LAND SUITABILITY MAP

ROBUSTA, LIBERICA AND EXCELSA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

PROVINCE OF SARANGANI

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF AGRICULTURE
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MAP INDEX

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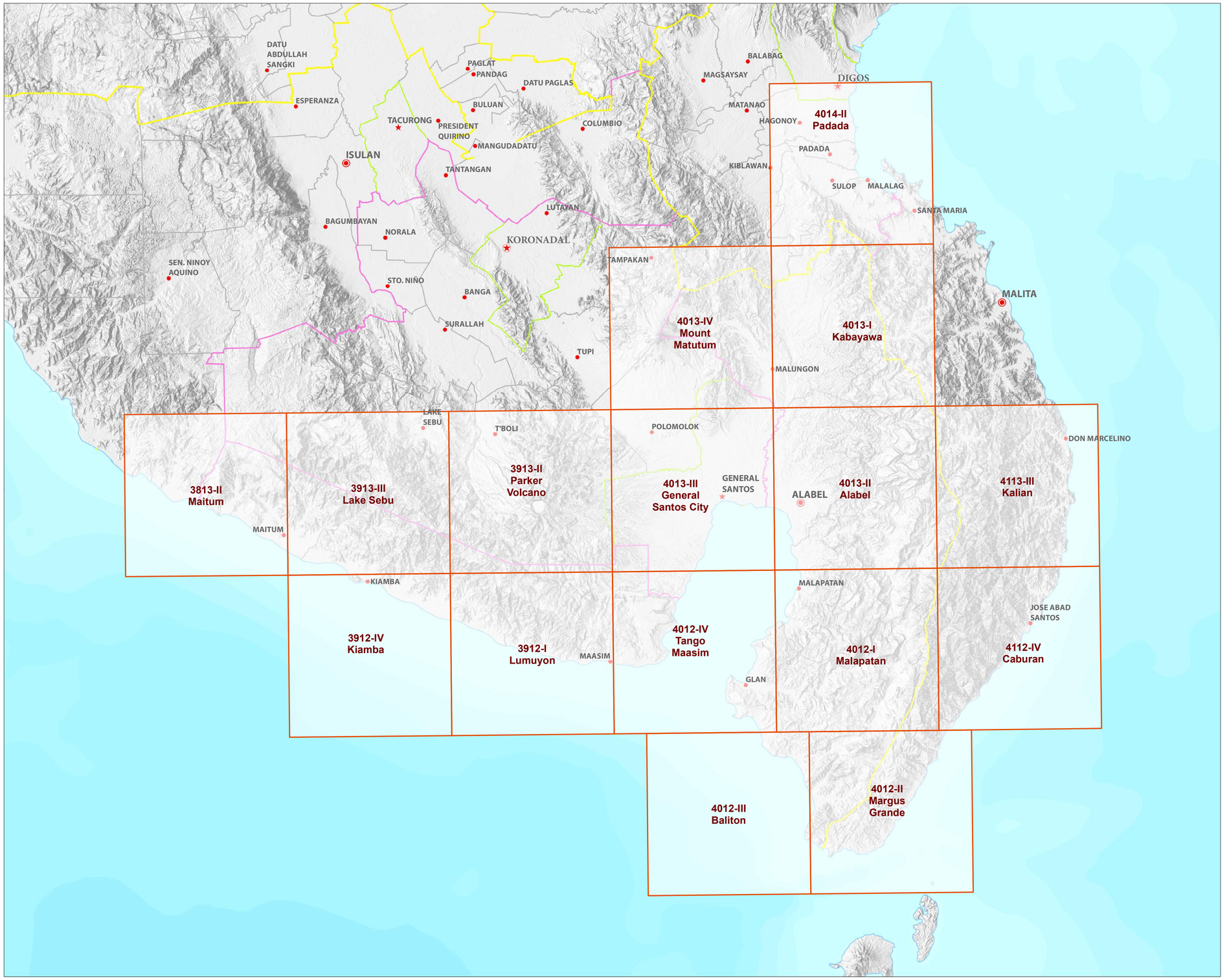
PROVINCE OF SARANGANI



LEGEND

Places

- Capital City
- City
- Capital Town
- Town

Administrative Boundary

- Regional
- Provincial
- City
- Municipal

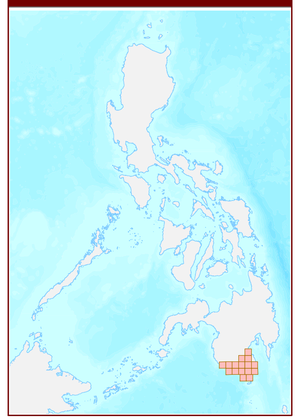
Map Index

- Index grid

Topographic Relief

Bathymetry

LOCATION MAP



MISCELLANEOUS INFORMATION

Land suitabilityinformation produced by the Bureau of Soils and Water Management (BSWM) through the **Land Resources Evaluation and Suitability Assessment of Strategic Production Areas for Major Commodities Project** duly supported by the Philippine Council on Agriculture and Fisheries (PCAF) and funded by the Bureau of Agricultural Research (BAR).

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LAND SUITABILITY MAP FOR ROBUSTA, LIBERICA AND EXCELSA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

SARANGANI, REGION XII

EXTENT OF SUITABILITY FOR ROBUSTA, LIBERICA AND EXCELSA COFFEE PRODUCTION BY MUNICIPALITY

MUNICIPALITY	EXISTING COFFEE (Ha)			TOTAL EXISTING AREA (Ha)	EXPANSION AREA (Ha)						CONFLICT RESOLUTION AREA (Ha)						TOTAL POTENTIAL EXPANSION AREA (Ha)
					Coconut		Shrubland, unmanaged*		Grassland, unmanaged*		Corn		Paddy rice, non-irrigated		Other crops		
	S1	S2	S3		S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	
ALABEL	2	-	-	2	5,745	564	635	13	3,584	1,290	868	3	-	-	3	-	12,705
GLAN	1	2	2	5	7,445	2,498	90	33	2,421	1,094	211	32	-	-	-	-	13,824
KIAMBA	-	-	-	-	5,250	55	407	131	147	38	1,410	-	-	-	-	-	7,437
MAASIM	1	-	-	1	4,417	956	356	50	1,790	1,645	81	-	-	-	-	-	9,296
MAITUM	1	-	9	9	2,944	670	117	47	90	53	1,441	71	-	-	-	-	5,431
MALAPATAN	-	1	1	2	5,113	889	63	21	1,076	566	27	5	-	-	-	-	7,761
MALUNGON	27	-	6	33	9,327	11	1,798	40	1,793	271	7,187	563	-	-	7	-	20,996
TOTAL	32	3	17	**52**	40,241	5,643	3,465	336	10,900	4,956	11,225	674	-	-	10	-	**77,451**

Note: Delivery of robusta coffee planting materials must be started on the onset of rainy season.
**establishment of shade trees prior to planting of robusta coffee.*

SUITABILITY CLASSES:

Highly Suitable (S1)
Land having no significant limitation to sustained application of a given use, or only minor limitations that will not significantly reduce productivity or benefits and will not raise inputs above an acceptable level.

Marginally Suitable (S3)
Land having limitations which in aggregate are severe for sustained application of a given use and will so reduce productivity or benefits, or increase required inputs, that this expenditure will be only marginally justified.

Moderately Suitable (S2)
Land having limitation which in aggregate are moderately severe for sustained application of a given use; the limitation will reduce productivity or benefits and increase required inputs to the extent that the overall advantage to be gained from the use, although still attractive, will be appreciably inferior to that expected on class S1 land.

Not Suitable / Not Relevant
Land having limitations which may be surmountable in time but which cannot be corrected with existing knowledge at currently acceptable cost; the limitations are so severe as to preclude successful sustained use of the land in the given manner. Existing forest, shrubland greater than 18% slope, irrigated paddy rice and miscellaneous land types such as built up areas, roads, etc are considered as not relevant.

AGRONOMIC REQUIREMENT OF ROBUSTA, LIBERICA AND EXCELSA COFFEE PRODUCTION

LAND UTILIZATION TYPE	SUITABILITY RATING	SLOPE (%)	SOIL DEPTH (cm)	SOIL TEXTURE	SOIL DRAINAGE	SOIL REACTION (pH)	INHERENT FERTILITY	FLOODING CLASS	EROSION CLASS	ROCK OUTCROPS	ELEVATION (masl)	ANNUAL RAINFALL (mm)	CLIMATIC TYPE
Coffee (Robusta, Excelsa, Liberica)	S1	<8	>100	CL, SiCL, SCL, SC, SiC, C, HC	WD,MWD	5.6 -7.2	high	none-slight	none-slight	none-few	<1000	2001-4500	I, III, IV
	S2	8 - 30	30 - 100	FSL, L, SiL	SPD,PD	5.1 - 5.5 7.3 - 7.8	medium	moderate	moderate	common	1000-2000	1000-2000	I, II
	S3	>30	<30	S, LS, CSL, SL	VPD,ED	<5.0 -> 7.9	low	severe	severe	many	>2000	<1000 >4500	

SLOPE (%)
0 - 3 - level to gently sloping
3 - 8 - gently sloping to undulating
8 - 18 - undulating to rolling
18 - 30 - rolling to moderately steep
30 - 50 - steep
> 50 - very steep

SOIL DRAINAGE
ED - excessively drained
WD - well drained
MWD - moderately well drained
SPD - somewhat poorly drained
PD - poorly drained
VPD - very poorly drained

SOIL REACTION (pH)
< 4.5 - extremely acid
4.5 - 5.0 - very strongly acid
5.1 - 5.5 - strongly acid
5.6 - 6.0 - medium acid
6.1 - 6.5 - slightly acid
6.6 - 7.2 - neutral
7.3 - 7.8 - mildly alkaline
7.9 - 8.4 - moderately alkaline
> 8.5 - strongly alkaline

SOIL TEXTURE
Coarse
S - sand
LS - loamy sand
CSL - coarse sandy loam
SL - sandy loam
Medium
FSL - fine sandy loam
L - loam
SiL - silt loam
CL - clay loam
SiCL - silty clay loam
SCL - sandy clay loam
Fine
SC - sandy clay
SiC - silty clay
C - clay
HC - heavy clay

SOIL DEPTH (cm)
0 - 30 - very shallow
30 - 50 - shallow
50 - 100 - moderately deep
> 100 - deep to very deep

SURFACE IMPEDIMENT
ROCK OUTCROPS
< 10% - none - few
10 - 30% - common
> 30% - many

LAND LIMITATIONS DESCRIPTION AND COMBINATIONS

ELEVATION
El2 - 1000m - 2000m
El3 - > 2000m

SOIL DRAINAGE
D2 - Somewhat poorly drained to poorly drained
D3 - Very poorly drained or excessively drained

SOIL DEPTH
Sh2 - Shallow to moderately deep (30 - 100cm)
Sh3 - Very shallow (< 30cm)

SOIL EROSION
E2 - Moderate erosion
E3 - Severe erosion

SLOPE/TOPOGRAPHY
T2 - Undulating to moderately steep
T3 - Steep to very steep

SOIL TEXTURE
Tc - Coarse texture

ROCK OUTCROPS
Rc2 - Common
Rc3 - Many

FLOODING
F2 - Moderate seasonal flooding
F3 - Severe seasonal flooding

CODE	LIMITATION	CODE	LIMITATION	CODE	LIMITATION	CODE	LIMITATION
1	E2-Sh2-Rc2	*11*	T2	*21*	T3	*31*	T3-F2-D2
2	E2-Sh2-Rc3	*12*	T2-E3	*22*	T3-E3	*32*	T3
3	E3-Rc3	*13*	T2-E3-Rc2	*23*	T3-E3-Rc2	*33*	T3-E3
4	E3-Sh2-Rc3	*14*	T2-E3-Rc3	*24*	T3-E3-Sh2-Rc3	*34*	T3-E3-Rc3
5	El2-E3-Rc3	*15*	T2-E3-Sh2-Rc2	*25*	T3-E3-Sh3-Rc2	*35*	T3-E3-Sh3-Rc3
6	El2-Sh2-Rc2	*16*	T2-E3-Sh2-Rc3	*26*	T3-E3-Sh3-Rc3	*36*	T3-El2-E3
7	F2-D2	*17*	T2-El2-E3-Rc3	*27*	T3-El2-E3	*37*	T3-El2-E3-Sh3-Rc3
8	F3-D2	*18*	T2-El2-E3-Sh2-Rc2	*28*	T3-El2-E3-Sh2-Rc3	*38*	T3-El3-E3-Sh3-Rc3
9	Rc2	*19*	T2-F2-D2	*29*	T3-El2-E3-Sh3-Rc2	*39*	T3-El3
10	Sh2-Rc2	*20*	T2-F3-D2	*30*	T3-El3-E3-Sh3-Rc2	*40*	Tc

CODE	LANDUSE
4	Corn
81	Coffee
82	Cacao
85	Mango
91	Banana
105	Fruit trees, mixed
116	Coconut
126	Grassland
134	Shrubs, unmanaged

CLIMATE TYPE

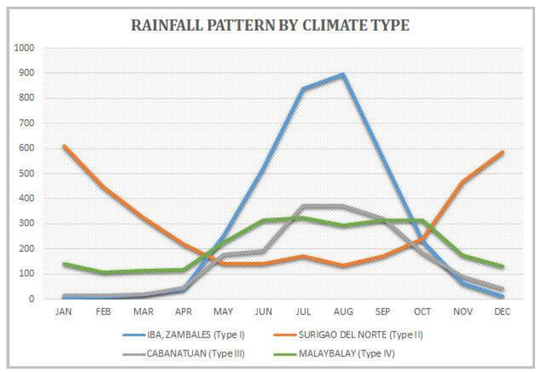
TYPE I : Two pronouced season, dry from November to April and wet during the rest of the year. Maximum rain period is from June to September

TYPE II : No dry season with a very pronounced maximum rain period from December to February. There is not a single dry month. Maximum monthly rainfall occurs during the period from March to May.

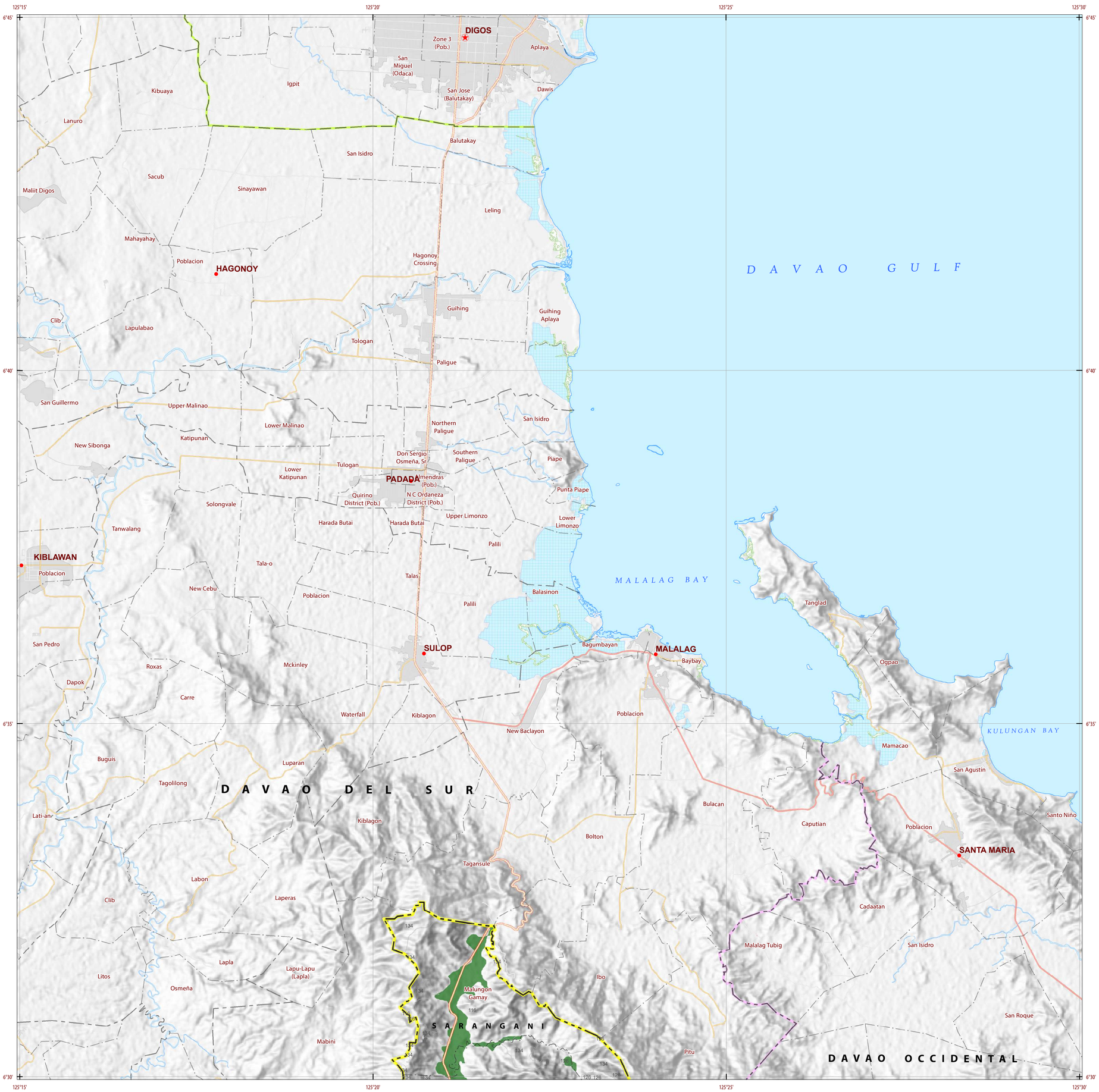
TYPE III : No very pronounced maximum rain period, with a dry season lasting only from one to three months, either during the period from December to February or from March to May. This type resembles Type I since it has a short dry season.

TYPE IV : Rainfall is more or less evenly distributed throughout the year. This type resembles Type II since it has no dry season.

Sarangani is classified as climatic Type IV.



Source: PAGASA 2018, *Climatological Normals (Rainfall)*, Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), accessed 27 July 2018, <https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>.



LAND SUITABILITY MAP ROBUSTA, LIBERICA AND EXCELSA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

N
W E
S

SCALE 1 : 50 000

0 0.5 1 2 3 4 5
Kilometers
0 0.5 1 2 3
Miles

Universal Transverse Mercator Zone 51 N. PRS 1992 Datum
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LEGEND

SUITABILITY CLASSES

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- S2 — **Moderately Suitable** - Land having limitations which in aggregate are moderately severe for sustained application of a given use; the limitations will reduce productivity or benefits and increase required inputs to the extent that the overall advantage to be gained from the use, although still attractive, will be appreciably inferior to that expected on class S1 land.
- S3 — **Marginally Suitable** - Land having limitations which in aggregate are severe for sustained application of a given use and will so reduce productivity or benefits, or increase required inputs, that this expenditure will be only marginally justified.
- **Not Suitable/ Not Relevant**

OTHER SIGNS

- NGP Areas
- Cacao
- 1 — Land limitation
- 116 — Land use

CONVENTIONAL SIGNS

ROADS
- Expressway
- Trunk line
- Primary
- Secondary
- Tertiary

BOUNDARY
- Region
- Province
- District
- Municipality
- Barangay

HYDROLOGY
- Sea / Shoreline
- Lakes / Rivers

PLACES
- Capital City / City
- Capital Town / Town

LAND USE
- Built-up
- Fishpond
- Mangrove

ADJOINING SHEETS

4014-II

4014-II
4013-IV
4013-I

INDEX MAP

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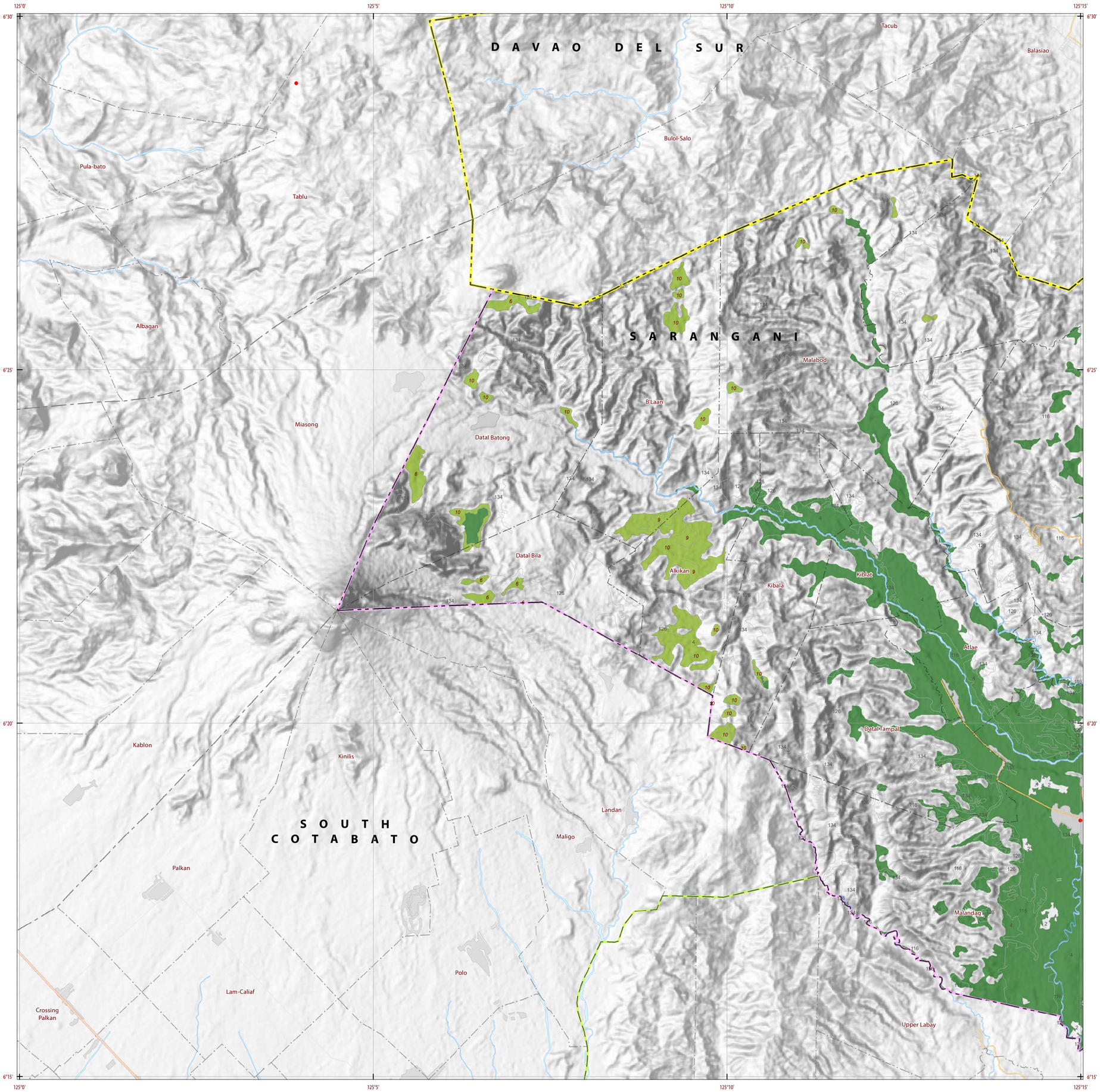

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LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

N
W E
S

SCALE 1 : 50 000

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S3 **Marginally Suitable** - Land having limitations which in aggregate are severe for sustained application of a given use and will so reduce productivity or benefits, or increase required inputs, that this expenditure will be only marginally justified.

Not Suitable/ Not Relevant

OTHER SIGNS

NGP Areas
Cacao
1 Land limitation
118 Land use

CONVENTIONAL SIGNS

ROADS
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Tertiary

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LAND USE
Built-up
Fishpond
Mangrove

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4013-IV
4014-II
4013-IV
4013-I
3913-II
4013-III
4013-II

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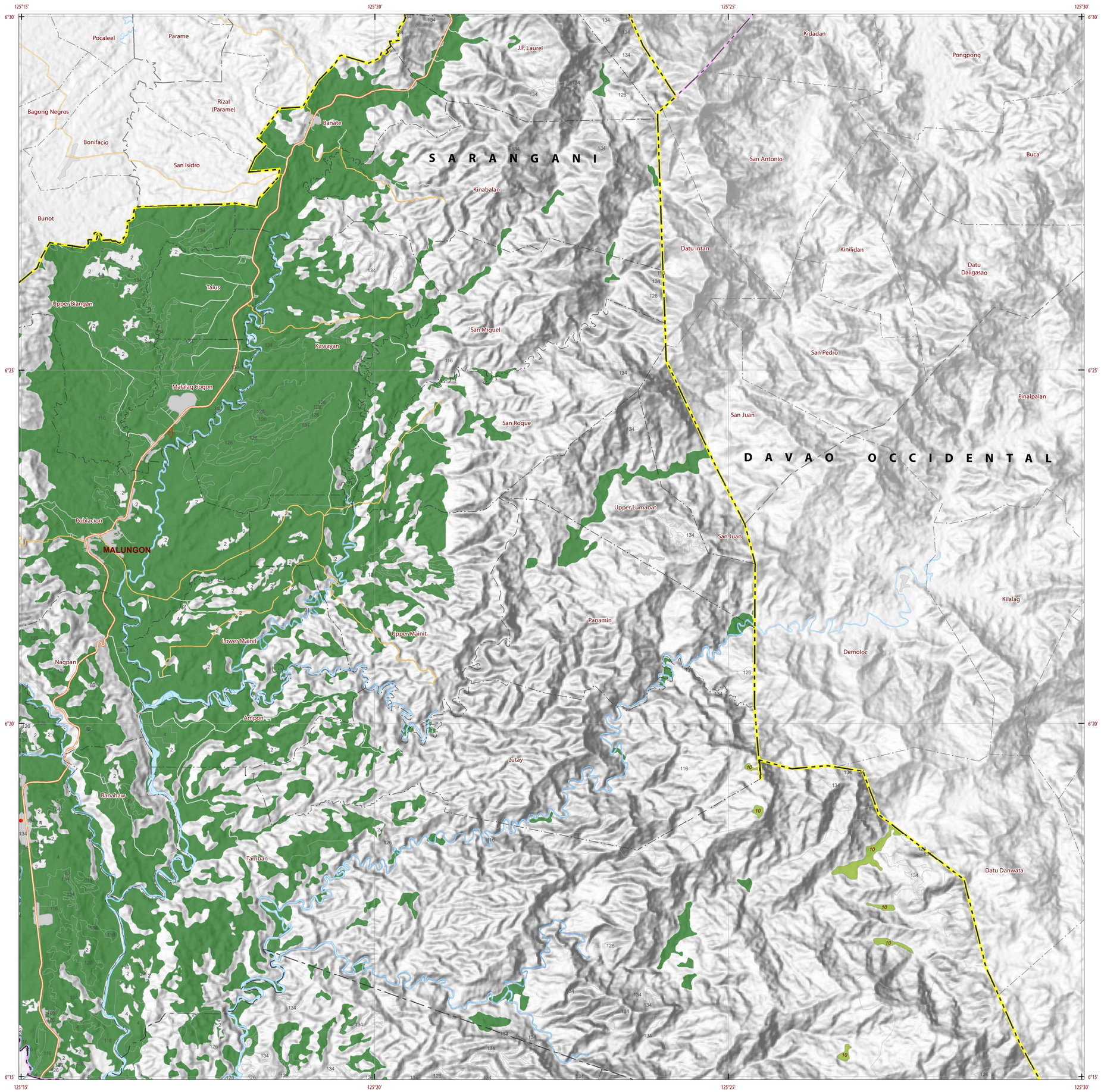
4013-I

PROVINCE OF SARANGANI

Kabayawa



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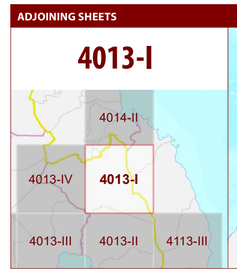

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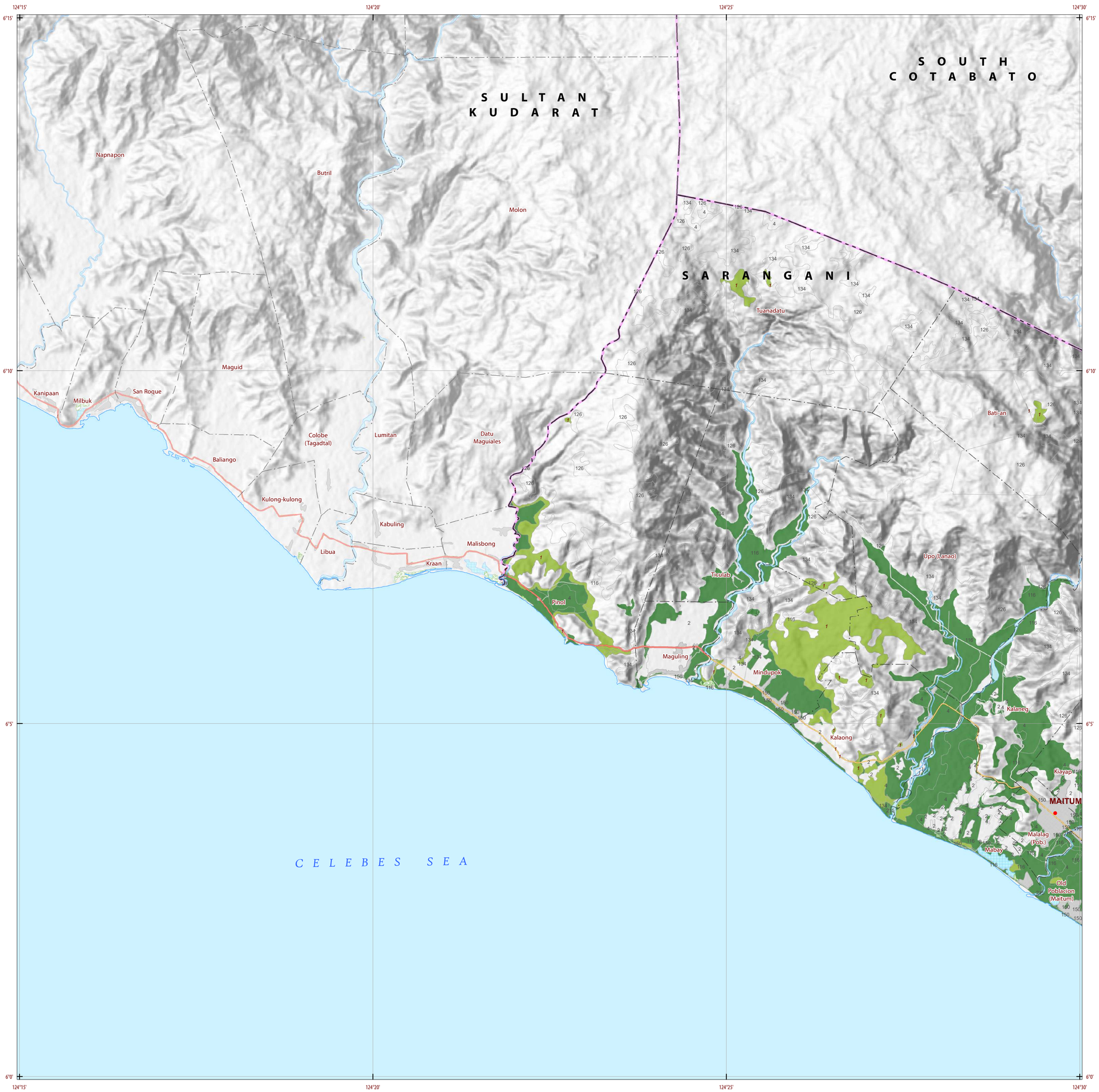

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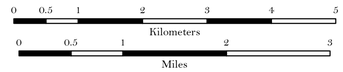
SCALE 1 : 50 000



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LAND USE
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- Fishpond
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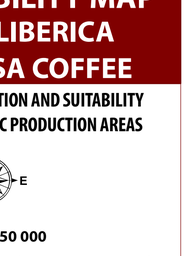
ADJOINING SHEETS

3813-II

3813-II | 3913-III | 3912-IV

INDEX MAP



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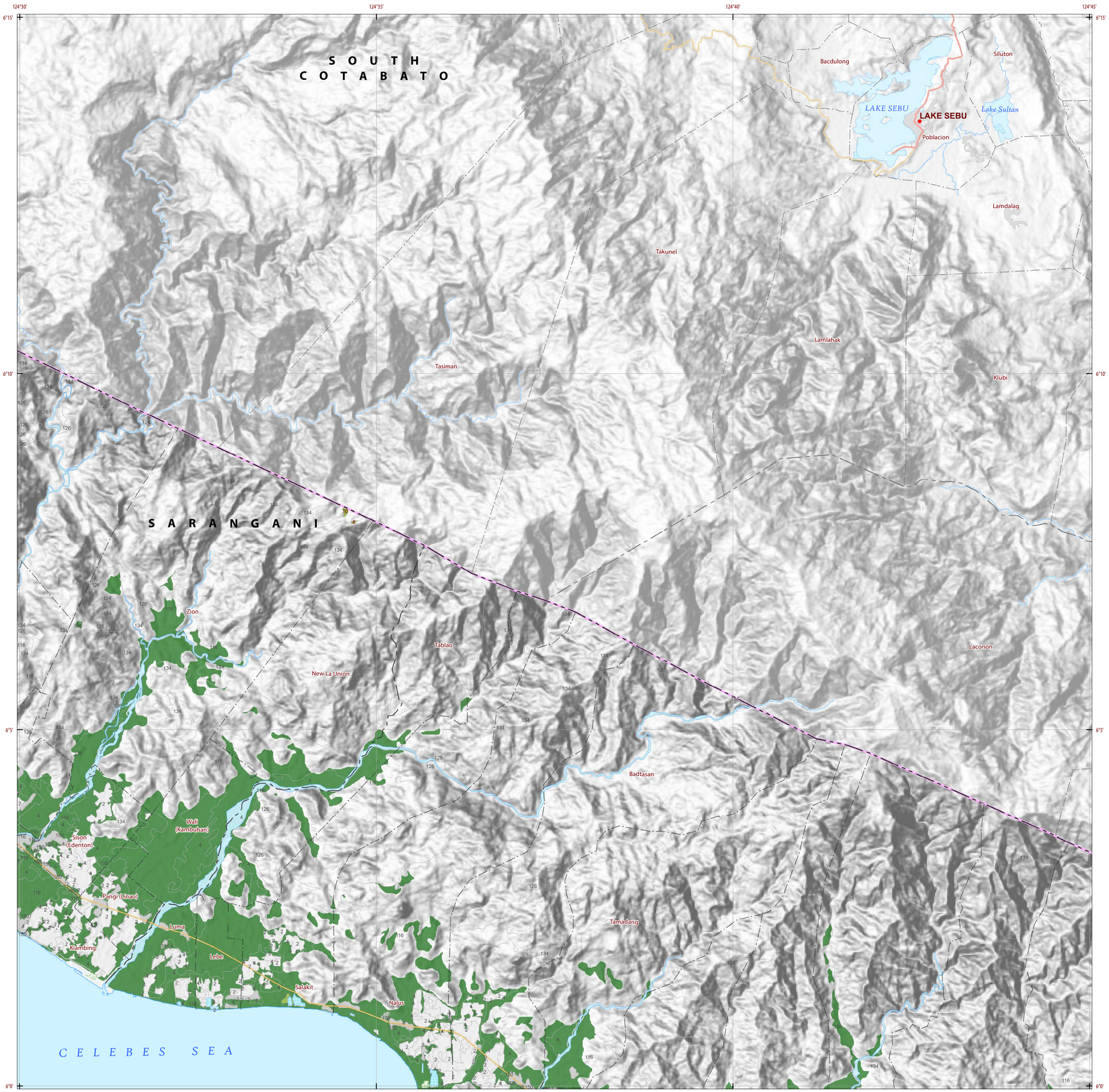

LAND SUITABILITY MAP ROBUSTA, LIBERICA AND EXCELSA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

N W E S

SCALE 1 : 50 000

0 0.5 1 2 3 4 5
Kilometers

0 0.5 1 2 3
Miles

Universal Transverse Mercator Zone 51 N. PRS 1992 Datum
DISCLAIMER : All political boundaries are not authoritative.

LEGEND

SUITABILITY CLASSES

S1 **Highly Suitable** - Land having no significant limitations to sustained application of a given use, or only minor limitations that will not significantly reduce productivity or benefits and will not raise inputs above an acceptable level.

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Not Suitable/ Not Relevant

OTHER SIGNS

NGP Areas
Cacao
1 Land limitation
116 Land use

CONVENTIONAL SIGNS

ROADS
Expressway
Trunk line
Primary
Secondary
Tertiary

BOUNDARY
Region
Province
District
Municipality
Barangay

HYDROLOGY
Sea / Shoreline
Lakes / Rivers

PLACES
Capital City / City
Capital Town / Town

LAND USE
Built-up
Fishpond
Mangrove

ADJOINING SHEETS

3913-III

4013-IV
3813-II
3913-III
3913-II
3912-IV
3912-I

INDEX MAP

MISCELLANEOUS INFORMATION

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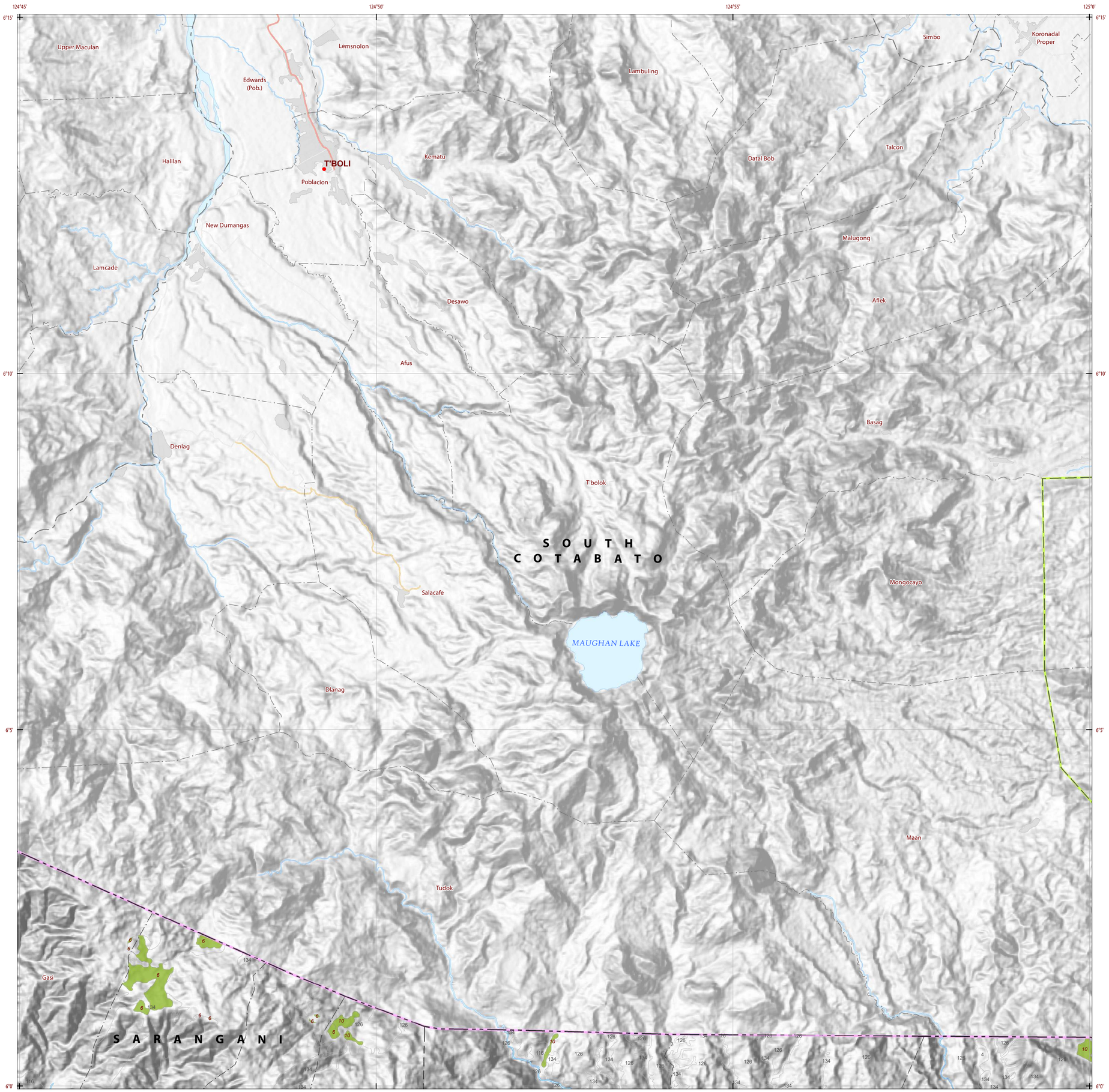

LAND SUITABILITY MAP ROBUSTA, LIBERICA AND EXCELSA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

N
W E
S

SCALE 1 : 50 000

0 0.5 1 2 3 4 5
Kilometers

0 0.5 1 2 3
Miles

Universal Transverse Mercator Zone 51 N. PRS 1992 Datum
DISCLAIMER : All political boundaries are not authoritative.

LEGEND

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Not Suitable/ Not Relevant

OTHER SIGNS

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Cacao
1 Land limitation
116 Land use

CONVENTIONAL SIGNS

ROADS
Expressway
Trunk line
Primary
Secondary
Tertiary

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Province
District
Municipality
Barangay

HYDROLOGY
Sea / Shoreline
Lakes / Rivers

PLACES
Capital City / City
Capital Town / Town

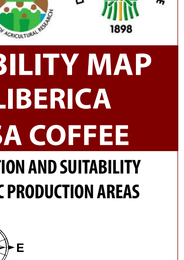
LAND USE
Built-up
Fishpond
Mangrove

ADJOINING SHEETS

3913-II

4013-IV
3913-III 3913-II 4013-III
3912-IV 3912-I 4012-IV

INDEX MAP



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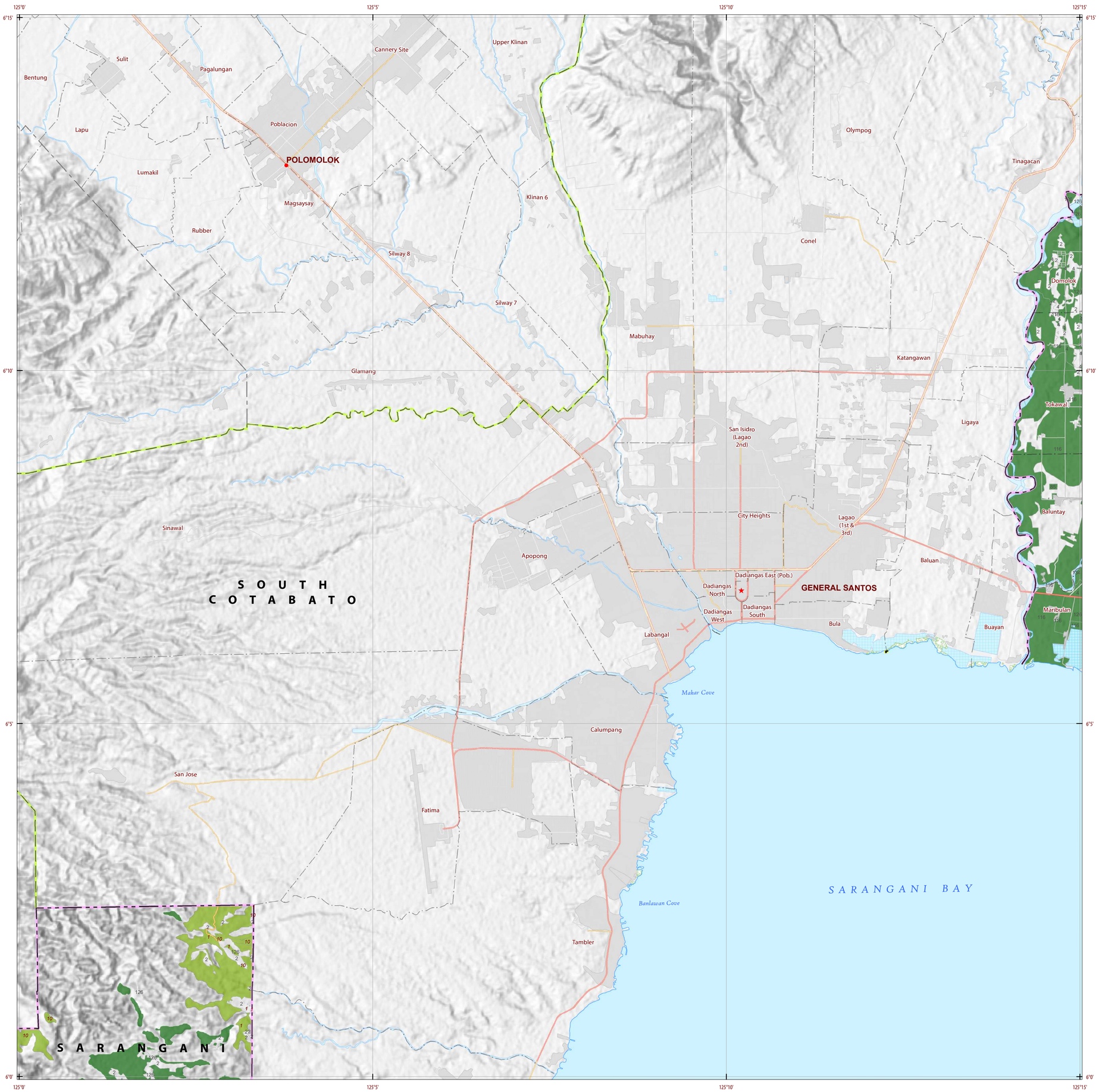

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N
W E
S

SCALE 1 : 50 000

0 0.5 1 2 3 4 5
Kilometers
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Cacao
Land limitation
Land use

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BOUNDARY
Region
Province
District
Municipality
Barangay

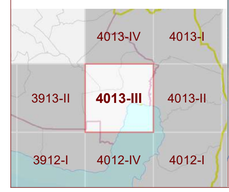
HYDROLOGY
Sea / Shoreline
Lakes / Rivers

PLACES
Capital City / City
Capital Town / Town

LAND USE
Built-up
Fishpond
Mangrove

ADJOINING SHEETS

4013-III



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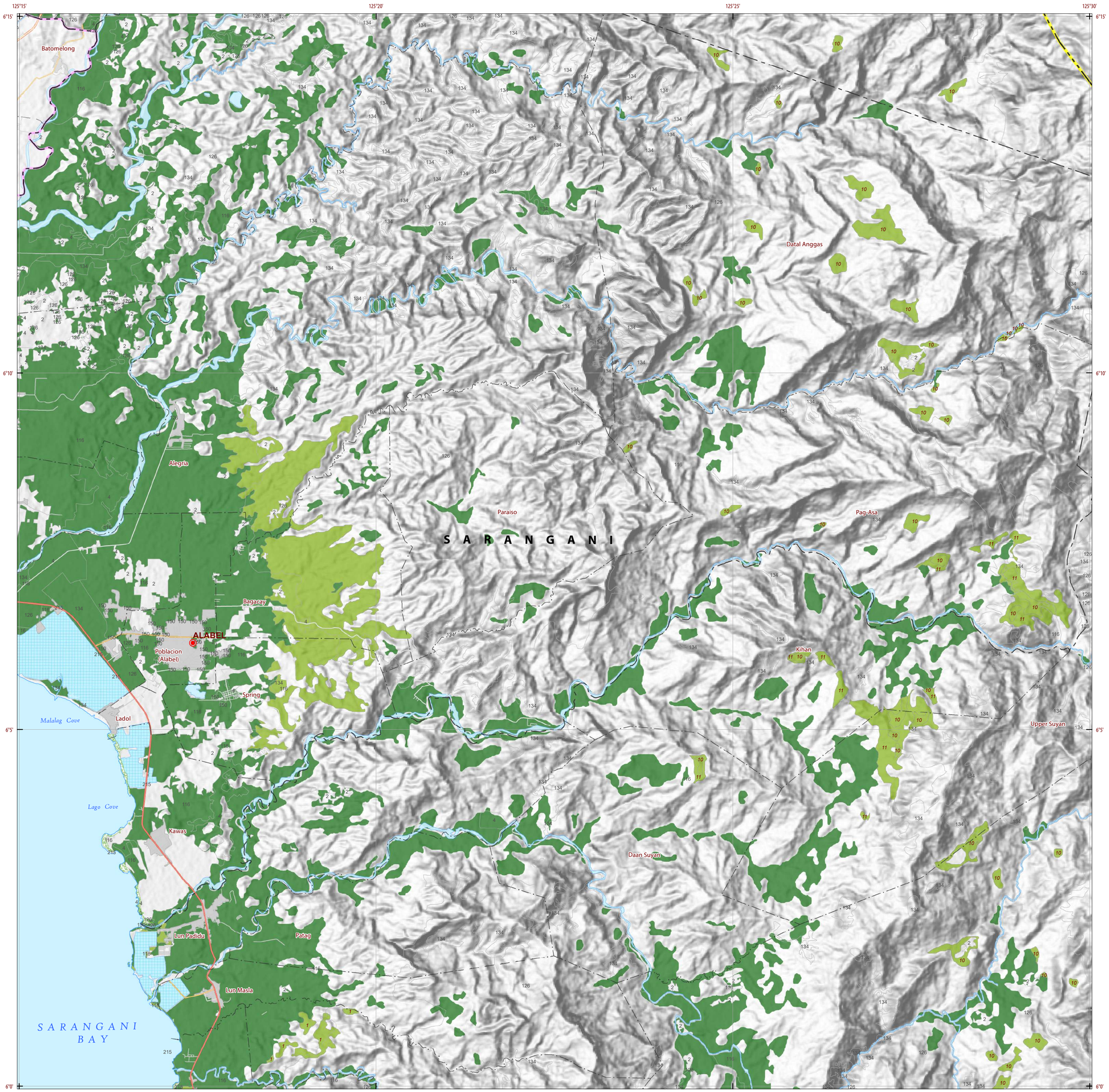

LAND SUITABILITY MAP ROBUSTA, LIBERICA AND EXCELSA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

N
W E
S

SCALE 1 : 50 000

0 0.5 1 2 3 4 5
Kilometers

0 0.5 1 2 3
Miles

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Not Suitable/ Not Relevant

OTHER SIGNS

NGP Areas
Cacao
1 Land limitation
118 Land use

CONVENTIONAL SIGNS

ROADS
Expressway
Trunk line
Primary
Secondary
Tertiary

BOUNDARY
Region
Province
District
Municipality
Barangay

HYDROLOGY
Sea / Shoreline
Lakes / Rivers

PLACES
Capital City / City
Capital Town / Town

LAND USE
Built-up
Fishpond
Mangrove

ADJOINING SHEETS

4013-II

4013-IV | 4013-I
4013-III | 4013-II | 4113-III
4012-IV | 4012-I | 4112-IV

INDEX MAP

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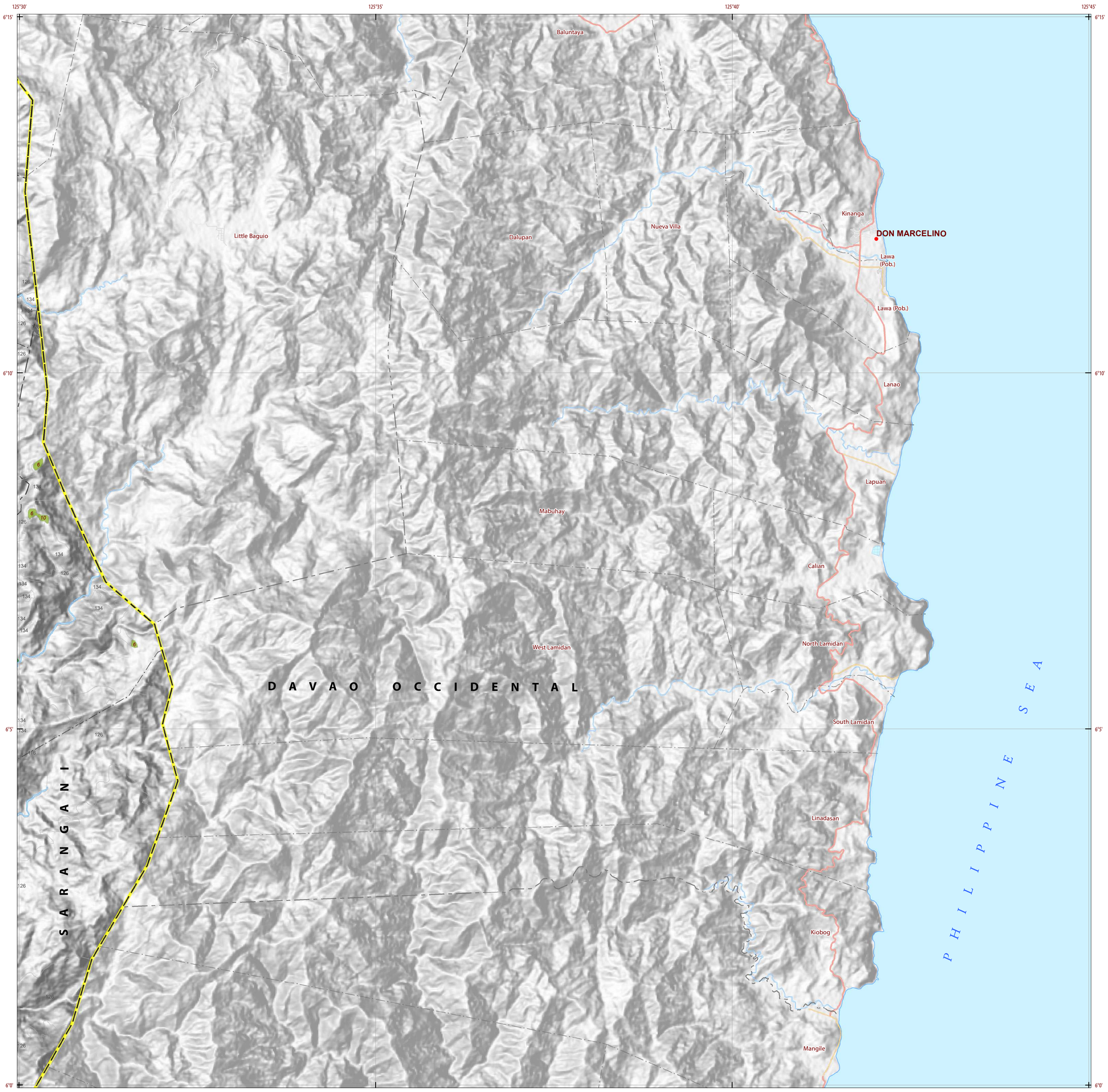

LAND SUITABILITY MAP ROBUSTA, LIBERICA AND EXCELSA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

N
W E
S

SCALE 1 : 50 000

0 0.5 1 2 3 4 5
Kilometers
0 0.5 1 2 3
Miles

Universal Transverse Mercator Zone 51 N. PRS 1992 Datum
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LEGEND

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Not Suitable/ Not Relevant

OTHER SIGNS

NGP Areas
Cacao
1 Land limitation
116 Land use

CONVENTIONAL SIGNS

ROADS
Expressway
Trunk line
Primary
Secondary
Tertiary

BOUNDARY
Region
Province
District
Municipality
Barangay

HYDROLOGY
Sea / Shoreline
Lakes / Rivers

PLACES
Capital City / City
Capital Town / Town

LAND USE
Built-up
Fishpond
Mangrove

ADJOINING SHEETS

4113-III

4013-I
4013-II
4113-III
4012-I
4112-IV

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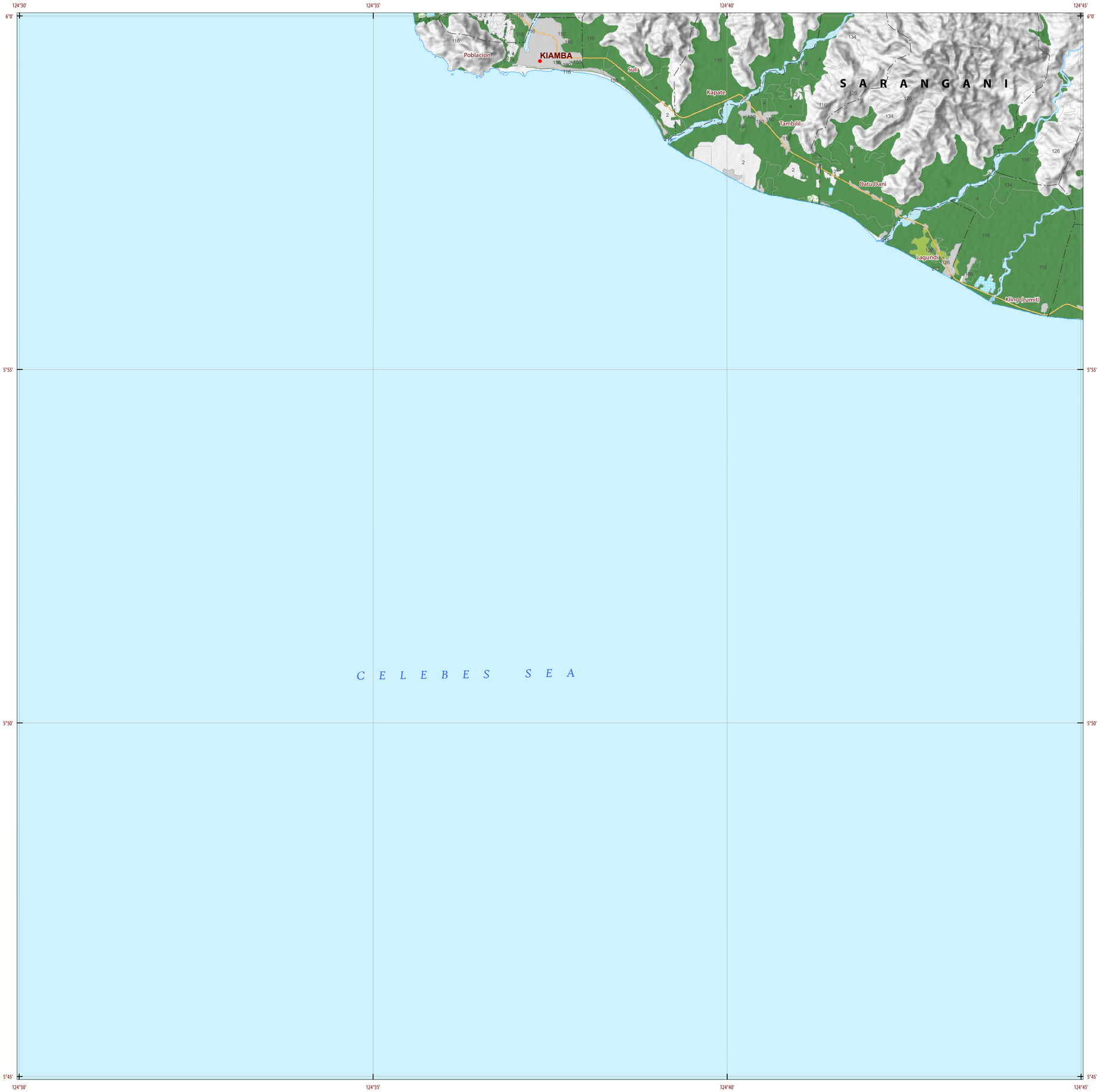

LAND SUITABILITY MAP ROBUSTA, LIBERICA AND EXCELSA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

N
W E
S

SCALE 1 : 50 000

0 0.5 1 2 3 4 5
Kilometers

0 0.5 1 2 3
Miles

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Cacao
1 Land limitation
116 Land use

CONVENTIONAL SIGNS

ROADS
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Trunk line
Primary
Secondary
Tertiary

BOUNDARY
Region
Province
District
Municipality
Barangay

HYDROLOGY
Sea / Shoreline
Lakes / Rivers

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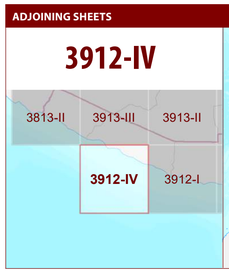
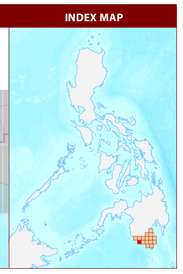
Capital City / City
Capital Town / Town

LAND USE
Built-up
Fishpond
Mangrove

ADJOINING SHEETS



INDEX MAP



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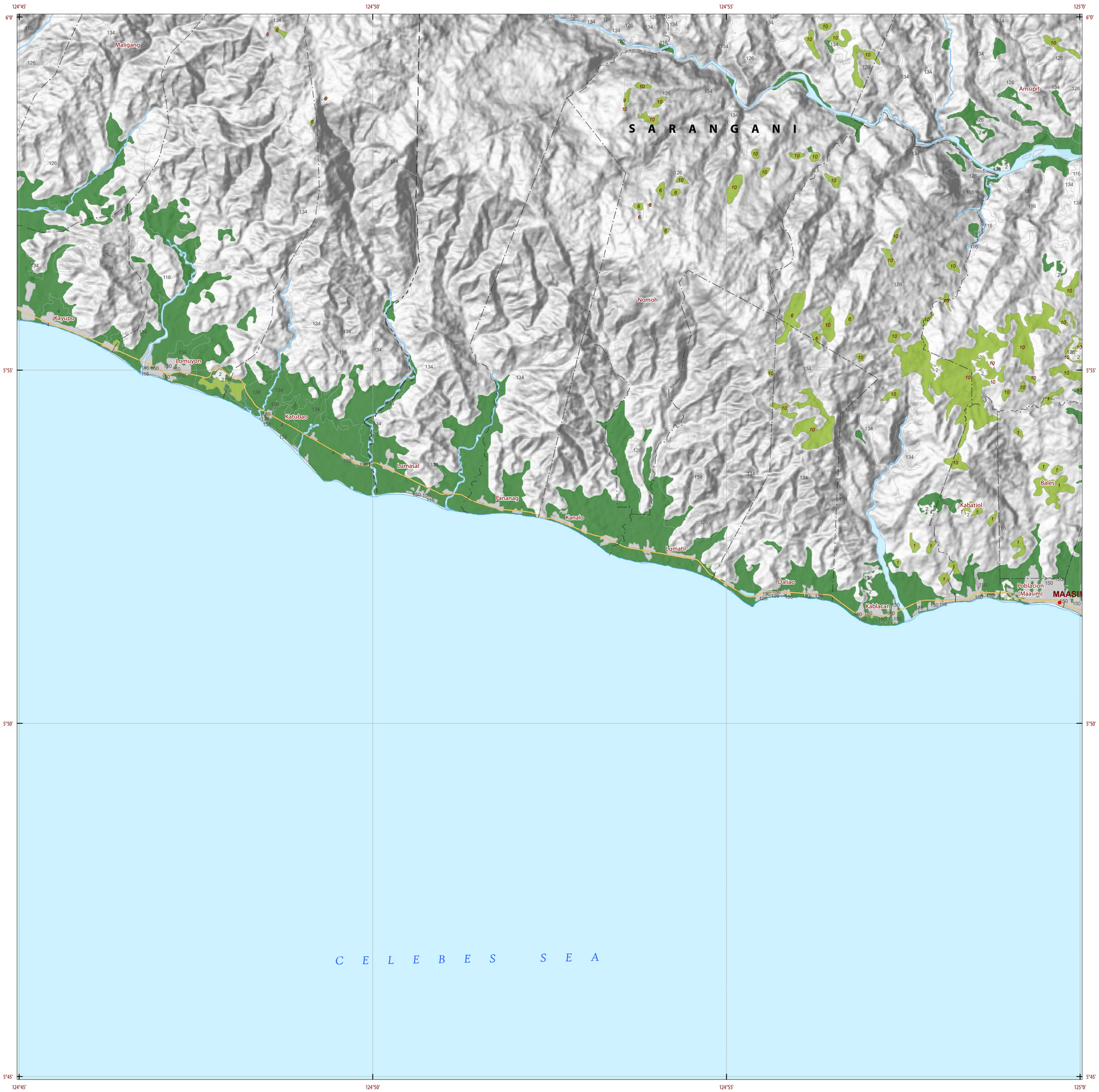

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LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

N
W E
S

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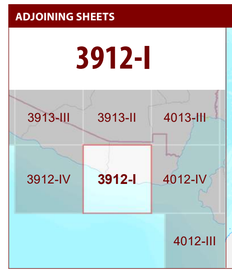

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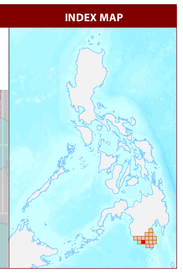

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PROVINCE OF SARANGANI

LAND SUITABILITY MAP ROBUSTA, LIBERICA AND EXCELSA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

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W E
S

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S3 **Marginally Suitable** - Land having limitations which in aggregate are severe for sustained application of a given use and will so reduce productivity or benefits, or increase required inputs, that this expenditure will be only marginally justified.

Not Suitable/ Not Relevant

OTHER SIGNS

NGP Areas
Cacao
Land limitation
Land use

CONVENTIONAL SIGNS

ROADS
Expressway
Trunk line
Primary
Secondary
Tertiary

BOUNDARY
Region
Province
District
Municipality
Barangay

HYDROLOGY
Sea / Shoreline
Lakes / Rivers

PLACES
Capital City / City
Capital Town / Town

LAND USE
Built-up
Fishpond
Mangrove

ADJOINING SHEETS

4012-IV

3913-II | 4013-III | 4013-II
3912-I | 4012-IV | 4012-I
4012-III | 4012-II

INDEX MAP

MISCELLANEOUS INFORMATION

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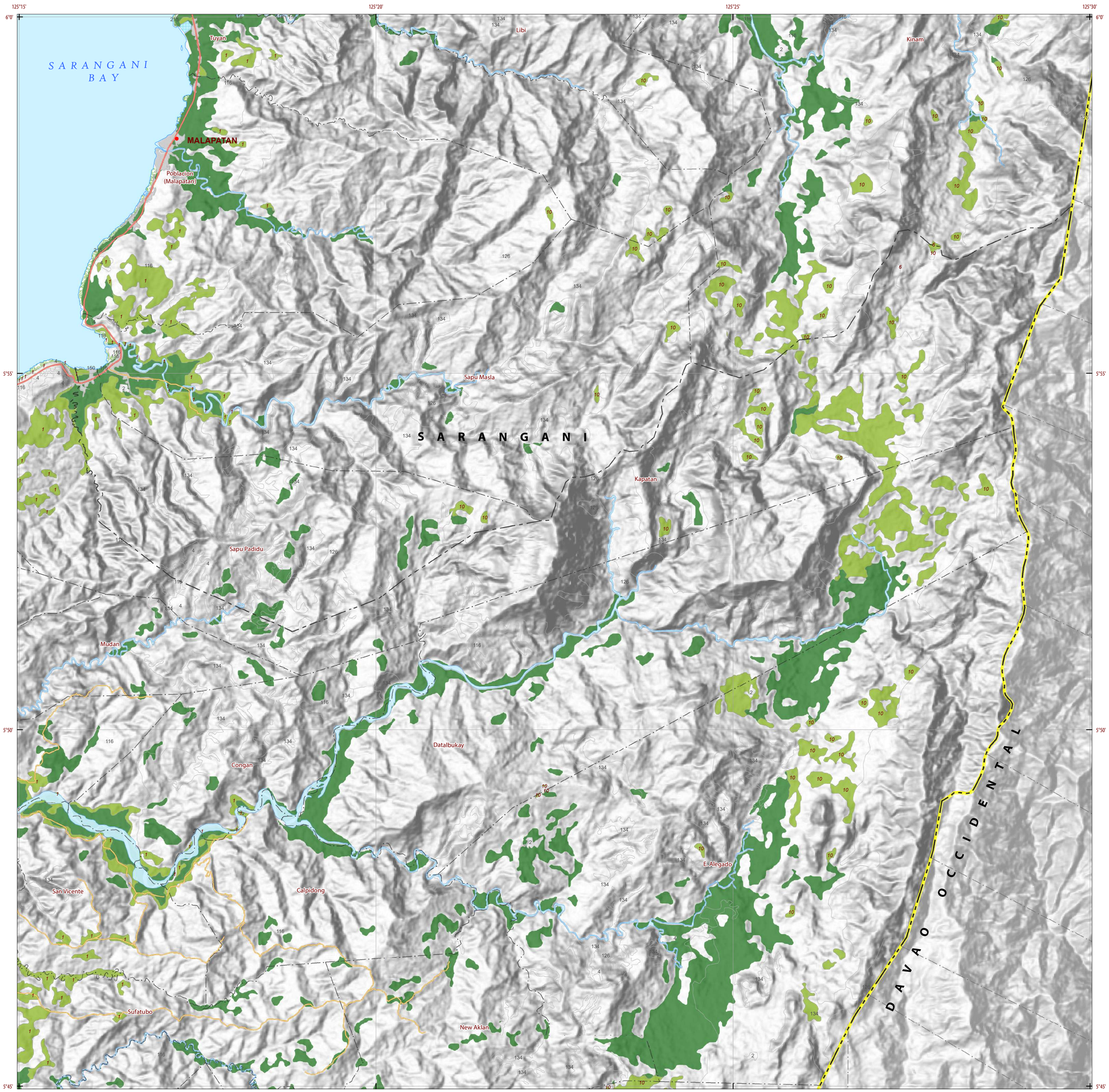

LAND SUITABILITY MAP ROBUSTA, LIBERICA AND EXCELSA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

N W E S

SCALE 1 : 50 000

0 0.5 1 2 3 4 5 Kilometers

0 0.5 1 2 3 Miles

Universal Transverse Mercator Zone 51 N. PRS 1992 Datum

DISCLAIMER : All political boundaries are not authoritative.

LEGEND

SUITABILITY CLASSES

- S1 **Highly Suitable** - Land having no significant limitations to sustained application of a given use, or only minor limitations that will not significantly reduce productivity or benefits and will not raise inputs above an acceptable level.
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- **Not Suitable/ Not Relevant**

OTHER SIGNS

- NGP Areas
- Cacao
- 1 Land limitation
- 116 Land use

CONVENTIONAL SIGNS

ROADS
- Expressway
- Trunk line
- Primary
- Secondary
- Tertiary

BOUNDARY
- Region
- Province
- District
- Municipality
- Barangay

HYDROLOGY
- Sea / Shoreline
- Lakes / Rivers

PLACES
- Capital City / City
- Capital Town / Town

LAND USE
- Built-up
- Fishpond
- Mangrove

ADJOINING SHEETS

4012-I

4013-III | 4013-II | 4113-III
4012-IV | 4012-I | 4112-IV
4012-III | 4012-II

INDEX MAP

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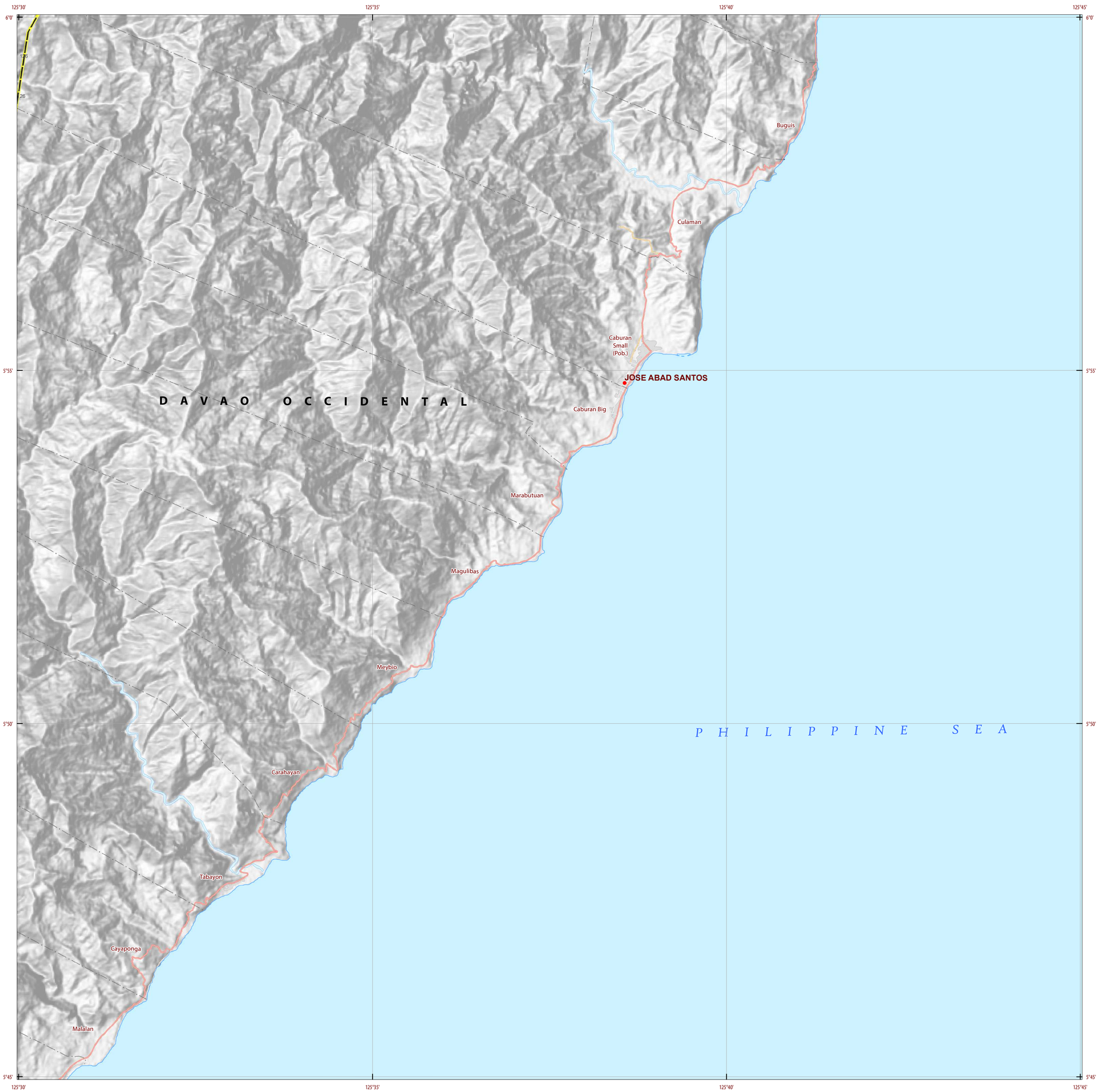

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LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

N
W E
S

SCALE 1 : 50 000

0 0.5 1 2 3 4 5
Kilometers

0 0.5 1 2 3
Miles

Universal Transverse Mercator Zone 51 N. PRS 1992 Datum
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Not Suitable/ Not Relevant

OTHER SIGNS

NGP Areas
Cacao
1 Land limitation
118 Land use

CONVENTIONAL SIGNS

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Primary
Secondary
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HYDROLOGY
Sea / Shoreline
Lakes / Rivers

PLACES
Capital City / City
Capital Town / Town

LAND USE
Built-up
Fishpond
Mangrove

ADJOINING SHEETS

4112-IV

4013-II
4113-III
4012-I
4112-IV
4012-II

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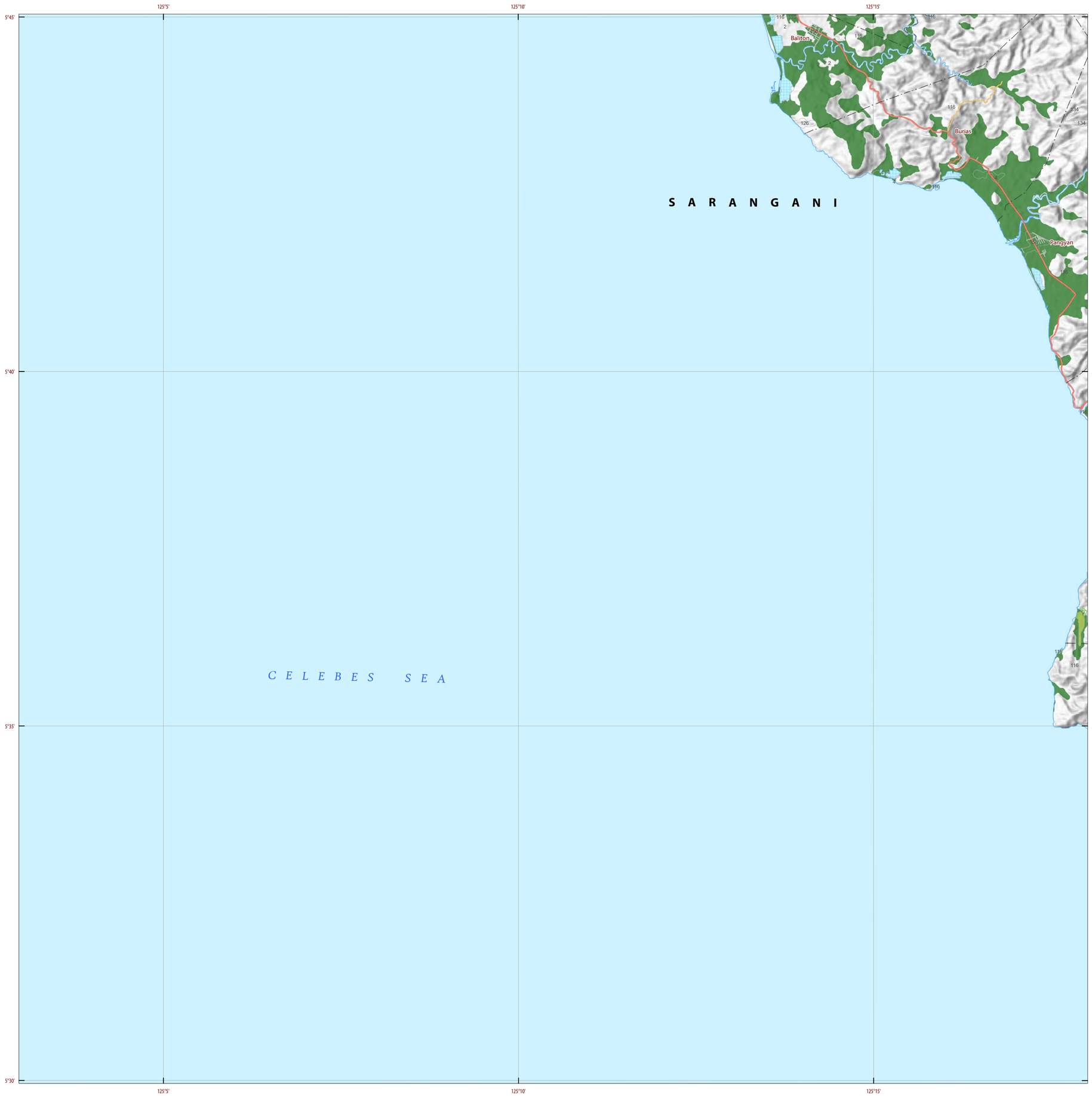

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N
W E
S

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