ALLTRIM(UPPER(CROP))=M.CROP

IF EFRA_LO = 0 AND EFRA_UP = 0

RA1U = R_UP

RA1L = R_LO

RRR = 1

ELSE

RA1U = EFRA_UP

RA1L = EFRA_LO

RRR = 2

ENDI

T1UH = D_TUP_HI

T1LH = D_TLO_HI

DR1 = ALLTRIM(UPPER(D_DRAIN))

P1U = D_P_UP

P1L = D_P_LO

K1U = D_K_UP

K1L = D_K_LO

OR1U = D_ORG_UP

OR1L = D_ORG_LO

PH1UH = D_PHUP_HI

PH1LH = D_PHLO_HI

CEC1U = D_CEC_UP

CEC1L = D_CEC_LO

BS1U = D_BS_UP

BS1L = D_BS_LO

RO1U = D_SOIL_UP

RO1L = D_SOIL_LO

SAL1U = D_EC_UP

SAL1L = D_EC_LO

SLOP1U = D_SLOP_UP

SLOP1L = D_SLOP_LO

ROCK1 = ALLTRIM(UPPER(D_ROCK))

STONE1 = ALLTRIM(UPPER(D_STONE))

ROOT_PE1 = D_ROOT_PE

continue

IF RRR = 1

RA2U = R_UP

RA2L = R_LO

ELSE

RA2U = EFRA_UP

RA2L = EFRA_LO

ENDI

T2UH = D_TUP_HI

T2LH = D_TLO_HI

T2UL = D_TUP_LO

T2LL = D_TLO_LO

DR2 = ALLTRIM(UPPER(D_DRAIN))

P2U = D_P_UP

P2L = D_P_LO

K2U = D_K_UP

K2L = D_K_LO

OR2U = D_ORG_UP

OR2L = D_ORG_LO

PH2UH = D_PHUP_HI

PH2LH = D_PHLO_HI

PH2UL = D_PHUP_LO

PH2LL = D_PHLO_LO

CEC2U = D_CEC_UP

CEC2L = D_CEC_LO

BS2U = D_BS_UP

BS2L = D_BS_LO

RO2U = D_SOIL_UP

RO2L = D_SOIL_LO

SAL2U = D_EC_UP

SAL2L = D_EC_LO

SLOP2U = D_SLOP_UP

SLOP2L = D_SLOP_LO

ROCK2 = ALLTRIM(UPPER(D_ROCK))

STONE2 = ALLTRIM(UPPER(D_STONE))

ROOT_PE2 = D_ROOT_PE

continue

IF RRR = 1

RA3U = R_UP

RA3L = R_LO

ELSE

RA3U = EFRA_UP

RA3L = EFRA_LO

ENDI

T3UH = D_TUP_HI

T3LH = D_TLO_HI

T3UL = D_TUP_LO

T3LL = D_TLO_LO

DR3 = ALLTRIM(UPPER(D_DRAIN))

P3U = D_P_UP

P3L = D_P_LO

K3U = D_K_UP

K3L = D_K_LO

OR3U = D_ORG_UP

OR3L = D_ORG_LO

PH3UH = D_PHUP_HI

PH3LH = D_PHLO_HI

PH3UL = D_PHUP_LO

PH3LL = D_PHLO_LO

CEC3U = D_CEC_UP

CEC3L = D_CEC_LO

BS3U = D_BS_UP

BS3L = D_BS_LO

RO3U = D_SOIL_UP

RO3L = D_SOIL_LO

SAL3U = D_EC_UP

SAL3L = D_EC_LO

SLOP3U = D_SLOP_UP

SLOP3L = D_SLOP_LO

ROCK3 = ALLTRIM(UPPER(D_ROCK))

STONE3 = ALLTRIM(UPPER(D_STONE))

ROOT_PE3 = D_ROOT_PE

continue

IF RRR = 1

RA4U = R_UP

RA4L = R_LO

ELSE

RA4U = EFRA_UP

RA4L = EFRA_LO

ENDI

```

T4UH = D_TUP_HI
T4LH = D_TLO_HI
T4UL = D_TUP_LO
T4LL = D_TLO_LO
DR4 = ALLTRIM(UPPER(D_DRAIN))
P4U = D_P_UP
P4L = D_P_LO
K4U = D_K_UP
K4L = D_K_LO
OR4U = D_ORG_UP
OR4L = D_ORG_LO
PH4UH = D_PHUP_HI
PH4LH = D_PHLO_HI
PH4UL = D_PHUP_LO
PH4LL = D_PHLO_LO
CEC4U = D_CEC_UP
CEC4L = D_CEC_LO
BS4U = D_BS_UP
BS4L = D_BS_LO
RO4U = D_SOIL_UP
RO4L = D_SOIL_LO
SAL4U = D_EC_UP
SAL4L = D_EC_LO
SLOP4U = D_SLOP_UP
SLOP4L = D_SLOP_LO
ROCK4 = ALLTRIM(UPPER(D_ROCK))
STONE4 = ALLTRIM(UPPER(D_STONE))
ROOT_PE4 = D_ROOT_PE

RETURN

```

```

** Procedure LC_F for FAO **

```

```

PROCEDURE LC_F
m.soil_id = soil_id
m.slope = slope
m.rain = rain
m.temp = temp

SELECT 4
m.drain = '%'+UPPER(ALLTRIM(drainage))+%'
m.text = '%'+UPPER(ALLTRIM(tops_text))+%'
m.root = root_dep
m.ph = tops_ph
m.sal = subs_sali
m.cec = '%'+UPPER(ALLTRIM(subs_cec))+%'

```

```

m.p = '%'+UPPER(ALLTRIM(tops_p))+%'
m.k = '%'+UPPER(ALLTRIM(tops_k))+%'
SELECT 1

```

```

RETURN

```

```

** Procedure LC_D for DLD **

```

```

PROCEDURE LC_D
m.soil_id = soil_id
m.slope = slope
m.rain1 = rain
m.temp = temp

if m.crop = "WETLAND RICE"
  m.rain = ef_ra_ri
else
  m.rain = ef_ra_fc
endi

if RRR = 1
  m.rain = m.rain1
endi

SELECT 4
m.drain = '%'+UPPER(ALLTRIM(dra))+%'
m.p = p2
m.k = k2
m.org = organic
m.ph = ph2
m.cec = cec2
m.bs = b_s
m.root = eff_dept
m.sal = ec
m.rock = UPPER(ALLTRIM(rock))
m.stone = UPPER(ALLTRIM(stone))
m.root_pe = root_pe

SELECT 1

RETURN

***** END PROCEDURE *****

```

Appendix Table 35. File structure of suitability class as evaluated by the Law of Minimum method with LUR as defined by CSR/FAO (1983).

Structure for database : D:\SIRICHAILAND_EVAMIN_FAO.DBF
 Number of data records : 973
 Date of last update : 10/21/93

Field	Field Name	Type	Width	Dec	Index
1	AREA_ID	Numeric	13	6	
2	PRAO_	Numeric	11		
3	C1	Character	20		
4	SUIT_C1	Numeric	3		
5	C2	Character	20		
6	SUIT_C2	Numeric	3		
7	C3	Character	20		
8	SUIT_C3	Numeric	3		
9	C4	Character	20		
10	SUIT_C4	Numeric	3		
11	C5	Character	20		
12	SUIT_C5	Numeric	3		
13	C6	Character	20		
14	SUIT_C6	Numeric	3		
15	C7	Character	20		
16	SUIT_C7	Numeric	3		
** Total **			186		

Appendix Table 36. File structure of suitability class as evaluated by the Law of Minimum method with LUR as defined by DLD (1992).

Structure for database : D:\SIRICHAILAND_EVAMIN_DLD.DBF
 Number of data records : 973
 Date of last update : 10/21/93

Field	Field Name	Type	Width	Dec	Index
1	AREA_ID	Numeric	13	6	
2	PRAO_	Numeric	11		
3	C1	Character	20		
4	SUIT_C1	Numeric	3		
5	C2	Character	20		
6	SUIT_C2	Numeric	3		
7	C3	Character	20		
8	SUIT_C3	Numeric	3		
9	C4	Character	20		
10	SUIT_C4	Numeric	3		
11	C5	Character	20		
12	SUIT_C5	Numeric	3		
13	C6	Character	20		
14	SUIT_C6	Numeric	3		
15	C7	Character	20		
16	SUIT_C7	Numeric	3		
** Total **			186		

Appendix Table 37. File structure of suitability class as evaluated by the Multiplication method with LUR as defined by CSR/FAO (1983).

Structure for database : D:\SIRICHA\LAND_EVADLD_FAO.DBF

Number of data records : 973

Date of last update : 10/21/93

Field	Field Name	Type	Width	Dec	Index
1	AREA_ID	Numeric	13	6	
2	PRAO_	Numeric	11		
3	C1	Character	20		
4	SUIT_C1	Numeric	3		
5	C2	Character	20		
6	SUIT_C2	Numeric	3		
7	C3	Character	20		
8	SUIT_C3	Numeric	3		
9	C4	Character	20		
10	SUIT_C4	Numeric	3		
11	C5	Character	20		
12	SUIT_C5	Numeric	3		
13	C6	Character	20		
14	SUIT_C6	Numeric	3		
15	C7	Character	20		
16	SUIT_C7	Numeric	3		
**	Total **		186		

Appendix Table 38. File structure of suitability class as evaluated by the Multiplication method with LUR as defined by DLD (1992).

Structure for database : D:\SIRICHA\LAND_EVADLD_DLD.DBF

Number of data records : 973

Date of last update : 10/21/93

Field	Field Name	Type	Width	Dec	Index
1	AREA_ID	Numeric	13	6	
2	PRAO_	Numeric	11		
3	C1	Character	20		
4	SUIT_C1	Numeric	3		
5	C2	Character	20		
6	SUIT_C2	Numeric	3		
7	C3	Character	20		
8	SUIT_C3	Numeric	3		
9	C4	Character	20		
10	SUIT_C4	Numeric	3		
11	C5	Character	20		
12	SUIT_C5	Numeric	3		
13	C6	Character	20		
14	SUIT_C6	Numeric	3		
15	C7	Character	20		
16	SUIT_C7	Numeric	3		
**	Total **		186		

Appendix Table 39. File structure of suitability class as evaluated by the Modified Multiplication method with LUR as defined by CSR/FAO (1983).

Structure for database : D:\SIRICHAILAND_EVAVTC_FAO.DBF
 Number of data records : 973
 Date of last update : 10/21/93

Field	Field Name	Type	Width	Dec	Index
1	AREA_ID	Numeric	13	6	
2	PRAO_	Numeric	11		
3	C1	Character	20		
4	SUIT_C1	Numeric	3		
5	C2	Character	20		
6	SUIT_C2	Numeric	3		
7	C3	Character	20		
8	SUIT_C3	Numeric	3		
9	C4	Character	20		
10	SUIT_C4	Numeric	3		
11	C5	Character	20		
12	SUIT_C5	Numeric	3		
13	C6	Character	20		
14	SUIT_C6	Numeric	3		
15	C7	Character	20		
16	SUIT_C7	Numeric	3		
** Total **			186		

Appendix Table 40. File structure of suitability class as evaluated by the Modified Multiplication method with LUR as defined by DLD (1992).

Structure for database : D:\SIRICHAILAND_EVAVTC_DLD.DBF
 Number of data records : 973
 Date of last update : 10/21/93

Field	Field Name	Type	Width	Dec	Index
1	AREA_ID	Numeric	13	6	
2	PRAO_	Numeric	11		
3	C1	Character	20		
4	SUIT_C1	Numeric	3		
5	C2	Character	20		
6	SUIT_C2	Numeric	3		
7	C3	Character	20		
8	SUIT_C3	Numeric	3		
9	C4	Character	20		
10	SUIT_C4	Numeric	3		
11	C5	Character	20		
12	SUIT_C5	Numeric	3		
13	C6	Character	20		
14	SUIT_C6	Numeric	3		
15	C7	Character	20		
16	SUIT_C7	Numeric	3		
** Total **			186		

Appendix Table 41. Program listing of SML file to plot absolute suitability output plot files in PC ARC/INFO.

```

&rem
&rem SML for plot file COLOR SCREEN
&rem Absolute suitability in PRAO
&rem require %1 = crop name
&rem

clear
BOX 0 0 8.4 6.3
BOX .2 .3 5.8 5.9
linec 3
BOX 6.1 1 7.3 2.5
linec 1
LINE 6 0 6 6.3
shadeset color

MAPE pr_mt
mapp cen cen
MAPL 6.1 1 7.3 2.5
ASEL PR_MT POLY
mapsc automatic
ARCS PR_MT

&rem north arrow
move 7.7 1
textsi .15
textfont 10
text 'N'
shadesy 15
shade 7.7 1.2 7.85 1.2 7.85 1.4 7.95 1.4 7.78
1.9 7.6 1.4 7.7 1.4 7.7 1.2

&rem text design
textfont 0
textsi .09
MOVE 6.02 2.6
TEXT ' Tambon boundary'
TEXTsi .11
MOVE 6.1 6
Text 'Absolute Suitability'
Move 6.3 5.7
text 'WANG'
TEXT ""
TEXT 's method'
line 6 5.5 8.4 5.5

move .2 .1
text 'Multiple Cropping Center, Faculty of
Agriculture, CMU.'

&rem legend
textsi .1
move 6.2 4.85
text 'LEGEND'

keybox .25 .15
Keyposition 6.2 4.65

Keysepara .15 .15
keyshade legend-s.val

&rem plot file for select crop

&goto CROP1 &if &eq %1 1
&goto CROP2 &if &eq %1 2
&goto CROP3 &if &eq %1 3
&goto CROP4 &if &eq %1 4
&goto CROP5 &if &eq %1 5
&goto CROP6 &if &eq %1 6
&goto CROP7 &if &eq %1 7
&goto CROP8 &if &eq %1 8
&goto CROP9 &if &eq %1 9
&goto CROP10 &if &eq %1 10
&goto CROP11 &if &eq %1 11
&goto CROP12 &if &eq %1 12
&goto CROP13 &if &eq %1 13
&goto CROP14 &if &eq %1 14

&label tb
move 6.2 5.2
text '%50'

&rem plot file for field crop
mapsc 13000
MAPP LL LL
MAPE scal13
MAPL 6.2 .15 8.2 1
ARCS scal13
POLYGONS scal13 BAR
ANNOTEXT scal13

move 2 6.05
textsi .14
textfo 1
Text 'PRAO DISTRICT'

MAPE PRAO
mapp cen cen
MAPL .2 .2 5.8 6
mapsc 13000

&label map
asel PRAO poly
res PRAO poly C%1 = 'N'
polygons PRAO 2

asel PRAO poly
res PRAO poly C%1 = 'S1'
polygons PRAO 3

asel PRAO poly
res PRAO poly C%1 = 'S2'
polygons PRAO 4

```

```

asel PRAO poly
res PRAO poly C%1 = 'S3'
polygons PRAO 5

```

```
&goto end
```

```
&rem define crop name
```

```

&label CROP1
&sv 50 "WETLAND RICE"
&goto tb

```

```

&label crop2
&sv 50 "UPLAND RICE"
&goto tb

```

```

&label crop3
&sv 50 "MAIZE"
&goto tb

```

```

&label crop4
&sv 50 "SORGHUM"
&goto tb

```

```

&label crop5
&sv 50 "CASSAVA"
&goto tb

```

```

&label crop6
&sv 50 "SWEET POTATO"
&goto tb

```

```

&label crop7
&sv 50 "WHITE POTATO"
&goto tb

```

```

&label crop8
&sv 50 "YAMS"
&goto tb

```

```

&label crop9
&sv 50 "TARO"
&goto tb

```

```

&label crop10
&sv 50 "SOYBEAN"
&goto tb

```

```

&label crop11
&sv 50 "PEANUT"
&goto tb

```

```

&label crop12
&sv 50 "PHOSEOLUS BEAN"
&goto tb

```

```

&label crop13
&sv 50 "COTTON"
&goto tb

```

```

&label crop14
&sv 50 "SUGARCANE"
&goto tb

```

Appendix Table 42. Program listing of SML file to plot relative suitability output plot files in PC ARC/INFO.

```
&rem
&rem SML for plot file COLOR SCREEN &rem
Relative suitability in PRAO
&rem
```

```
clear
BOX 0 0 8.4 6.3
BOX .2 .3 5.8 5.9
linec 3
BOX 6.1 1 7.3 2.5
linec 1
LINE 6 0 6 6.3
shadeset color

MAPE pr_mt
mapp cen cen
MAPL 6.1 1 7.3 2.5
ASEL PR_MT POLY
mapsc automatic
ARCS PR_MT

&rem north arrow
move 7.7 1
textsi .15
textfont 10
text 'N'
shadesy 15
shade 7.7 1.2 7.85 1.2 7.85 1.4 7.95 1.4 7.78 1.9
7.6 1.4 7.7 1.4 7.7 1.2

&rem text design
textfont 0
textsi .09
MOVE 6.02 2.6
TEXT ' Tambon boundary'
TEXTsi .11
MOVE 6.1 6
Text 'Relative Suitability'
Move 6.3 5.7
text 'WANG'
TEXT ""
TEXT 's method'
line 6 5.5 8.4 5.5

move .2 .1
text 'Multiple Cropping Center, Faculty of
Agriculture, CMU.'

&rem legend
textsi .1
move 6.2 5.15
text 'LEGEND'

keybox .25 .15
Keyposition 6.2 5.
Keysepara .15 .15
```

```
keyshade legend.val
```

```
&rem plot file for field crop
mapsc 13000
MAPP LL LL
MAPE scal13
MAPL 6.2 .15 8.2 1
ARCS scal13
POLYGONS scal13 BAR
ANNOTEXT scal13

move 2 6.05
textsi .14
textfo 1
Text 'PRAO DISTRICT'
```

```
MAPE PRAO
mapp cen cen
MAPL .2 .2 5.8 6
mapsc 13000
```

```
asel PRAO poly
res PRAO poly FC = 50
polygons PRAO 2
```

```
asel PRAO poly
res PRAO poly FC = 1
polygons PRAO 1
```

```
asel PRAO poly
res PRAO poly FC = 10
polygons PRAO 3
```

```
asel PRAO poly
res PRAO poly FC = 11
polygons PRAO 4
```

```
asel PRAO poly
res PRAO poly FC = 12
polygons PRAO 5
```

```
asel PRAO poly
res PRAO poly FC = 14
polygons PRAO 7
```

Appendix Table 43. Program listing START.SPR containing the source codes of the System Shell to define environment, variables and starting system shell.

START.SPR	
* START Setup Code - SECTION 1	<pre> USE (LOCFILE("../dbfs\units.dbf","DBF","Where is units?")); AGAIN ALIAS units; ORDER 0 ENDIF IF USED("factors") SELECT factors SET ORDER TO 0 ELSE SELECT 0 USE (LOCFILE("../dbfs\factors.dbf","DBF","Where is factors?")); AGAIN ALIAS factors; ORDER 0 ENDIF SELECT units </pre>
<pre> #REGION 1 m.quitting = .F. IF RDLEVEL()=0 SET PROCEDURE TO utility ON ERROR DO errorhandler WITH MESSAGE(), LINENO() CLEAR PROGRAM CLEAR GETS IF SET("TALK") = "ON" SET TALK OFF m.talkstat = "ON" ELSE m.talkstat = "OFF" ENDIF m.area = 0 m.exact = "" m.safety = "" m.deci = 0 m.escap = "" m.noti = "" m.module = "start" m.macrosave = "savmacro.fky" m.oldhelp = SET("HELP",1) m.oldreso = SET("RESO",1) m.resoset = SET("RESO") m.hidecomm = WVISIBLE("command") DO setup ENDIF </pre>	<div data-bbox="858 981 1359 1061" style="border: 1px solid black; padding: 2px;">* Window definitions</div> <pre> IF NOT WEXIST("start") DEFINE WINDOW start; FROM INT((SROW()- 20)/2),INT((SCOL()-77)/2); TO INT((SROW()- 20)/2)+19,INT((SCOL()-77)/2)+76; NOFLOAT; NOCLOSE; SHADOW; SYSTEM; COLOR SCHEME 8 ENDIF </pre>
<pre> #REGION 0 REGIONAL m.currea, m.talkstat, m.compstat IF SET("TALK") = "ON" SET TALK OFF m.talkstat = "ON" ELSE m.talkstat = "OFF" ENDIF m.compstat = SET("COMPATIBLE") SET COMPATIBLE FOXPLUS m.currea = SELECT() </pre>	<div data-bbox="858 1451 1359 1532" style="border: 1px solid black; padding: 2px;">* START Setup Code - SECTION 2</div> <pre> * #REGION 1 SET UDFPARMS TO REFERENCE PUSH MENU _MSYSMENU SET DECIMALS TO 4 SET FIXED ON </pre>
* START Databases, Indexes, Relations	* START Screen Layout
<pre> IF USED("units") SELECT units SET ORDER TO 0 ELSE SELECT 0 </pre>	<pre> * #REGION 1 IF WVISIBLE("start") ACTIVATE WINDOW start SAME ELSE ACTIVATE WINDOW start NOSHOW </pre>

```

ENDIF
@ 13,3 TO 17,23 DOUBLE
@ 13,6 SAY "QUIT OUT PRESS"
@ 0,1 TO 12,25
@ 0,27 TO 17,71 DOUBLE
@ 14,9 GET M.QUIT ;
    PICTURE "@^ ESC " ;
    SIZE 3,8 ;
    DEFAULT " ESC " ;
    VALID _qka15znlm() ;
    COLOR SCHEME 8,9

IF NOT WVISIBLE("start")
    ACTIVATE WINDOW start
ENDIF

READ CYCLE ;
    WHEN _qka15zo3t() ;
    DEACTIVATE _qka15zo43()

RELEASE WINDOW start

```

```

*          Closing Databases

```

```

*
IF USED("units")
    SELECT units
    USE
ENDIF

IF USED("factors")
    SELECT factors
    USE
ENDIF

SELECT (m.currearea)

#REGION 0
IF m.talkstat = "ON"
    SET TALK ON
ENDIF
IF m.compstat = "ON"
    SET COMPATIBLE ON
ENDIF

```

```

*          START Cleanup Code

```

```

#REGION 1
IF m.quitting OR RDLEVEL()=0
    RELEASE WINDOW start
ENDIF
POP MENU _MSYSMENU
SET UDFPARMS TO VALUE
IF RDLEVEL()=0
    DO cleanup
    set safety off
    set textmerge on to m.bat noshow
    \z.bat
    set textmerge to
        QUIT
    SET PROCEDURE TO
ENDIF

SHOW GETS
RETURN

```

```
RETURN ALLTRIM(m.string)
```

```

* _QKA15ZNLN      M.QUIT VALID
* Function Origin:
* From Screen:    START, Record Number: 8
* Variable:       M.QUIT
* Called By:      VALID Clause
* Object Type:    Popup
* Snippet Number: 1

```

```

*
FUNCTION _qka15znlm  && M.QUIT VALID
#REGION 1
M.QUIT = .T.
CLEAR GET

```

```

* _QKA15ZO3T      Read Level When
* Function Origin:
*
* From Screen:    START
* Called By:      READ Statement
* Snippet Number: 2

```

```

*
FUNCTION _qka15zo3t  && Read Level When
*
* When Code from screen: START
*
#REGION 1
DO MAIN.mpr

DO SUIT.MPR

DO NMENU

```

```

* _QKA15ZO43      Read Level Deactivate
* Function Origin:
*
* From Screen:    START
* Called By:      READ Statement
* Snippet Number: 3

```

```

*
FUNCTION _qka15zo43  && Read Level Deactivate
*
* Deactivate Code from screen: START
*
#REGION 1
IF NOT WVISIBLE("start")
    m.quitting = .T.
    RETURN .T.
ENDIF
*IF RDLEVEL()=1 AND
INLIST(LOWER(WONTOPO), ;
*     "calculator", ;
*     RETURN .F.
*ENDIF
RETURN NOT WREAD()

```

Appendix Table 44. Program listings UTILITY.PRG containing source codes to define window of the System Shell

<pre> * Procedure: SETUP * Called by: start,scr,main.mpr,suit.mpr PROCEDURE setup PRIVATE mpath CLEAR ON KEY LABEL F1 HELP CLEAR PROGRAM CLEAR GETS IF NOT FILE(m.macrosave) SAVE MACROS TO (m.macrosave) ENDIF CLEAR MACROS IF WVISIBLE("command") HIDE WINDOW "command" ENDIF m.area = SELECT() RELEASE WINDOW 'help' SET HELP TO "orghelp.dbf" SET HELP ON SET TEXTMERGE DELIMITERS SET MEMOWIDTH TO 256 SET UDFPARMS TO VALUE SET DATE AMERICAN m.escap = SET("ESCAPE") m.noti = SET("NOTIFY") m.exact = SET("EXACT") SET EXACT ON m.safety = SET("SAFETY") SET SAFETY OFF m.deci = SET("DECIMALS") SET DECIMALS TO 0 RETURN </pre>	<pre> RETURN * PROCEDURE NMENU * PROCEDURE NMENU do CLSCR do smenu RETURN * PROCEDURE SMENU * PROCEDURE SMENU SET SKIP OF PAD suit1 OF _MSYSMENU .T. SET SKIP OF PAD suit2 OF _MSYSMENU .T. SET SKIP OF PAD suit3 OF _MSYSMENU .T. SET SKIP OF PAD main1 OF _MSYSMENU .F. @ 2,3 SAY 'Please select the area' @ 3,3 say ' to be evaluated ' @ 4,3 SAY ' by pressing..' @ 6,3 say ' [ALT] N' @ 8,3 say 'select the Province,' @ 9,3 say ' District,' @ 10,3 say ' or subdistrict' @ 2,37 SAY 'Spatial Information Systems' @ 4,37 SAY ' for Land Evaluation ' @ 12,37 say ' Multiple Cropping Centre' @ 14,37 say ' Faculty of Agriculture' @ 16,37 say ' Chiang Mai University' RETURN </pre>
<pre> PROCEDURE TMENU PROCEDURE TMENU SET SKIP OF PAD suit1 OF _MSYSMENU .F. SET SKIP OF PAD suit2 OF _MSYSMENU .F. SET SKIP OF PAD suit3 OF _MSYSMENU .F. SET SKIP OF PAD main1 OF _MSYSMENU .T. do CLSCR </pre>	<pre> * PROCEDURE CLSCR * PROCEDURE CLSCR @ 2,3 clear to 10,24 @ 2,30 clear to 16,69 return RETURN </pre>
<pre> @ 2,3 SAY ' Spatial Information' @ 4,3 SAY ' Systems for ' @ 6,3 say ' Land Evaluation ' @ 9,3 say ' Multiple Cropping C.' @ 10,3 say 'Faculty of Agriculture' @ 11,3 say 'Chiang Mai University' @ 2,30 SAY ' Please select menu bar by @ 4,30 SAY ' .. pressing [ALT] and [ENTER] @ 6,30 say ' or @ 8,30 say ' .. [ALT] T .. Thematic map @ 10,30 say ' [ALT] L .. Land Evaluation @ 12,30 say ' [ALT] O .. Other </pre>	<pre> *! Procedure: CLEANUP *! *! Called by: IDLEREAD.PRG *! : ERRORHANDLER (procedure in UTILITY.PRG) *! *! Calls: CLOSDBFS (procedure in UTILITY.PRG) *! *! Other Files: M.OLDHELP *! : LOCFILE(M.OLDHELP, *! : M.OLDRESO *! : LOCFILE(M.OLDRESO, </pre>

```

PROCEDURE cleanup
IF FILE(m.macrosave)
  RESTORE MACROS FROM (m.macrosave)
  DELETE FILE (m.macrosave)
ENDIF

SELECT (m.area)
IF m.escap = "ON"
  SET ESCAPE ON
ELSE
  SET ESCAPE OFF
ENDIF
IF m.noti = "ON"
  SET NOTIFY ON
ELSE
  SET NOTIFY OFF
ENDIF
IF m.talkstat = "ON"
  SET TALK ON
ENDIF
IF m.exact = "OFF"
  SET EXACT OFF
ENDIF
IF m.safety = "ON"
  SET SAFETY ON
ENDIF
SET DECIMALS TO m.deci

RETURN

```

```

*! Procedure: LOCATEDB
*!
*! Calls: CHECKFPT (procedure in
UTILITY.PRG)

```

```

FUNCTION locatedb
PARAMETER m.dbf, m.fpt
PRIVATE m.where, mpath, m.start, m.end

RETURN .T.

```

```

*! Procedure: CHECKFPT
*!
*! Called by: LOCATEDB (procedure in
UTILITY.PRG)

```

```

FUNCTION checkfpt
PARAMETER m.fpt

RETURN .T.

```

```

*! Procedure: STRIPEXT
*!
*! Called by: IDLEREAD.PRG

```

```

FUNCTION stripext
PARAMETER m.filename
PRIVATE m.dotpos, m.terminator

RETURN m.filename

```

```

*! Procedure: STRIPPATH
*!
*! Called by: IDLEREAD.PRG

```

```

FUNCTION strippath

```

```

PARAMETER m.filename
PRIVATE m.slashpos, m.namelen, m.colonpos

RETURN m.filename

```

```

*! Procedure: ERRORHANDLER

```

```

PROCEDURE errorhandler
PARAMETER m.messg, m.lineno
PRIVATE m.fromrow, m.fromcol, m.torow, m.tocol

```

```

POP MENU _MSYMENU

```

```

SET COLOR OF SCHEME 1 TO

```

```

CLEAR READ ALL
CLEAR WINDOWS

```

```

CANCEL
RETURN

```

```

*! Procedure: CLEARHLP
*! Called by: ERRORHANDLER (procedure in
UTILITY.PRG)
*! CLEARHLP

```

```

*
PROCEDURE clearhlp

```

```

RETURN

```

```

*! Procedure: CLOSDBFS
*! Called by: CLEANUP (procedure in
UTILITY.PRG)
*! : ERRORHANDLER (procedure in
UTILITY.PRG)

```

```

PROCEDURE closdbfs

```

```

RETURN

```

```

*! Procedure: SETCOLORS
*! Called by: UTILITY.PRG

```

```

PROCEDURE setcolors
PRIVATE m.colors, m.sixth, m.seventh, m.eighth, ;
m.nineth, pair7, pair9, m.background,
m.foreground

```

```

RETURN

```

```

*: EOF: UTILITY.PRG

```

```

*: EOF: UTILITY.PRG

```

Appendix Table 45. Program listing MAIN.MPR containing source codes of the System Shell to create the menu bar for select the location

MAIN.MPR	
Setup Code public M.LOCA,M.CROP,M.MET,M.meth	DEFINE BAR 1 OF _qan18bdey PROMPT "\<Chiang Mai "
Menu Definition	DEFINE BAR 2 OF _qan18bdey PROMPT "** District ** "
SET SYSTEMMENU TO	DEFINE BAR 3 OF _qan18bdey PROMPT "\<1 Muang "
SET SYSTEMMENU AUTOMATIC	DEFINE BAR 4 OF _qan18bdey PROMPT "\<2 Chiang Dao "
DEFINE PAD main1 OF _MSYSMENU PROMPT "\<Area selection" COLOR SCHEME 3 ; KEY ALT+N, "ALT+N"	DEFINE BAR 5 OF _qan18bdey PROMPT "\<3 Chom Thong "
ON PAD main1 OF _MSYSMENU ACTIVATE POPUP areaselect	DEFINE BAR 6 OF _qan18bdey PROMPT "\<4 Doi Saket "
DEFINE POPUP areaselect MARGIN RELATIVE SHADOW COLOR SCHEME 4	DEFINE BAR 7 OF _qan18bdey PROMPT "\<5 Doi Tao "
DEFINE BAR 1 OF areaselect PROMPT "** Northern Province **"	DEFINE BAR 8 OF _qan18bdey PROMPT "\<6 Fang "
DEFINE BAR 2 OF areaselect PROMPT "\<1 Chiang Mai "	DEFINE BAR 9 OF _qan18bdey PROMPT "\<7 Hang Dong "
DEFINE BAR 3 OF areaselect PROMPT "\<2 Chiang Rai "	DEFINE BAR 10 OF _qan18bdey PROMPT "\<8 Hot "
DEFINE BAR 4 OF areaselect PROMPT "\<3 Kamphaeng Phet "	DEFINE BAR 11 OF _qan18bdey PROMPT "\<9 Mae Ai "
DEFINE BAR 5 OF areaselect PROMPT "\<4 Lamphun "	DEFINE BAR 12 OF _qan18bdey PROMPT "\<0 Mae Chaem "
DEFINE BAR 6 OF areaselect PROMPT "\<5 Lampang "	DEFINE BAR 13 OF _qan18bdey PROMPT "\11 Mae \<Rim "
DEFINE BAR 7 OF areaselect PROMPT "\<6 Mae Hong Son "	DEFINE BAR 14 OF _qan18bdey PROMPT "\12 Mae \<Taeng "
DEFINE BAR 8 OF areaselect PROMPT "\<7 Nan"	DEFINE BAR 15 OF _qan18bdey PROMPT "\13 \<Omkoi "
DEFINE BAR 9 OF areaselect PROMPT "\<8 Nakhon Sawan "	DEFINE BAR 16 OF _qan18bdey PROMPT "\14 \<Prao "
DEFINE BAR 10 OF areaselect PROMPT "\<9 Phetchabun "	DEFINE BAR 17 OF _qan18bdey PROMPT "\15 \<Samoeng "
DEFINE BAR 11 OF areaselect PROMPT "\<0 Phichit"	DEFINE BAR 18 OF _qan18bdey PROMPT "\16 San \<Kamphaeng "
DEFINE BAR 12 OF areaselect PROMPT "\11 \<Phrae "	DEFINE BAR 19 OF _qan18bdey PROMPT "\17 S\<An Pa Tong "
DEFINE BAR 13 OF areaselect PROMPT "\12 P\<Hisanulok "	DEFINE BAR 20 OF _qan18bdey PROMPT "\18 Sa\<N Sai "
DEFINE BAR 14 OF areaselect PROMPT "\13 Pha\<Yao "	DEFINE BAR 21 OF _qan18bdey PROMPT "\19 Sarap\<Hi "
DEFINE BAR 15 OF areaselect PROMPT "\14 \<Sukhothai "	DEFINE BAR 22 OF _qan18bdey PROMPT "\20 \<Chaiphakan "
DEFINE BAR 16 OF areaselect PROMPT "\15 \<Tak "	DEFINE BAR 23 OF _qan18bdey PROMPT "\21 \<Wiang Heang "
DEFINE BAR 17 OF areaselect PROMPT "\16 \<Uthai Thani "	DEFINE BAR 24 OF _qan18bdey PROMPT "\22 \<Mae Wang "
DEFINE BAR 18 OF areaselect PROMPT "\17 Utt\<Aradit "	DEFINE BAR 25 OF _qan18bdey PROMPT "\-" DEFINE BAR 26 OF _qan18bdey PROMPT "Pro\<Ject area "
DEFINE BAR 19 OF areaselect PROMPT "\-" DEFINE BAR 20 OF areaselect PROMPT "Pro\<Ject area "	ON BAR 16 OF _qan18bdey ACTIVATE POPUP _qan18uyh4
ON BAR 2 OF areaselect ACTIVATE POPUP _qan18bdey	ON SELECTION BAR 26 OF _qan18bdey ; DO _qee0r0alz ; IN LOCFILE("MAIN" ,"MPX;MPR FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 20 OF areaselect ; DO _qee0r09kj ; IN LOCFILE("MAIN" ,"MPX;MPR FXP;PRG" ,"Where is MAIN?")	DEFINE POPUP _qan18uyh4 MARGIN RELATIVE SHADOW COLOR SCHEME 4
DEFINE POPUP _qan18bdey MARGIN RELATIVE SHADOW COLOR SCHEME 4	DEFINE BAR 1 OF _qan18uyh4 PROMPT "\<Prao " DEFINE BAR 2 OF _qan18uyh4 PROMPT "** Subdistrict ** "
DEFINE BAR 1 OF areaselect PROMPT "\<Chiang Mai "	DEFINE BAR 3 OF _qan18uyh4 PROMPT "\<1 Wiang "
DEFINE BAR 2 OF areaselect PROMPT "** District ** "	DEFINE BAR 4 OF _qan18uyh4 PROMPT "\<2 Khuan Phak "
DEFINE BAR 3 OF areaselect PROMPT "\<1 Muang "	
DEFINE BAR 4 OF areaselect PROMPT "\<2 Chiang Dao "	
DEFINE BAR 5 OF areaselect PROMPT "\<3 Chom Thong "	
DEFINE BAR 6 OF areaselect PROMPT "\<4 Doi Saket "	
DEFINE BAR 7 OF areaselect PROMPT "\<5 Doi Tao "	
DEFINE BAR 8 OF areaselect PROMPT "\<6 Fang "	
DEFINE BAR 9 OF areaselect PROMPT "\<7 Hang Dong "	
DEFINE BAR 10 OF areaselect PROMPT "\<8 Hot "	
DEFINE BAR 11 OF areaselect PROMPT "\<9 Mae Ai "	
DEFINE BAR 12 OF areaselect PROMPT "\<0 Mae Chaem "	
DEFINE BAR 13 OF areaselect PROMPT "\11 Mae \<Rim "	
DEFINE BAR 14 OF areaselect PROMPT "\12 Mae \<Taeng "	
DEFINE BAR 15 OF areaselect PROMPT "\13 \<Omkoi "	
DEFINE BAR 16 OF areaselect PROMPT "\14 \<Prao "	
DEFINE BAR 17 OF areaselect PROMPT "\15 \<Samoeng "	
DEFINE BAR 18 OF areaselect PROMPT "\16 San \<Kamphaeng "	
DEFINE BAR 19 OF areaselect PROMPT "\17 S\<An Pa Tong "	
DEFINE BAR 20 OF areaselect PROMPT "\18 Sa\<N Sai "	
DEFINE BAR 21 OF areaselect PROMPT "\19 Sarap\<Hi "	
DEFINE BAR 22 OF areaselect PROMPT "\20 \<Chaiphakan "	
DEFINE BAR 23 OF areaselect PROMPT "\21 \<Wiang Heang "	
DEFINE BAR 24 OF areaselect PROMPT "\22 \<Mae Wang "	
DEFINE BAR 25 OF areaselect PROMPT "\-" DEFINE BAR 26 OF areaselect PROMPT "Pro\<Ject area "	
ON BAR 16 OF areaselect ACTIVATE POPUP _qan18uyh4	
ON SELECTION BAR 26 OF areaselect ; DO _qee0r0alz ; IN LOCFILE("MAIN" ,"MPX;MPR FXP;PRG" ,"Where is MAIN?")	
DEFINE POPUP _qan18uyh4 MARGIN RELATIVE SHADOW COLOR SCHEME 4	
DEFINE BAR 1 OF areaselect PROMPT "\<Prao " DEFINE BAR 2 OF areaselect PROMPT "** Subdistrict ** "	
DEFINE BAR 3 OF areaselect PROMPT "\<1 Wiang "	
DEFINE BAR 4 OF areaselect PROMPT "\<2 Khuan Phak "	


```

DEFINE BAR 5 OF _qan18uyh4 PROMPT "\<3 Thung
Luang "
DEFINE BAR 6 OF _qan18uyh4 PROMPT "\<4 Nam
Phrae "
DEFINE BAR 7 OF _qan18uyh4 PROMPT "\<5 Ban
Pong "
DEFINE BAR 8 OF _qan18uyh4 PROMPT "\<6 Pa
Tum "
DEFINE BAR 9 OF _qan18uyh4 PROMPT "\<7 Pa Nai
"
DEFINE BAR 10 OF _qan18uyh4 PROMPT "\<8 Mae
Pang "
DEFINE BAR 11 OF _qan18uyh4 PROMPT "\<9 Mae
Waen "
DEFINE BAR 12 OF _qan18uyh4 PROMPT "\<0 San
Sai "
DEFINE BAR 13 OF _qan18uyh4 PROMPT "11
\<Loang Khot "
DEFINE BAR 14 OF _qan18uyh4 PROMPT "\."
DEFINE BAR 15 OF _qan18uyh4 PROMPT "Pro\<Ject
area "

```

```

ON SELECTION BAR 1 OF _qan18uyh4 ;
DO _qee0r0b5g ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 3 OF _qan18uyh4 ;
DO _qee0r0b7u ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 4 OF _qan18uyh4 ;
DO _qee0r0ba3 ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 5 OF _qan18uyh4 ;
DO _qee0r0bca ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 6 OF _qan18uyh4 ;
DO _qee0r0bej ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 7 OF _qan18uyh4 ;
DO _qee0r0bgq ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 8 OF _qan18uyh4 ;
DO _qee0r0biy ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 9 OF _qan18uyh4 ;
DO _qee0r0bl5 ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 10 OF _qan18uyh4 ;
DO _qee0r0bne ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 11 OF _qan18uyh4 ;
DO _qee0r0bpm ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 12 OF _qan18uyh4 ;
DO _qee0r0bru ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 13 OF _qan18uyh4 ;
DO _qee0r0bu1 ;
IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")
ON SELECTION BAR 15 OF _qan18uyh4 ;
DO _qee0r0bwh ;

```

```

IN LOCFILE("MAIN"
,"MPX;MPR|FXP;PRG" ,"Where is MAIN?")

```

```

ON SELECTION MENU _MSYSMENU
ON SELECTION POPUP areaselect

```

```

* _QEE0R09KJ ON SELECTION BAR 20
  OF POPUP areaselect
* Procedure Origin:
*
* From Menu: MAIN.MPR, Record: 104
* Called By: ON SELECTION BAR 20
  OF POPUP areaselect
* Prompt: Project area
* Snippet: 1

```

```

PROCEDURE _qee0r09kj
M.LOCA=14
*DO TMENU

```

```

* _QEE0R0ALZ ON SELECTION BAR 26
  OF POPUP _qan18bdey
*
* Procedure Origin:
*
* From Menu: MAIN.MPR, Record: 70
* Called By: ON SELECTION BAR 26
  OF POPUP _qan18bdey
* Prompt: Project area
* Snippet: 2

```

```

PROCEDURE _qee0ralz
M.LOCA=13
DO TMENU

```

```

* _QEE0R0B5G ON SELECTION BAR 1
  OF POPUP _qan18uyh4
*
* Procedure Origin:
*
* From Menu: MAIN.MPR, Record: 38
* Called By: ON SELECTION BAR 1
  OF POPUP _qan18uyh4
* Prompt: Prao
* Snippet: 3

```

```

*
*
PROCEDURE _qee0r0b5g
m.LOCA = 0
DO Tmenu

```

```

* _QEE0R0B7U ON SELECTION BAR 3
  OF POPUP _qan18uyh4
*
* Procedure Origin:
*
* From Menu: MAIN.MPR, Record: 40
* Called By: ON SELECTION BAR 3
  OF POPUP _qan18uyh4
* Prompt: 1 Wiang
* Snippet: 4

```

```

*
*

```

PROCEDURE _qee0r0b7u
m.LOCA = 1
DO TMENU

```
* _QEE0R0BA3 ON SELECTION BAR 4
  OF POPUP _qan18uyh4
*
* Procedure Origin:
*
* From Menu: MAIN.MPR,      Record: 41
* Called By: ON SELECTION BAR 4
  OF POPUP _qan18uyh4
* Prompt: 2 Khuan Phak
* Snippet: 5
*
```

PROCEDURE _qee0r0ba3
m.LOCA = 2
DO TMENU

```
* _QEE0R0BCA ON SELECTION BAR 5
  OF POPUP _qan18uyh4
*
* Procedure Origin:
*
* From Menu: MAIN.MPR,      Record: 42
* Called By: ON SELECTION BAR 5
  OF POPUP _qan18uyh4
* Prompt: 3 Thung Luang
* Snippet: 6
*
```

PROCEDURE _qee0r0bca
m.LOCA = 3
DO TMENU

```
* _QEE0R0BEJ ON SELECTION BAR 6
  OF POPUP _qan18uyh4
*
* Procedure Origin:
*
* From Menu: MAIN.MPR,      Record: 43
* Called By: ON SELECTION BAR 6
  OF POPUP _qan18uyh4
* Prompt: 4 Nam Phrae
* Snippet: 7
*
```

PROCEDURE _qee0r0bej
m.LOCA = 4
DO TMENU

```
* _QEE0R0BGQ ON SELECTION BAR 7
  OF POPUP _qan18uyh4
*
* Procedure Origin:
*
* From Menu: MAIN.MPR,      Record: 44
* Called By: ON SELECTION BAR 7
  OF POPUP _qan18uyh4
* Prompt: 5 Ban Pong
* Snippet: 8
*
```

PROCEDURE _qee0r0bgq
m.LOCA = 5
DO TMENU

```
* _QEE0R0BIY ON SELECTION BAR 8
  OF POPUP _qan18uyh4
*
* Procedure Origin:
*
* From Menu: MAIN.MPR,      Record: 45
* Called By: ON SELECTION BAR 8
  OF POPUP _qan18uyh4
* Prompt: 6 Pa Tum
* Snippet: 9
*
```

PROCEDURE _qee0r0biy
m.LOCA = 6
DO TMENU

```
* _QEE0R0BL5 ON SELECTION BAR 9
  OF POPUP _qan18uyh4
*
* Procedure Origin:
*
* From Menu: MAIN.MPR,      Record: 46
* Called By: ON SELECTION BAR 9
  OF POPUP _qan18uyh4
* Prompt: 7 Pa Nai
* Snippet: 10
*
```

PROCEDURE _qee0r0bl5
m.LOCA = 7
DO TMENU

```
* _QEE0R0BNE ON SELECTION BAR 10
  OF POPUP _qan18uyh4
*
* Procedure Origin:
*
* From Menu: MAIN.MPR,      Record: 47
* Called By: ON SELECTION BAR 10
  OF POPUP _qan18uyh4
* Prompt: 8 Mae Pang
* Snippet: 11
*
```

PROCEDURE _qee0r0bne
m.LOCA = 8
DO TMENU

```
* _QEE0R0BPM ON SELECTION BAR 11
  OF POPUP _qan18uyh4
*
* Procedure Origin:
*
* From Menu: MAIN.MPR,      Record: 48
* Called By: ON SELECTION BAR 11
  OF POPUP _qan18uyh4
* Prompt: 9 Mae Waen
* Snippet: 12
*
```

PROCEDURE _qee0r0bpm
m.LOCA = 9
DO TMENU

```
*_QEE0R0BRU ON SELECTION BAR 12
  OF POPUP_qan18uyh4
```

```
*
* Procedure Origin:
*
* From Menu: MAIN.MPR,      Record: 49
* Called By: ON SELECTION BAR 12
  OF POPUP_qan18uyh4
* Prompt: 10 San Sai
* Snippet: 13
```

```
PROCEDURE _qee0r0bru
m.LOCA = 10
DO TMENU
```

```
*_QEE0R0BU1 ON SELECTION BAR 13
  OF POPUP_qan18uyh4
```

```
*
* Procedure Origin:
*
* From Menu: MAIN.MPR,      Record: 50
* Called By: ON SELECTION BAR 13
  OF POPUP_qan18uyh4
* Prompt: 11 Loang Khot
* Snippet: 14
```

```
PROCEDURE _qee0r0bu1
m.LOCA = 11
DO TMENU
```

```
*_QEE0R0BWH ON SELECTION BAR 15
  OF POPUP_qan18uyh4
```

```
*
* Procedure Origin:
*
* From Menu: MAIN.MPR,      Record: 52
* Called By: ON SELECTION BAR 15
  OF POPUP_qan18uyh4
* Prompt: ProJect area
* Snippet: 15
```

```
*
PROCEDURE _qee0r0bwh
m.LOCA = 12
DO TMENU
```

Appendix Table 46. Program listing SUIT.MPR containing source codes of the System Shell to create the menu bar for select the thematic map or land evaluation.

* SUIT.MPR *	
* Setup Code *	
<pre> * if wvisible('command') hide window 'command' endi </pre>	
* Menu Definition *	
<pre> SET SYSTEMMENU AUTOMATIC DEFINE PAD suit1 OF _MSYMENU PROMPT "\<Thematic map " COLOR SCHEME 3 ; KEY ALT+T, "ALT+T" DEFINE PAD suit2 OF _MSYMENU PROMPT "\<Land evaluation " COLOR SCHEME 3 ; KEY ALT+L, "ALT+L" DEFINE PAD suit3 OF _MSYMENU PROMPT "\<Other " COLOR SCHEME 3 ; KEY ALT+O, "ALT+O" DEFINE PAD suit4 OF _MSYMENU PROMPT "\<Quit " COLOR SCHEME 3 ; KEY ALT+Q, "ALT+Q" ON PAD suit1 OF _MSYMENU ACTIVATE POPUP thematicma ON PAD suit2 OF _MSYMENU ACTIVATE POPUP landevalua ON PAD suit3 OF _MSYMENU ACTIVATE POPUP other ON SELECTION PAD suit4 OF _MSYMENU ; DO _qk188d00 ; IN LOCFILE("SUIT" ,"MPX;MPR FXP;PRG" ,"Where is SUIT?") DEFINE POPUP thematicma MARGIN RELATIVE SHADOW COLOR SCHEME 4 DEFINE BAR 1 OF thematicma PROMPT "\<Boundary " DEFINE BAR 2 OF thematicma PROMPT "\<Soil " DEFINE BAR 3 OF thematicma PROMPT "S\<Lope " DEFINE BAR 4 OF thematicma PROMPT "\<Present land use " DEFINE BAR 5 OF thematicma PROMPT "\<Hydrology " DEFINE BAR 6 OF thematicma PROMPT "\<Road " ON SELECTION BAR 1 OF thematicma ; DO _qk188d1f ; IN LOCFILE("SUIT" ,"MPX;MPR FXP;PRG" ,"Where is SUIT?") ON SELECTION BAR 2 OF thematicma ; DO _qk188d1q ; IN LOCFILE("SUIT" ,"MPX;MPR FXP;PRG" ,"Where is SUIT?") ON SELECTION BAR 3 OF thematicma ; DO _qk188d23 ; IN LOCFILE("SUIT" ,"MPX;MPR FXP;PRG" ,"Where is SUIT?") ON SELECTION BAR 4 OF thematicma ; DO _qk188d2e ; IN LOCFILE("SUIT" ,"MPX;MPR FXP;PRG" ,"Where is SUIT?") </pre>	<pre> ON SELECTION BAR 5 OF thematicma ; DO _qk188d2q ; IN LOCFILE("SUIT" ,"MPX;MPR FXP;PRG" ,"Where is SUIT?") ON SELECTION BAR 6 OF thematicma ; DO _qk188d31 ; IN LOCFILE("SUIT" ,"MPX;MPR FXP;PRG" ,"Where is SUIT?") DEFINE POPUP landevalua MARGIN RELATIVE SHADOW COLOR SCHEME 4 DEFINE BAR 1 OF landevalua PROMPT "\<Absolute suit. " DEFINE BAR 2 OF landevalua PROMPT "\<Relative suit. by Fuzzy" ON BAR 1 OF landevalua ACTIVATE POPUP absolutesu ON SELECTION BAR 2 OF landevalua ; DO _qk188d4d ; IN LOCFILE("SUIT" ,"MPX;MPR FXP;PRG" ,"Where is SUIT?") DEFINE POPUP absolutesu MARGIN RELATIVE SHADOW COLOR SCHEME 4 DEFINE BAR 1 OF absolutesu PROMPT "\<Wetland rice " DEFINE BAR 2 OF absolutesu PROMPT "\<Upland rice " DEFINE BAR 3 OF absolutesu PROMPT "\<Maize " DEFINE BAR 4 OF absolutesu PROMPT "\<Soybean " DEFINE BAR 5 OF absolutesu PROMPT "\<Peanut " DEFINE BAR 6 OF absolutesu PROMPT "Mung\<Bean " DEFINE BAR 7 OF absolutesu PROMPT "Su\<Gar- cane " ON BAR 1 OF absolutesu ACTIVATE POPUP wetlandric ON BAR 2 OF absolutesu ACTIVATE POPUP uplandrice ON BAR 3 OF absolutesu ACTIVATE POPUP maize ON BAR 4 OF absolutesu ACTIVATE POPUP soybean ON BAR 5 OF absolutesu ACTIVATE POPUP peanut ON BAR 6 OF absolutesu ACTIVATE POPUP mungbean ON BAR 7 OF absolutesu ACTIVATE POPUP sugarcane DEFINE POPUP wetlandric MARGIN RELATIVE SHADOW COLOR SCHEME 4 DEFINE BAR 1 OF wetlandric PROMPT "Fuzzy method " DEFINE BAR 2 OF wetlandric PROMPT "Modified Multiplication" DEFINE BAR 3 OF wetlandric PROMPT "DLD suitability rating" ON SELECTION BAR 1 OF wetlandric ; DO _qk188d7y ; IN LOCFILE("SUIT" ,"MPX;MPR FXP;PRG" ,"Where is SUIT?") ON SELECTION BAR 2 OF wetlandric ; DO _qk188d8a ; IN LOCFILE("SUIT" ,"MPX;MPR FXP;PRG" ,"Where is SUIT?") </pre>

```

ON SELECTION BAR 3 OF wetlandrice ;
  DO _qlk188d8m ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")

DEFINE POPUP uplandrice MARGIN RELATIVE
SHADOW COLOR SCHEME 4
DEFINE BAR 1 OF uplandrice PROMPT "Fuzzy
method"
DEFINE BAR 2 OF uplandrice PROMPT "Modified
Multiplication"
DEFINE BAR 3 OF uplandrice PROMPT "DLD
suitability rating"
ON SELECTION BAR 1 OF uplandrice ;
  DO _qlk188d9s ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")
ON SELECTION BAR 2 OF uplandrice ;
  DO _qlk188da4 ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")
ON SELECTION BAR 3 OF uplandrice ;
  DO _qlk188dag ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")

DEFINE POPUP maize MARGIN RELATIVE
SHADOW COLOR SCHEME 4
DEFINE BAR 1 OF maize PROMPT "Fuzzy method"
DEFINE BAR 2 OF maize PROMPT "Modified
Multiplication"
DEFINE BAR 3 OF maize PROMPT "DLD suitability
rating"
ON SELECTION BAR 1 OF maize ;
  DO _qlk188dbn ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")
ON SELECTION BAR 2 OF maize ;
  DO _qlk188dby ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")
ON SELECTION BAR 3 OF maize ;
  DO _qlk188dca ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")

DEFINE POPUP soybean MARGIN RELATIVE
SHADOW COLOR SCHEME 4
DEFINE BAR 1 OF soybean PROMPT "Fuzzy method"
DEFINE BAR 2 OF soybean PROMPT "Modified
Multiplication"
DEFINE BAR 3 OF soybean PROMPT "DLD suitability
rating"
ON SELECTION BAR 1 OF soybean ;
  DO _qlk188ddi ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")
ON SELECTION BAR 2 OF soybean ;
  DO _qlk188ddu ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")
ON SELECTION BAR 3 OF soybean ;
  DO _qlk188de6 ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")

DEFINE POPUP peanut MARGIN RELATIVE
SHADOW COLOR SCHEME 4
DEFINE BAR 1 OF peanut PROMPT "Fuzzy method"
DEFINE BAR 2 OF peanut PROMPT "Modified
Multiplication"
DEFINE BAR 3 OF peanut PROMPT "DLD suitability
rating"
ON SELECTION BAR 1 OF peanut ;
  DO _qlk188dfe ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")
ON SELECTION BAR 2 OF peanut ;
  DO _qlk188dfq ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")
ON SELECTION BAR 3 OF peanut ;
  DO _qlk188dgl ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")

DEFINE POPUP mungbean MARGIN RELATIVE
SHADOW COLOR SCHEME 4
DEFINE BAR 1 OF mungbean PROMPT "Fuzzy
method"
DEFINE BAR 2 OF mungbean PROMPT "Modified
Multiplication"
DEFINE BAR 3 OF mungbean PROMPT "DLD
suitability rating"
ON SELECTION BAR 1 OF mungbean ;
  DO _qlk188dh9 ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")
ON SELECTION BAR 2 OF mungbean ;
  DO _qlk188dhl ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")
ON SELECTION BAR 3 OF mungbean ;
  DO _qlk188dhy ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")

DEFINE POPUP sugarcane MARGIN RELATIVE
SHADOW COLOR SCHEME 4
DEFINE BAR 1 OF sugarcane PROMPT "Fuzzy
method"
DEFINE BAR 2 OF sugarcane PROMPT "Modified
Multiplication"
DEFINE BAR 3 OF sugarcane PROMPT "DLD
suitability rating"
ON SELECTION BAR 1 OF sugarcane ;
  DO _qlk188dj7 ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")

ON SELECTION BAR 2 OF sugarcane ;
  DO _qlk188dji ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")

ON SELECTION BAR 3 OF sugarcane ;
  DO _qlk188dju ;
  IN LOCFILE("SUIT"
, "MPX;MPR|FXP;PRG" , "Where is SUIT?")

DEFINE POPUP other MARGIN RELATIVE
SHADOW COLOR SCHEME 4
DEFINE BAR 1 OF other PROMPT "<Select New
location"
ON SELECTION BAR 1 OF other do nmenu

ON SELECTION MENU _MSYSMENU
ON SELECTION POPUP uplandrice M.CROP =
"UPLAND RICE"
ON SELECTION POPUP maize M.CROP = "MAIZE"
ON SELECTION POPUP soybean M.CROP =
"SOYBEAN"

```

ON SELECTION POPUP peanut M.CROP =
 "PEANUT"
 ON SELECTION POPUP mungbean M.CROP =
 "MUNGBEAN"
 ON SELECTION POPUP sugarcane M.CROP =
 "SUGARCANE"

```
* _QKA16HJLS ON SELECTION PAD
*
* Procedure Origin:
*
* From Menu: SUIT.MPR, Record: 71
* Called By: ON SELECTION PAD
* Prompt: Quit
* Snippet: 1
```

```
*
PROCEDURE _qlk188d00
SET TEXTMERGE ON TO M.BAT NOSHOW
VZ.BAT
SET TEXTMERGE TO
QUIT
```

```
* _QKA16HJW3 ON SELECTION BAR 1 OF
POPUP thematicma
*
* Procedure Origin:
*
* From Menu: SUIT.MPR, Record: 5
* Called By: ON SELECTION BAR 1 OF POPUP
thematicma
* Prompt: Boundary
* Snippet: 2
```

```
*
PROCEDURE _qlk188d1f
IF M.LOCA = 13
SET PROCEDURE TO PROJ13
m.img = 'BOUD'
do distric
SET PROCEDURE TO UTILITY
RETURN
ENDI
```

```
set procedure to process1
M.MET = "TAMBON"
DO BOUD
set procedure to utility
```

```
* _QKA16HJYA ON SELECTION BAR 2 OF
POPUP thematicma
*
* Procedure Origin:
*
* From Menu: SUIT.MPR, Record: 6
* Called By: ON SELECTION BAR 2 OF POPUP
thematicma
* Prompt: Soil
* Snippet: 3
```

```
PROCEDURE _qlk188d1q
IF M.LOCA = 13
SET PROCEDURE TO PROJ13
```

```
m.img = 'SOIL'
do distric
SET PROCEDURE TO UTILITY
RETURN
ENDI
```

```
set procedure to process1
M.MET = "SOIL"
do BOUD
set procedure to utility
```

```
* _QKA16HK01 ON SELECTION BAR 3 OF POPUP
thematicma
*
* Procedure Origin:
*
* From Menu: SUIT.MPR, Record: 7
* Called By: ON SELECTION BAR 3 OF POPUP
thematicma
* Prompt: Slope
* Snippet: 4
```

```
*
PROCEDURE _qlk188d23
IF M.LOCA = 13
SET PROCEDURE TO PROJ13
m.img = 'SLOPE'
do distric
SET PROCEDURE TO UTILITY
RETURN
ENDI
```

```
set procedure to process1
M.MET = "SLOPE"
DO BOUD
set procedure to utility
```

```
* _QKA16HK2P ON SELECTION BAR 4 OF POPUP
thematicma
*
* Procedure Origin:
*
* From Menu: SUIT.MPR, Record: 8
* Called By: ON SELECTION BAR 4 OF POPUP
thematicma
* Prompt: Present land use
* Snippet: 5
```

```
*
PROCEDURE _qlk188d2e
IF M.LOCA = 13
SET PROCEDURE TO PROJ13
m.img = 'LUSE'
do distric
SET PROCEDURE TO UTILITY
RETURN
ENDI
```

```
set procedure to process1
DO luse
set procedure to utility
```

```
* _QKA16HK4X ON SELECTION BAR 5 OF
POPUP thematicma
*
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 9
* Called By: ON SELECTION BAR 5 OF POPUP
thematicma
* Prompt: Hydrology
* Snippet: 6
```

```
*
PROCEDURE _qlk188d2q
IF M.LOCA = 13
SET PROCEDURE TO PROJ13
  m.img = 'RIVER'
  do distric
SET PROCEDURE TO UTILITY
RETURN
ENDI
```

```
set procedure to process1
M.MET = "RIVER"
DO RIVE
set procedure to utility
```

```
* _QKA16HK74 ON SELECTION BAR 6 OF POPUP
thematicma
*
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 10
* Called By: ON SELECTION BAR 6 OF POPUP
thematicma
* Prompt: Road
* Snippet: 7
```

```
*
PROCEDURE _qlk188d31
IF M.LOCA = 13
SET PROCEDURE TO PROJ13
  m.img = 'ROAD'
  do distric
SET PROCEDURE TO UTILITY
RETURN
ENDI
```

```
set procedure to process1
M.MET = "ROAD"
DO ROA
set procedure to utility
```

```
* _QKA16HKJ3 ON SELECTION BAR 2 OF POPUP
landevalua
*
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 67
* Called By: ON SELECTION BAR 2 OF POPUP
landevalua
* Prompt: Relative suit. by WANG
* Snippet: 8
```

```
*
PROCEDURE _qlk188d4d
m.crop = "RELATIVE"
```

```
M.met = "WANG's method"
DO abso.prg
```

```
* _QKA16HLEP ON SELECTION BAR 1 OF
POPUP wetlandric
*
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 17
* Called By: ON SELECTION BAR 1 OF POPUP
wetlandric
* Prompt: Wang's method
* Snippet: 9
```

```
PROCEDURE _qlk188d7y
M.CROP = "WETLAND RICE"
M.met = "WANG's method"
DO abso.prg
```

```
* _QKA16HLGX ON SELECTION BAR 2 OF
POPUP wetlandric
*
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 18
* Called By: ON SELECTION BAR 2 OF POPUP
wetlandric
* Prompt: Modified Multiplication
* Snippet: 10
```

```
PROCEDURE _qlk188d8a
M.CROP = 'WETLAND RICE'
M.met = "DLD's method"
do abso.prg
```

```
* _QLK188D8M ON SELECTION BAR 3 OF POPUP
wetlandric
* Procedure Origin:
* From Menu: SUIT.MPR, Record: 19
* Called By: ON SELECTION BAR 3 OF POPUP
wetlandric
* Prompt: DLD suitability rating
* Snippet: 11
```

```
PROCEDURE _qlk188d8m
M.CROP = "WETLAND RICE"
M.met = "DLD suit"
DO abso.prg
```

```
* _QKA16HLP1 ON SELECTION BAR 1 OF POPUP
uplandrice
*
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 21
* Called By: ON SELECTION BAR 1 OF POPUP
uplandrice
* Prompt: Wang's method
* Snippet: 11
```

```
PROCEDURE _qlk188d9s
M.CROP = "UPLAND RICE"
M.MET = "WANG's method"
DO ABSO.PRG
```

* _QKA16HLRQ ON SELECTION BAR 2 OF POPUP
uplandrice
*
* Procedure Origin:
*
* From Menu: SUIT.MPR, Record: 22
* Called By: ON SELECTION BAR 2 OF POPUP
uplandrice
* Prompt: Modified Multiplication
* Snippet: 12

PROCEDURE _qlk188da4
M.CROP = "UPLAND RICE"
M.MET = "DLD's method"
DO ABSO.PRG

* _QLK188DAG ON SELECTION BAR 3 OF
POPUP wetlandric
* From Menu: SUIT.MPR, Record: 24
* Called By: ON SELECTION BAR 3 OF POPUP
uplandrice
* Prompt: DLD suitability rating
* Snippet: 14

PROCEDURE _qlk188dag
M.CROP = "UPLAND RICE"
M.MET = "DLD suit"
DO ABSO.PRG

* _QKA16HM0G ON SELECTION BAR 1 OF
POPUP maize
*
* Procedure Origin:
*
* From Menu: SUIT.MPR, Record: 25
* Called By: ON SELECTION BAR 1 OF POPUP
maize
* Prompt: Wang's method
* Snippet: 13

PROCEDURE _qka16hm0g
M.CROP = "MAIZE"
M.met = "WANG's method"
DO abso.prg

* QKA16HM2P ON SELECTION BAR 2 OF
POPUP maize
*
* Procedure Origin:
*
* From Menu: SUIT.MPR, Record: 26
* Called By: ON SELECTION BAR 2 OF POPUP
maize
* Prompt: Modified Multiplicatio
* Snippet: 14

PROCEDURE _qka16hm2p
M.CROP = "MAIZE"
M.met = "DLD's method"
DO abso.prg

* _QLK188DCA ON SELECTION BAR 3 OF POPUP
maize
* Procedure Origin: °
*
* From Menu: SUIT.MPR, Record: 29
* Called By: ON SELECTION BAR 3 OF POPUP
maize
* Prompt: DLD suitability rating
* Snippet: 17

PROCEDURE _qlk188dca
M.CROP = "MAIZE"
M.met = "DLD suit"
DO abso.prg

* _QKA16HMBK ON SELECTION BAR 1 OF
POPUP soybean
*
* Procedure Origin:
*
* From Menu: SUIT.MPR, Record: 29
* Called By: ON SELECTION BAR 1 OF POPUP
soybean
* Prompt: Wang's method
* Snippet: 15

PROCEDURE _qka16hmbk
M.CROP = "SOYBEAN"
M.met = "WANG's method"
DO abso.prg

* _QKA16HMDS ON SELECTION BAR 2 OF
POPUP soybean
*
* Procedure Origin:
*
* From Menu: SUIT.MPR, Record: 30
* Called By: ON SELECTION BAR 2 OF POPUP
maize
* Prompt: Modified Multiplication
* Snippet: 16

PROCEDURE _qka16hmds
M.CROP = "SOYBEAN"
M.met = "DLD's method"
DO abso.prg

* _QLK188DE6 ON SELECTION BAR 3 OF POPUP
soybean °
* Procedure Origin:
* From Menu: SUIT.MPR, Record: 34
* Called By: ON SELECTION BAR 3 OF POPUP
soybean
* Prompt: DLD suitability rating
* Snippet: 20

PROCEDURE _qlk188de6
M.CROP = "SOYBEAN"
M.met = "DLD suit"
DO abso.prg


```
* _QKA16HMMT ON SELECTION BAR 1 OF
POPUP peanut
*
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 33
* Called By: ON SELECTION BAR 1 OF POPUP
peanut
* Prompt:  Wang's method
* Snippet: 17
```

```
PROCEDURE _qka16hmmt
M.CROP = "PEANUT"
M.met = "WANG's method"
DO abso.prg
```

```
* _QKA16HMOZ ON SELECTION BAR 2 OF POPUP
peanut
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 34
* Called By: ON SELECTION BAR 2 OF POPUP
peanut
* Prompt:  Modified Multiplication
* Snippet: 18
```

```
PROCEDURE _qka16hmoz
M.CROP = "PEANUT"
M.met = "DLD's method"
DO abso.prg
```

```
* _QLK188DG1 ON SELECTION BAR 3 OF POPUP
peanut
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 39
* Called By: ON SELECTION BAR 3 OF POPUP
peanut
* Prompt:  DLD suitability rating
* Snippet: 23
```

```
PROCEDURE _qlk188dgl
M.CROP = "PEANUT"
M.met = "DLD suit"
DO abso.prg
```

```
* _QKA16HMY5 ON SELECTION BAR 1 OF
POPUP mungbean
*
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 37
* Called By: ON SELECTION BAR 1 OF POPUP
mungbean
* Prompt:  Wang's method
* Snippet: 19
```

```
PROCEDURE _qka16hmy5
M.met = "WANG's method"
DO abso.prg
```

```
* _QKA16HN0C ON SELECTION BAR 2 OF POPUP
mungbean
*
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 38
* Called By: ON SELECTION BAR 2 OF POPUP
mungbean
* Prompt:  Modified Multiplication
* Snippet: 20
```

```
PROCEDURE _qka16hn0c
M.CROP = "MUNGBEAN"
M.met = "DLD's method"
DO abso.prg
```

```
* _QLK188DHY ON SELECTION BAR 3 OF POPUP
mungbean
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 44
* Called By: ON SELECTION BAR 3 OF POPUP
mungbean
* Prompt:  DLD suitability rating
* Snippet: 26
```

```
PROCEDURE _qlk188dhy
M.CROP = "MUNGBEAN"
M.met = "DLD suit"
DO abso.prg
```

```
* _QKA16HN9M ON SELECTION BAR 1 OF
POPUP sugarcane
*
* Procedure Origin:
*
* From Menu: SUIT.MPR,      Record: 41
* Called By: ON SELECTION BAR 1 OF POPUP
sugarcane
* Prompt:  Wang's method
* Snippet: 21
```

```
PROCEDURE _qka16hn9m
M.CROP = "SUGARCANE"
M.met = "WANG's method"
DO abso.prg
```

* _QKA16HNBT ON SELECTION BAR 2 OF
 POPUP sugarcane
 *
 * Procedure Origin:
 *
 * From Menu: SUIT.MPR, Record: 42
 * Called By: ON SELECTION BAR 2 OF POPUP
 sugarcane
 * Prompt: Modified Multiplication
 * Snippet: 22

PROCEDURE _qka16hbt
 M.CROP = "SUGARCANE"
 M.met = "DLD's method"
 DO abso.prg

* _QLK188DJU ON SELECTION BAR 3 OF POPUP
 sugarcane
 * Procedure Origin:
 * From Menu: SUIT.MPR, Record: 49
 * Called By: ON SELECTION BAR 3 OF POPUP
 sugarcane
 * Prompt: DLD suitability rating
 * Snippet: 29

PROCEDURE _qlk188dju
 M.CROP = "SUGARCANE"
 M.met = "DLD suit"
 DO abso.prg

Appendix Table 47. Program listing PROCESS1.PRG containing source codes of the System Shell to produce the map shown on the screen from thematic map menu bar selection.

```
** PROCEDURE TO PROCESS VALUE FILE **
** AND BATCH FILE **
```

```
PROCEDURE BOUD
```

```
set decimals to 0
```

```
sele 4
```

```
use area.dbf
```

```
DO CASE
```

```
  CASE M.MET = "TAMBON"
```

```
    FIEL = "MT"
```

```
    T1 = "Tambon boundary of"
```

```
    T6 = 12
```

```
  CASE M.MET = "SOIL"
```

```
    FIEL = "SOIL_V"
```

```
    T1 = "Soil boundary of"
```

```
    T6 = 14
```

```
  CASE M.MET = "SLOPE"
```

```
    FIEL = "SLOPE_V"
```

```
    T1 = "Slope map of"
```

```
    T6 = 5
```

```
ENDC
```

```
copy to value.val type deli with blank fields
```

```
area_id,&FIEL
```

```
  T5 = 417
```

```
DO CASE
```

```
  CASE M.LOCA = 0
```

```
    PRA = 'PRAO'
```

```
    LOCNAM = 'PRAO'
```

```
    T4 = 188
```

```
    G1 = 507000
```

```
    G2 = 537080
```

```
    G3 = 2099000
```

```
    G4 = 2165720
```

```
  CASE M.LOCA = 1
```

```
    PRA = 'PRAO1'
```

```
    LOCNAM = 'WIANG'
```

```
    T4 = 400
```

```
    G1 = 519300
```

```
    G2 = 523700
```

```
    G3 = 2139600
```

```
    G4 = 2144187
```

```
  CASE M.LOCA = 2
```

```
    PRA = 'PRAO2'
```

```
    LOCNAM = 'KHUAN PHAK'
```

```
    T4 = 330
```

```
    G1 = 514300
```

```
    G2 = 520900
```

```
    G3 = 2130500
```

```
    G4 = 2138840
```

```
  CASE M.LOCA = 3
```

```
    PRA = 'PRAO3'
```

```
    LOCNAM = 'THUNG LUANG'
```

```
    T4 = 420
```

```
    G1 = 519100
```

```
    G2 = 523300
```

```
    G3 = 2137400
```

```
    G4 = 2141570
```

```
  CASE M.LOCA = 4
```

```
    PRA = 'PRAO4'
```

```
    LOCNAM = 'NAM PHRAE'
```

```
    T4 = 403
```

```
  G1 = 506600
```

```
  G2 = 522720
```

```
  G3 = 2127300
```

```
  G4 = 2143980
```

```
    CASE M.LOCA = 5
```

```
  PRA = 'PRAO5'
```

```
  LOCNAM = 'BAN PONG'
```

```
  T4 = 542
```

```
  G1 = 509300
```

```
  G2 = 522308
```

```
  G3 = 2138700
```

```
  G4 = 2148708
```

```
    CASE M.LOCA = 6
```

```
  PRA = 'PRAO6'
```

```
  LOCNAM = 'PA-TUM'
```

```
  T4 = 538
```

```
  G1 = 518100
```

```
  G2 = 538006
```

```
  G3 = 2133800
```

```
  G4 = 2149229
```

```
    CASE M.LOCA = 7
```

```
  PRA = 'PRAO7'
```

```
  LOCNAM = 'PA-NAI'
```

```
  T4 = 456
```

```
  G1 = 519600
```

```
  G2 = 536016
```

```
  G3 = 2141900
```

```
  G4 = 2156912
```

```
    CASE M.LOCA = 8
```

```
  PRA = 'PRAO8'
```

```
  LOCNAM = 'MAE PANG'
```

```
  T4 = 490
```

```
  G1 = 508000
```

```
  G2 = 536910
```

```
  G3 = 2112800
```

```
  G4 = 2137403
```

```
    CASE M.LOCA = 9
```

```
  PRA = 'PRAO9'
```

```
  LOCNAM = 'MAE WAEN'
```

```
  T4 = 525
```

```
  G1 = 517200
```

```
  G2 = 538200
```

```
  G3 = 2124100
```

```
  G4 = 2140780
```

```
    CASE M.LOCA = 10
```

```
  PRA = 'PRAO10'
```

```
  LOCNAM = 'SAN SAI'
```

```
  T4 = 412
```

```
  G1 = 510700
```

```
  G2 = 536656
```

```
  G3 = 2140300
```

```
  G4 = 2166571
```

```
    CASE M.LOCA = 11
```

```
  PRA = 'PRAO11'
```

```
  LOCNAM = 'LOANG KHOT'
```

```
  T4 = 517
```

```
  T5 = 357
```

```
  G1 = 507000
```

```
  G2 = 538020
```

```
  G3 = 2099000
```

```
  G4 = 2120420
```

```
    CASE M.LOCA = 12
```

```
  PRA = 'PRAO12'
```

```

      LOCNAM = 'PROJECT1'
ENDC

SET TEXTMERGE ON TO TEMP.DOC NOSHOW
\file title : <<1>><<locnam>>
\data type : byte
\file type : binary
\columns : <<14>>
\rows : <<15>>
\ref. system : plane
\ref. units : m
\unit dist. : 1.00000
\min. X : <<G1>>
\max. X : <<G2>>
\min. Y : <<G3>>
\max. Y : <<G4>>
\pos'n error : unknown
\resolution : unknown
\min. value : 0
\max. value : <<16>>
\value units : unspecified
\value error : unknown
\flag value : none
\flag def'n : none

DO CASE
  CASE M.MET = "TAMBON"
  \legend cats : 12
  \category 0 :
  \category 1 : WIANG
  \category 2 : KHUAN PHAK
  \category 3 : THUNG LUANG
  \category 4 : NAM PHRAE
  \category 5 : BAN PONG
  \category 6 : PA-TUM
  \category 7 : PA-NAI
  \category 8 : MAE PANG
  \category 9 : MAE WAEN
  \category 10 : SAN SAI
  \category 11 : LOANG KHOT

  CASE M.MET = "SOIL"
  \legend cats : 15
  \category 0 :
  \category 1 : Alluvial Complex
  \category 2 : Tha Muang series
  \category 3 : Alluvial soils
  \category 4 : Hang Dong
  \category 5 : Mae Sai
  \category 6 : Korat
  \category 7 : Hang Chat(Undulating)
  \category 8 : Mae Tang(Undulating)
  \category 9 : Pak Chong(Undulating)
  \category 10 : Li
  \category 11 : Tha Yang/Lat Ya
  \category 12 : Sop Prap
  \category 13 : Mae Rim(Rolling)
  \category 14 : Slope Complex

  CASE M.MET = "SLOPE"
  \legend cats : 6
  \category 0 : %
  \category 1 : 0 - 5
  \category 2 : 5 - 10
  \category 3 : 10 - 15
  \category 4 : 15 - 20
  \category 5 : > 20
ENDC

set textmerge to
SET TEXTMERGE ON TO M.BAT NOSHOW

```

```

\vecho off
\ASSIGN X <<PRA>> OUTFILE VALUE 3

\COPY temp.doc outfile.doc
\COLOR X N OUTFILE IBM Y 0 0
\cls

SET TEXTMERGE TO
!m.bat
return

*****
PROCEDURE ROA

DO CASE
  CASE M.LOCA = 0
  PRA = 'ROAD'
  CASE M.LOCA = 1
  PRA = 'ROAD1'
  CASE M.LOCA = 2
  PRA = 'ROAD2'
  CASE M.LOCA = 3
  PRA = 'ROAD3'
  CASE M.LOCA = 4
  PRA = 'ROAD4'
  CASE M.LOCA = 5
  PRA = 'ROAD5'
  CASE M.LOCA = 6
  PRA = 'ROAD6'
  CASE M.LOCA = 7
  PRA = 'ROAD7'
  CASE M.LOCA = 8
  PRA = 'ROAD8'
  CASE M.LOCA = 9
  PRA = 'ROAD9'
  CASE M.LOCA = 10
  PRA = 'ROAD10'
  CASE M.LOCA = 11
  PRA = 'ROAD11'
  CASE M.LOCA = 12
  PRA = 'ROAD12'
ENDC

SET TEXTMERGE ON TO M.BAT NOSHOW
\vecho off
\COLOR X N <<PRA>> IBM Y 0 0
\cls
SET TEXTMERGE TO
!m.bat

RETURN
*****
PROCEDURE PERSPEC

RETURN
*****
PROCEDURE RIVE

DO CASE
  CASE M.LOCA = 0
  PRA = 'RIVER'
  CASE M.LOCA = 1
  PRA = 'RIVER1'
  CASE M.LOCA = 2
  PRA = 'RIVER2'
  CASE M.LOCA = 3
  PRA = 'RIVER3'
  CASE M.LOCA = 4
  PRA = 'RIVER4'
  CASE M.LOCA = 5

```

```

PRA = 'RIVER5'
  CASE M.LOCA = 6
PRA = 'RIVER6'
  CASE M.LOCA = 7
PRA = 'RIVER7'
  CASE M.LOCA = 8
PRA = 'RIVER8'
  CASE M.LOCA = 9
PRA = 'RIVER9'
  CASE M.LOCA = 10
PRA = 'RIVER10'
  CASE M.LOCA = 11
PRA = 'RIVER11'
  CASE M.LOCA = 12
PRA = 'RIVER12'
ENDC

SET TEXTMERGE ON TO M.BAT NOSHOW
\echo off
\COLOR X N <<PRA>> IBM Y 0 0
\cls
SET TEXTMERGE TO
!m.bat

RETURN
*****
PROCEDURE LUSE

DO CASE
  CASE M.LOCA = 0
  PRA = 'PUSE'
  CASE M.LOCA = 1
  PRA = 'PUSE1'
  CASE M.LOCA = 2
  PRA = 'PUSE2'
  CASE M.LOCA = 3
  PRA = 'PUSE3'
  CASE M.LOCA = 4
  PRA = 'PUSE4'
  CASE M.LOCA = 5
  PRA = 'PUSE5'
  CASE M.LOCA = 6
  PRA = 'PUSE6'
  CASE M.LOCA = 7
  PRA = 'PUSE7'
  CASE M.LOCA = 8
  PRA = 'PUSE8'
  CASE M.LOCA = 9
  PRA = 'PUSE9'
  CASE M.LOCA = 10
  PRA = 'PUSE10'
  CASE M.LOCA = 11
  PRA = 'PUSE11'
  CASE M.LOCA = 12
  PRA = 'PUSE12'
ENDC

SET TEXTMERGE ON TO M.BAT NOSHOW
\echo off
\COLOR X N <<PRA>> IBM Y 0 0
\cls
SET TEXTMERGE TO
!m.bat

return

```

Appendix Table 48. Program listing ABSO.PRG containing source codes of the System Shell to produce the map shown on the screen from land evaluation menu bar selection.

* PROCEDURE ABSO.PRG. *	T3 = 'file type : binary'
*** for project area **	IF meth = "DLD"
IF m.loca= 13	DO CASE
return	CASE M.LOCA = 0
endi	PRA = 'DPRAO'
*****	CASE M.LOCA = 1
set decimals to 0	PRA = 'DPRAO1'
SELE 4	CASE M.LOCA = 2
DO CASE	PRA = 'DPRAO2'
CASE M.met = "WANG's method"	CASE M.LOCA = 3
METH = "Fuzzy method"	PRA = 'DPRAO3'
use	CASE M.LOCA = 4
USE WANG.dbf	PRA = 'DPRAO4'
CASE M.met = "DLD's method"	CASE M.LOCA = 5
meth = "Modified Multiplication"	PRA = 'DPRAO5'
use	CASE M.LOCA = 6
USE ITC.dbf	PRA = 'DPRAO6'
CASE M.MET = "DLD suit"	CASE M.LOCA = 7
meth = "DLD"	PRA = 'DPRAO7'
USE	CASE M.LOCA = 8
USE DLD.DBF	PRA = 'DPRAO8'
ENDC	CASE M.LOCA = 9
IF M.CROP = "RELATIVE"	PRA = 'DPRAO9'
T1 = "Crop Suitability in "	CASE M.LOCA = 10
T6 = 9	PRA = 'DPRAO10'
ELSE	CASE M.LOCA = 11
T1 = "Suitability for "	PRA = 'DPRAO11'
T6 = 4	CASE M.LOCA = 12
ENDI	PRA = 'DPRAO12'
DO CASE	ENDC
CASE m.crop = "RELATIVE"	ELSE
SUIT = 'FC'	DO CASE
CASE m.crop = 'WETLAND RICE'	CASE M.LOCA = 0
SUIT = 'SUIT_C1'	PRA = 'PRAO'
CASE m.crop = 'UPLAND RICE'	CASE M.LOCA = 1
SUIT = 'SUIT_C2'	PRA = 'PRAO1'
CASE m.crop = 'MAIZE'	CASE M.LOCA = 2
SUIT = 'SUIT_C3'	PRA = 'PRAO2'
CASE m.crop = 'SORGHUM'	CASE M.LOCA = 3
SUIT = 'SUIT_C4'	PRA = 'PRAO3'
CASE m.crop = 'CASSAVA'	CASE M.LOCA = 4
SUIT = 'SUIT_C5'	PRA = 'PRAO4'
CASE m.crop = 'SWEET POTATO'	CASE M.LOCA = 5
SUIT = 'SUIT_C6'	PRA = 'PRAO5'
CASE m.crop = 'WHITE POTATO'	CASE M.LOCA = 6
SUIT = 'SUIT_C7'	PRA = 'PRAO6'
CASE m.crop = 'YAMS'	CASE M.LOCA = 7
SUIT = 'SUIT_C8'	PRA = 'PRAO7'
CASE m.crop = 'TARO'	CASE M.LOCA = 8
SUIT = 'SUIT_C9'	PRA = 'PRAO8'
CASE m.crop = 'SOYBEAN'	CASE M.LOCA = 9
SUIT = 'SUIT_C10'	PRA = 'PRAO9'
CASE m.crop = 'PEANUT'	CASE M.LOCA = 10
SUIT = 'SUIT_C11'	PRA = 'PRAO10'
CASE m.crop = 'MUNGBEAN'	CASE M.LOCA = 11
SUIT = 'SUIT_C12'	PRA = 'PRAO11'
CASE m.crop = 'COTTON'	CASE M.LOCA = 12
SUIT = 'SUIT_C13'	PRA = 'PRAO12'
CASE m.crop = 'SUGARCANE'	ENDC
SUIT = 'SUIT_C14'	ENDI
ENDC	T5 = 417
T2 = 'data type : byte'	DO CASE
	CASE M.LOCA = 0
	LOCNAM = 'PRAO'
	T4 = 188

G1 = 507000
G2 = 537080
G3 = 2099000
G4 = 2165720

CASE M.LOCA = 1
LOCNAM = 'WIANG'
T4 = 400

G1 = 519300
G2 = 523700
G3 = 2139600
G4 = 2144187

CASE M.LOCA = 2
LOCNAM = 'KHUAN PHAK'
T4 = 330

G1 = 514300
G2 = 520900
G3 = 2130500
G4 = 2138840

CASE M.LOCA = 3
LOCNAM = 'THUNG LUANG'
T4 = 420

G1 = 519100
G2 = 523300
G3 = 2137400
G4 = 2141570

CASE M.LOCA = 4
LOCNAM = 'NAM PHRAE'
T4 = 403

G1 = 506600
G2 = 522720
G3 = 2127300
G4 = 2143980

CASE M.LOCA = 5
LOCNAM = 'BAN PONG'
T4 = 542

G1 = 509300
G2 = 522308
G3 = 2138700
G4 = 2148708

CASE M.LOCA = 6
LOCNAM = 'PA-TUM'
T4 = 538

G1 = 518100
G2 = 538006
G3 = 2133800
G4 = 2149229

CASE M.LOCA = 7
LOCNAM = 'PA-NAI'
T4 = 456

G1 = 519600
G2 = 536016
G3 = 2141900
G4 = 2156912

CASE M.LOCA = 8
LOCNAM = 'MAE PANG'
T4 = 490

G1 = 508000
G2 = 536910
G3 = 2112800
G4 = 2137403

CASE M.LOCA = 9
LOCNAM = 'MAE WAEN'
T4 = 525

G1 = 517200
G2 = 538200
G3 = 2124100
G4 = 2140780

CASE M.LOCA = 10
LOCNAM = 'SAN SAI'
T4 = 412

G1 = 510700
G2 = 536656

G3 = 2140300
G4 = 2166571
CASE M.LOCA = 11
LOCNAM = 'LOANG KHOT'
T4 = 517
T5 = 357

G1 = 507000
G2 = 538020
G3 = 2099000
G4 = 2120420

CASE M.LOCA = 12
LOCNAM = 'PROJECT'

ENDC

copy to value.val type deli with blank fields area_id,&suit

SET TEXTMERGE ON TO TEMP.DOC NOSHOW

if m.crop = "RELATIVE"

\file title : <<t1>><<locnam>> by <<meth>>

else

\file title : <<t1>><<m.crop>> in <<locnam>> by

<<meth>>

endi

<<t2>>

<<t3>>

\columns : <<t4>>

\rows : <<t5>>

\ref. system : plane

\ref. units : m

\unit dist. : 1.00000

\min. X : <<G1>>

\max. X : <<G2>>

\min. Y : <<G3>>

\max. Y : <<G4>>

\pos'n error : unknown

\resolution : unknown

\min. value : 0

\max. value : <<t6>>

\value units : unspecified

\value error : unknown

\flag value : none

\flag defn : none

if m.crop = "RELATIVE"

\legend cats : 10

\category 0 :

\category 1 : Wetland rice

\category 2 : Upland rice

\category 3 : Maize

\category 4 : Soybean

\category 5 : Peanut

\category 6 : Mungbean

\category 7 : Sugarcane

\category 8 :

\category 9 : Not suit.

else

\legend cats : 5

\category 0 :

\category 1 : Highly Suit.

\category 2 : Moderately

\category 3 : Marginally

\category 4 : Not Suit.

endi

set textmerge to

SET TEXTMERGE ON TO M.BAT NOSHOW

\echo off

\ASSIGN X <<PRA>> OUTFILE VALUE 3

\COPY temp.doc outfile.doc

\COLOR X N OUTFILE IBM Y 0 0

\cls

SET TEXTMERGE TO

!m.bat

Appendix Table 49. Program listing PROJ13.PRG containing source codes of the System Shell to produce the map from project area selection.

**** PROCEDURE PROJ13.PRG ****

```

PROCEDURE distric
DO CASE
CASE M.IMG = 'BOUD'
PRA = 'BOUD13'
CASE M.IMG = 'SOIL'
PRA = 'SOIL13'
CASE M.IMG = 'SLOPE'
PRA = 'SLOPE13'
CASE M.IMG = 'LUSE'
PRA = 'L_USE13'
PRA1 = 'L_USE13m'
CASE M.IMG = 'ROAD'
PRA = 'ROAD13'
CASE M.IMG = 'RIVER'
PRA = 'RIVER13'
ENDC

IF m.img = 'LUSE'
SET TEXTMERGE ON TO M.BAT NOSHOW
\echo off
\COLOR X N <<PRA>> use Y 0 0
\color x n <<PRA1>> use Y 0 0
\cls
SET TEXTMERGE TO
!m.bat

ELSE
SET TEXTMERGE ON TO M.BAT NOSHOW
\echo off
\COLOR X N <<PRA>> ibm Y 0 0
\cls
SET TEXTMERGE TO
!m.bat

ENDI
return
*****
procedure perspec
PRA1 = 'L_USE13M'
C_PRA13 = 'CONT13'
SET TEXTMERGE ON TO M.BAT NOSHOW
\echo off
\ortho x <<C_PRA13>> 0 45 30 .3 # # <<PRA1>>;
use y
\cls
SET TEXTMERGE TO
!m.bat
RETURN

```


Appendix Table 50. The error matrix (no. of pixels) from Fuzzy method comparing LUR defined by DLD (column) and FAO (row)

Wetland-rice	S1	S2	S3	N	Khat
S1	0	3313	0	0	
S2	1467	6284	0	0	
S3	179	193	0	0	
N	69	65	0	0	-0.18

Upland-rice	S1	S2	S3	N	Khat
S1	0	3313	0	0	
S2	853	682	0	0	
S3	6692	30	0	0	
N	0	0	0	0	-0.22

Maize	S1	S2	S3	N	Khat
S1	1060	2145	0	0	
S2	511	7499	0	0	
S3	237	79	0	0	
N	39	0	0	0	0.30

Soybean	S1	S2	S3	N	Khat
S1	0	89	0	0	
S2	1527	9637	0	0	
S3	218	88	0	0	
N	11	0	0	0	0.07

Groundnut	S1	S2	S3	N	Khat
S1	875	2045	0	0	
S2	2834	5601	0	0	
S3	206	0	0	0	
N	0	9	0	0	-0.02

Mungbean	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	8699	2665	0	0	
S3	206	0	0	0	
N	0	0	0	0	0.01

Sugarcane	S1	S2	S3	N	Khat
S1	0	3298	0	0	
S2	0	7862	0	0	
S3	0	410	0	0	
N	0	0	0	0	0.00

Appendix Table 51. The error matrix (no. of pixels) from the Law of Minimum comparing LUR defined by DLD (column) and FAO (row)

Wetland-rice	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	0	0	
S3	0	0	7961	0	
N	0	0	3101	508	0.18

Upland-rice	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	2075	2145	
S3	0	0	6316	549	
N	0	0	327	158	0.19

Maize	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	1233	2145	
S3	0	0	7155	520	
N	0	0	330	187	0.25

Soybean	S1	S2	S3	N	Khat
S1	0	0	73	0	
S2	0	0	855	0	
S3	0	1443	6020	2665	
N	0	98	229	187	-0.06

Groundnut	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	5716	1324	0	
S3	0	1190	161	2205	
N	0	327	0	647	0.22

Mungbean	S1	S2	S3	N	Khat
S1	74	393	0	0	
S2	0	5562	1100	0	
S3	0	1330	161	2695	
N	0	98	0	157	0.17

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	0	0	
S3	0	0	10998	0	
N	0	0	415	157	0.41

Appendix Table 52. The error matrix (no. of pixels) from the Multiplication method comparing LUR defined by DLD (column) and FAO (row)

Wetland-rice	S1	S2	S3	N	Khat
S1	0	0	0	2756	
S2	0	0	0	204	
S3	0	0	0	0	
N	0	286	0	8324	-0.02

Upland-rice	S1	S2	S3	N	Khat
S1	0	0	0	4194	
S2	256	0	0	6131	
S3	0	0	0	0	
N	0	98	0	891	-0.02

Maize	S1	S2	S3	N	Khat
S1	241	0	0	4516	
S2	15	0	0	5283	
S3	0	0	0	0	
N	0	98	0	1417	0.00

Soybean	S1	S2	S3	N	Khat
S1	241	2407	0	2951	
S2	15	1244	0	4155	
S3	0	0	0	0	
N	98	302	0	157	-0.07

Groundnut	S1	S2	S3	N	Khat
S1	2421	3927	0	3012	
S2	0	1176	0	0	
S3	0	0	0	0	
N	327	131	0	576	0.12

Mungbean	S1	S2	S3	N	Khat
S1	2715	4819	0	3429	
S2	196	23	0	96	
S3	0	0	0	0	
N	98	131	0	63	-0.03

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	256	0	0	4538	
S3	0	0	0	0	
N	0	98	0	6678	0.01

Appendix Table 53. The error matrix (no. of pixels) from the Modified Multiplication method comparing LUR defined by DLD (column) and FAO (row)

Wetland-rice	S1	S2	S3	N	Khat
S1	0	7961	0	0	
S2	0	0	0	0	
S3	0	0	0	0	
N	0	3602	0	7	0.00

Upland-rice	S1	S2	S3	N	Khat
S1	0	2075	0	2145	
S2	0	6345	0	520	
S3	0	0	0	0	
N	0	448	0	37	0.16

Maize	S1	S2	S3	N	Khat
S1	0	1233	0	2145	
S2	0	7155	0	520	
S3	0	0	0	0	
N	0	480	0	37	0.21

Soybean	S1	S2	S3	N	Khat
S1	0	928	0	0	
S2	1481	5982	0	2665	
S3	0	0	0	0	
N	98	379	0	0	-0.13

Groundnut	S1	S2	S3	N	Khat
S1	5929	1111	0	0	
S2	1293	58	0	2205	
S3	0	0	0	0	
N	327	150	0	497	0.19

Mungbean	S1	S2	S3	N	Khat
S1	6262	867	0	0	
S2	1433	58	0	2695	
S3	0	0	0	0	
N	98	150	0	7	0.17

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	10998	0	0	
S3	0	0	0	0	
N	0	565	0	7	0.02

Appendix Table 54. The error matrix (no. of pixels) from comparison of the Modified Multiplication method (column) and the Law of Minimum (row) using LUR defined by FAO.

Wetland-rice	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	0	0	
S3	0	7961	0	0	
N	0	0	0	3609	0.24

Upland-rice	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	4220	0	0	0	
S3	0	6865	0	0	
N	0	0	0	485	-0.23

Maize	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	3378	0	0	0	
S3	0	0	7675	0	
N	0	0	0	517	-0.19

Soybean	S1	S2	S3	N	Khat
S1	73	0	0	0	
S2	855	0	0	0	
S3	0	10128	0	0	
N	0	0	0	514	-0.02

Groundnut	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	7040	0	0	0	
S3	0	3556	0	0	
N	0	0	0	974	-0.14

Mungbean	S1	S2	S3	N	Khat
S1	467	0	0	0	
S2	6662	0	0	0	
S3	0	4186	0	0	
N	0	0	0	255	-0.22

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	0	0	
S3	10998	0	0	0	
N	0	0	0	572	0.05

Appendix Table 55. The error matrix (no. of pixels) from comparison of the Modified Multiplication method(column) and the Multiplication method (row) using LUR defined by FAO

Wetland-rice	S1	S2	S3	N	Khat
S1	0	2756	0	0	
S2	0	204	0	0	
S3	0	0	0	0	
N	0	5001	0	3609	0.11

Upland-rice	S1	S2	S3	N	Khat
S1	4194	0	0	0	
S2	26	6361	0	0	
S3	0	0	0	0	
N	0	504	0	485	0.91

Maize	S1	S2	S3	N	Khat
S1	3378	1379	0	0	
S2	0	5298	0	0	
S3	0	0	0	0	
N	0	998	0	517	0.64

Soybean	S1	S2	S3	N	Khat
S1	928	4671	0	0	
S2	0	5414	0	0	
S3	0	0	0	0	
N	0	43	0	514	0.26

Groundnut	S1	S2	S3	N	Khat
S1	7040	2320	0	0	
S2	0	1176	0	0	
S3	0	0	0	0	
N	0	60	0	974	0.56

Mungbean	S1	S2	S3	N	Khat
S1	7129	3834	0	0	
S2	0	315	0	0	
S3	0	0	0	0	
N	0	37	0	255	0.18

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	4794	0	0	
S3	0	0	0	0	
N	0	6204	0	572	0.07

Appendix Table 56. The error matrix (no. of pixels) from comparison of the Modified Multiplication method (column) and the Fuzzy land evaluation (row) using LUR defined by FAO.

Wetland-rice	S1	S2	S3	N	Khat
S1	0	2873	0	440	
S2	0	5038	0	2713	
S3	0	50	0	322	
N	0	0	0	134	-0.03

Upland-rice	S1	S2	S3	N	Khat
S1	3292	6	0	15	
S2	924	588	0	23	
S3	4	6271	0	447	
N	0	0	0	0	0.19

Maize	S1	S2	S3	N	Khat
S1	2145	1060	0	0	
S2	1233	6520	0	257	
S3	0	95	0	221	
N	0	0	0	39	0.46

Soybean	S1	S2	S3	N	Khat
S1	89	0	0	0	
S2	839	10070	0	255	
S3	0	58	0	248	
N	0	0	0	11	0.22

Groundnut	S1	S2	S3	N	Khat
S1	786	2134	0	0	
S2	6254	1422	0	759	
S3	0	0	0	206	
N	0	0	0	9	-0.30

Mungbean	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	7129	3980	0	255	
S3	0	206	0	0	
N	0	0	0	0	-0.02

Sugarcane	S1	S2	S3	N	Khat
S1	0	3298	0	0	
S2	0	7657	0	205	
S3	0	43	0	367	
N	0	0	0	0	0.04

Appendix Table 57. The error matrix (no. of pixels) from comparison of the Law of Minimum (column) and the Multiplication method (row) using LUR defined by FAO.

Wetland-rice	S1	S2	S3	N	Khat
S1	0	0	2756	0	
S2	0	0	204	0	
S3	0	0	0	0	
N	0	0	5001	3609	0.10

Upland-rice	S1	S2	S3	N	Khat
S1	0	4194	0	0	
S2	0	26	6361	0	
S3	0	0	0	0	
N	0	0	504	485	-0.20

Maize	S1	S2	S3	N	Khat
S1	0	3378	1379	0	
S2	0	0	5298	0	
S3	0	0	0	0	
N	0	0	998	517	-0.11

Soybean	S1	S2	S3	N	Khat
S1	73	855	4671	0	
S2	0	0	5414	0	
S3	0	0	0	0	
N	0	0	43	514	0.01

Groundnut	S1	S2	S3	N	Khat
S1	0	7040	2320	0	
S2	0	0	1176	0	
S3	0	0	0	0	
N	0	0	60	974	0.02

Mungbean	S1	S2	S3	N	Khat
S1	467	6662	3834	0	
S2	0	0	315	0	
S3	0	0	0	0	
N	0	0	37	255	0.01

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	4794	0	
S3	0	0	0	0	
N	0	0	6204	572	0.02

Appendix Table 58. The error matrix (no. of pixels) from comparison of the Law of Minimum (column) and Fuzzy land evaluation (row) using LUR defined by FAO.

Wetland-rice	S1	S2	S3	N	Khat
S1	0	0	2873	440	
S2	0	0	5038	2713	
S3	0	0	50	322	
N	0	0	0	134	-0.01

Upland-rice	S1	S2	S3	N	Khat
S1	0	3292	6	15	
S2	0	924	588	23	
S3	0	4	6271	447	
N	0	0	0	0	0.38

Maize	S1	S2	S3	N	Khat
S1	0	2145	1060	0	
S2	0	1233	6520	257	
S3	0	0	95	221	
N	0	0	0	39	-0.13

Soybean	S1	S2	S3	N	Khat
S1	73	16	0	0	
S2	0	839	10070	255	
S3	0	0	58	248	
N	0	0	0	11	-0.01

Groundnut	S1	S2	S3	N	Khat
S1	0	786	2134	0	
S2	0	6254	1422	759	
S3	0	0	0	206	
N	0	0	0	9	0.17

Mungbean	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	467	6662	3980	255	
S3	0	0	206	0	
N	0	0	0	0	0.05

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	3298	0	
S2	0	0	7657	205	
S3	0	0	43	367	
N	0	0	0	0	-0.03

Appendix Table 59. The error matrix (no. of pixels) from comparison of the Multiplication method (column) and Fuzzy land evaluation (row) using LUR defined by FAO.

Wetland-rice	S1	S2	S3	N	Khat
S1	2756	117	0	440	
S2	0	87	0	7664	
S3	0	0	0	372	
N	0	0	0	134	0.19

Upland-rice	S1	S2	S3	N	Khat
S1	3292	6	0	15	
S2	902	573	0	60	
S3	0	5808	0	914	
N	0	0	0	0	0.19

Maize	S1	S2	S3	N	Khat
S1	3205	0	0	0	
S2	1552	5298	0	1160	
S3	0	0	0	316	
N	0	0	0	39	0.54

Soybean	S1	S2	S3	N	Khat
S1	89	0	0	0	
S2	5510	5356	0	298	
S3	0	58	0	248	
N	0	0	0	11	0.03

Groundnut	S1	S2	S3	N	Khat
S1	2920	0	0	0	
S2	6440	1176	0	819	
S3	0	0	0	206	
N	0	0	0	9	0.11

Mungbean	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	10963	109	0	292	
S3	0	206	0	0	
N	0	0	0	0	-0.02

Sugarcane	S1	S2	S3	N	Khat
S1	0	3298	0	0	
S2	0	1496	0	6366	
S3	0	0	0	410	
N	0	0	0	0	-0.21

Appendix Table 60. The error matrix (no. of pixels) from comparison of the Modified Multiplication method (column) and the Law of Minimum (row) using LUR defined by DLD.

Wetland-rice	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	0	0	
S3	0	7961	0	0	
N	0	0	0	3609	0.24

Upland-rice	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	0	0	
S3	0	8718	0	0	
N	0	150	0	2702	0.19

Maize	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	0	0	
S3	0	8718	0	0	
N	0	150	0	2702	0.19

Soybean	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	1541	0	0	0	
S3	38	7139	0	0	
N	0	150	0	2702	0.11

Groundnut	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	7233	0	0	0	
S3	316	1169	0	0	
N	0	150	0	2702	0.12

Mungbean	S1	S2	S3	N	Khat
S1	74	0	0	0	
S2	7383	0	0	0	
S3	336	925	0	0	
N	0	150	0	2702	0.14

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	0	0	
S3	0	11413	0	0	
N	0	150	0	7	0.00

Appendix Table 61. The error matrix (no. of pixels) from comparison of the Modified Multiplication method (column) and the Multiplication method (row) using LUR defined by DLD.

Wetland-rice	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	286	0	0	
S3	0	0	0	0	
N	0	11277	0	7	0.00

Upland-rice	S1	S2	S3	N	Khat
S1	0	256	0	0	
S2	0	98	0	0	
S3	0	0	0	0	
N	0	8514	0	2702	0.01

Maize	S1	S2	S3	N	Khat
S1	0	256	0	0	
S2	0	98	0	0	
S3	0	0	0	0	
N	0	8514	0	2702	0.01

Soybean	S1	S2	S3	N	Khat
S1	928	4671	0	0	
S2	0	5414	0	0	
S3	0	0	0	0	
N	0	43	0	514	0.26

Groundnut	S1	S2	S3	N	Khat
S1	2748	0	0	0	
S2	4801	433	0	0	
S3	0	0	0	0	
N	0	886	0	2702	0.32

Mungbean	S1	S2	S3	N	Khat
S1	3009	0	0	0	
S2	4784	189	0	0	
S3	0	0	0	0	
N	0	886	0	2702	0.31

Sugarcane	S1	S2	S3	N	Khat
S1	0	256	0	0	
S2	0	98	0	0	
S3	0	0	0	0	
N	0	11209	0	7	0.00

Appendix Table 62. The error matrix (no. of pixels) from comparison of the Modified Multiplication method (column) and the Fuzzy land evaluation (row) using LUR defined by DLD.

Wetland-rice	S1	S2	S3	N	Khat
S1	0	1715	0	0	
S2	0	9848	0	7	
S3	0	0	0	0	
N	0	0	0	0	0.00

Upland-rice	S1	S2	S3	N	Khat
S1	0	7538	0	7	
S2	0	1330	0	2695	
S3	0	0	0	0	
N	0	0	0	0	-0.21

Maize	S1	S2	S3	N	Khat
S1	0	1847	0	0	
S2	0	7021	0	2702	
S3	0	0	0	0	
N	0	0	0	0	-0.10

Soybean	S1	S2	S3	N	Khat
S1	354	1402	0	0	
S2	1225	5887	0	2702	
S3	0	0	0	0	
N	0	0	0	0	-0.04

Groundnut	S1	S2	S3	N	Khat
S1	3003	882	0	30	
S2	4546	437	0	2672	
S3	0	0	0	0	
N	0	0	0	0	0.00

Mungbean	S1	S2	S3	N	Khat
S1	7793	1075	0	37	
S2	0	0	0	2665	
S3	0	0	0	0	
N	0	0	0	0	0.29

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	11563	0	0	
S3	0	0	0	0	
N	0	0	0	7	1.00

Appendix Table 63. The error matrix (no. of pixels) from comparison of the Law of Minimum (column) and the Multiplication method (row) using LUR defined by DLD.

Wetland-rice	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	271	15	
S3	0	0	0	0	
N	0	0	10791	493	0.00

Upland-rice	S1	S2	S3	N	Khat
S1	0	0	256	0	
S2	0	0	98	0	
S3	0	0	0	0	
N	0	0	8364	2852	0.01

Maize	S1	S2	S3	N	Khat
S1	0	0	256	0	
S2	0	0	98	0	
S3	0	0	0	0	
N	0	0	8364	2852	0.01

Soybean	S1	S2	S3	N	Khat
S1	0	339	15	0	
S2	0	1202	2678	73	
S3	0	0	0	0	
N	0	0	4484	2779	0.18

Groundnut	S1	S2	S3	N	Khat
S1	0	2687	61	0	
S2	0	4546	557	131	
S3	0	0	0	0	
N	0	0	867	2721	0.42

Mungbean	S1	S2	S3	N	Khat
S1	74	2825	110	0	
S2	0	4558	284	131	
S3	0	0	0	0	
N	0	0	867	2721	0.44

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	256	0	
S2	0	0	98	0	
S3	0	0	0	0	
N	0	0	11059	157	0.00

Appendix Table 64. The error matrix (no. of pixels) from comparison of the Law of Minimum (column) and Fuzzy land evaluation (row) using LUR defined by DLD.

Wetland-rice	S1	S2	S3	N	Khat
S1	0	0	1678	37	
S2	0	0	9384	47	
S3	0	0	0	0	
N	0	0	0	0	0.00

Upland-rice	S1	S2	S3	N	Khat
S1	0	0	7415	130	
S2	0	0	1303	2722	
S3	0	0	0	0	
N	0	0	0	0	0.00

Maize	S1	S2	S3	N	Khat
S1	0	0	1825	22	
S2	0	0	6893	2830	
S3	0	0	0	0	
N	0	0	0	0	0.00

Soybean	S1	S2	S3	N	Khat
S1	0	339	1395	22	
S2	0	1202	5782	2830	
S3	0	0	0	0	
N	0	0	0	0	-0.01

Groundnut	S1	S2	S3	N	Khat
S1	0	2899	964	52	
S2	0	4334	521	2800	
S3	0	0	0	0	
N	0	0	0	0	-0.07

Mungbean	S1	S2	S3	N	Khat
S1	74	7383	1261	187	
S2	0	0	0	2665	
S3	0	0	0	0	
N	0	0	0	0	-0.17

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	0	0	11413	157	
S3	0	0	0	0	
N	0	0	0	0	0.00

Appendix Table 65. The error matrix (no. of pixels) from comparison of the Multiplication method (column) and the Fuzzy land evaluation (row) using LUR defined by DLD.

Wetland rice	S1	S2	S3	N	Khat
S1	0	286	0	1429	
S2	0	0	0	9855	
S3	0	0	0	0	
N	0	0	0	0	-0.02

Upland-rice	S1	S2	S3	N	Khat
S1	256	98	0	7191	
S2	0	0	0	4025	
S3	0	0	0	0	
N	0	0	0	0	0.00

Maize	S1	S2	S3	N	Khat
S1	256	98	0	1493	
S2	0	0	0	9723	
S3	0	0	0	0	
N	0	0	0	0	0.01

Soybean	S1	S2	S3	N	Khat
S1	354	1402	0	0	
S2	0	2551	0	7263	
S3	0	0	0	0	
N	0	0	0	0	-0.06

Groundnut	S1	S2	S3	N	Khat
S1	1767	1316	0	832	
S2	981	3918	0	2756	
S3	0	0	0	0	
N	0	0	0	0	0.18

Mungbean	S1	S2	S3	N	Khat
S1	3009	4973	0	923	
S2	0	0	0	2665	
S3	0	0	0	0	
N	0	0	0	0	-0.06

Sugarcane	S1	S2	S3	N	Khat
S1	0	0	0	0	
S2	256	98	0	11216	
S3	0	0	0	0	
N	0	0	0	0	0.00