

LAND SUITABILITY MAP

ARABICA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

PROVINCE OF BENGUET



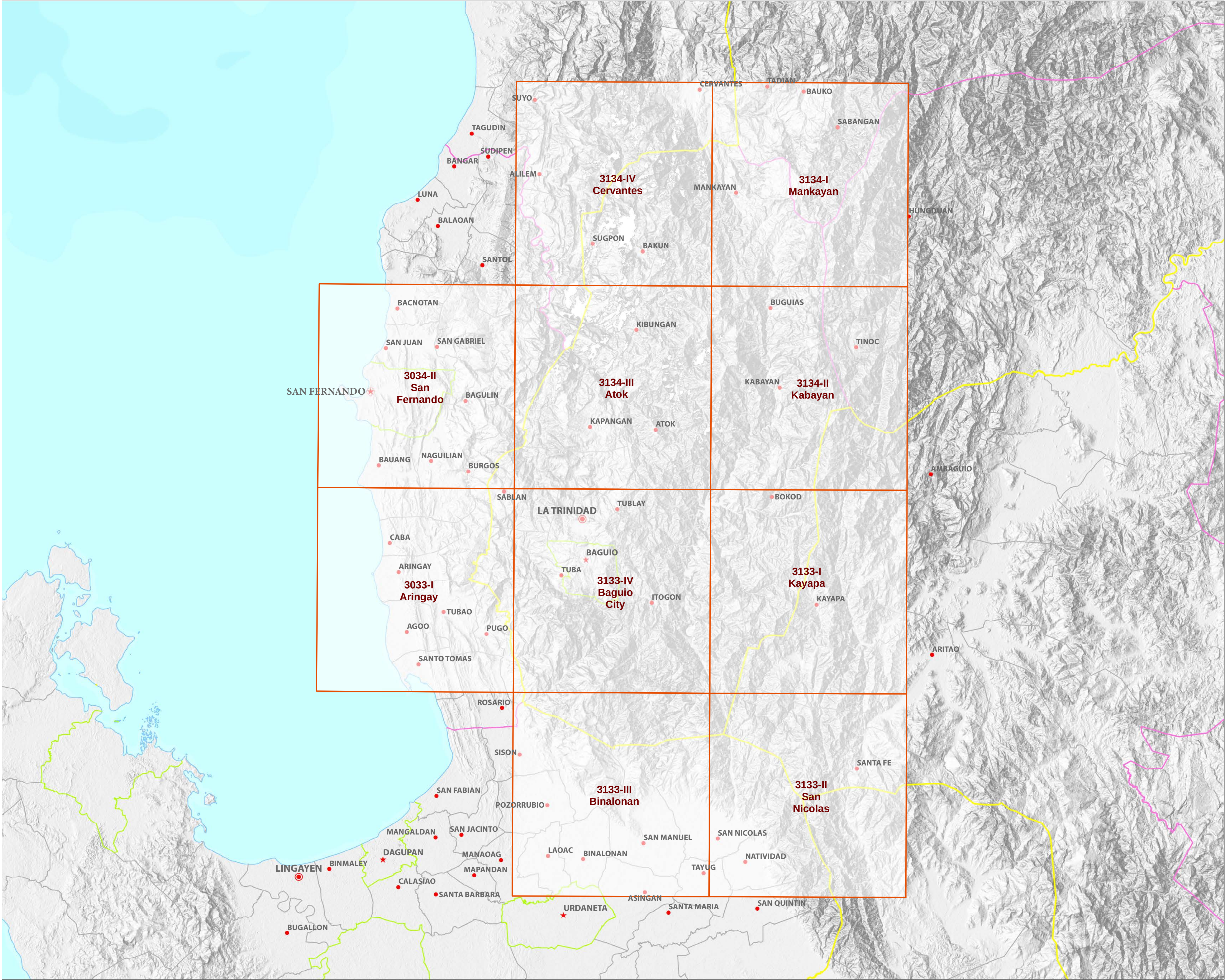
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF AGRICULTURE
BUREAU OF SOILS AND WATER MANAGEMENT

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MAP INDEX

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

PROVINCE OF BENGUET



LEGEND

Places

- ★ Capital City
- ★ City
- Capital Town
- Town

Administrative Boundary

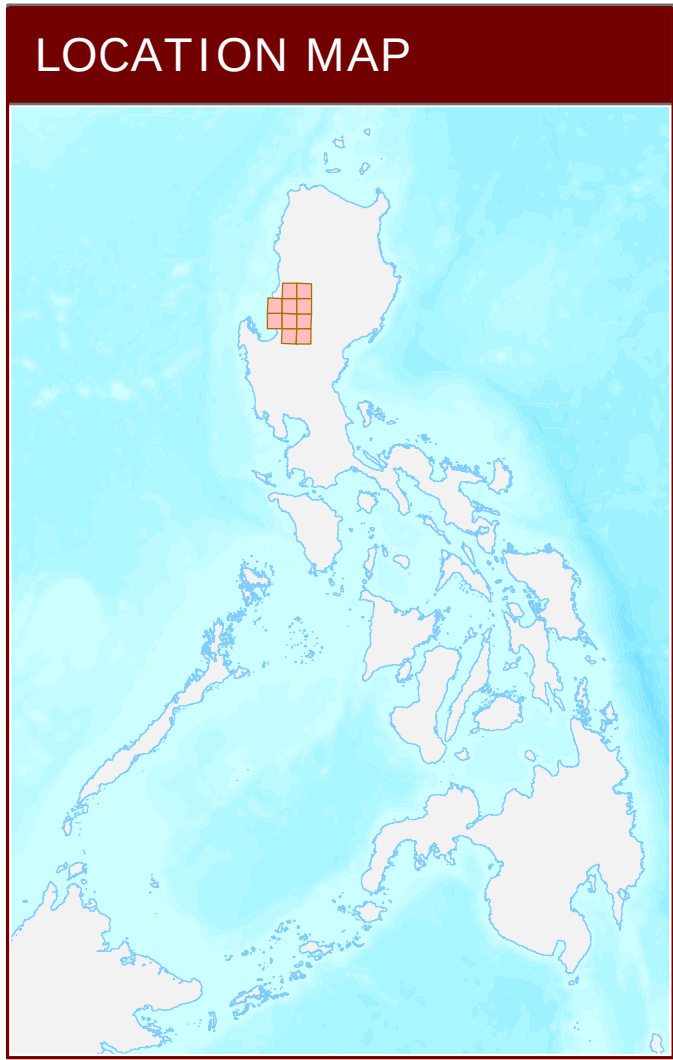
- Regional
- Provincial
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- Municipal

Map Index

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Topographic Relief

Bathymetry



LAND SUITABILITY MAP FOR ARABICA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS BENGUET, CAR

EXTENT OF SUITABILITY FOR ARABICA COFFEE PRODUCTION BY MUNICIPALITY

MUNICIPALITY	EXISTING COFFEE (Ha)			TOTAL EXISTING AREA (Ha)	EXPANSION AREA (Ha)						CONFLICT RESOLUTION (Ha)						TOTAL POTENTIAL EXPANSION AREA (Ha)
					Coconut		Shrubland, unmanaged*		Grassland, unmanaged*		Vegetable		Rice paddy, non-irrigated		Other crops		
	S1	S2	S3		S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	
ATOK	-		66	66	-	-	-	-	-	30	-	4	-	-	-	-	34
BAGUIO CITY	-		1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
BAKUN	-	3	54	57	-	-	-	55	-	78	-	18	-	-	-	-	151
BOKOD	-		56	56	-	-	-	8	-	25	-	-	-	-	-	-	33
BUGUIAS	-		64	64	-	-	-	-	-	14	98	265	-	-	-	-	376
ITOGON	-	1	36	37	-	-	-	-	-	16	-	-	-	-	-	-	16
KABAYAN	-		7	7	-	-	-	-	-	45	-	31	-	-	-	-	76
KAPANGAN	-		10	10	-	-	-	-	-	24	-	1	-	-	-	-	25
KIBUNGAN	-	2	19	21	-	-	-	-	-	13	7	13	-	-	-	-	34
LA TRINIDAD	-		5	5	-	-	-	-	1	-	171	-	-	-	-	-	172
MANKAYAN	-	7	13	20	-	-	-	-	-	7	-	636	-	-	-	-	643
SABLAN	-		4	4	-	-	-	2	-	1	-	-	-	5	-	-	9
TUBA	-	6	23	29	-	-	-	-	6	51	-	-	-	-	-	-	58
TUBLAY	-		18	18	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	-	20	376	396	-	-	-	65	7	304	276	969	-	5	-	-	1,626

Note: Delivery of coffee planting materials must be started on the onset of rainy season.
*establishment of shade trees prior to planting of 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 ARABICA 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 (Arabica)	S1	<8	>100	CL, SICL, SCL, SC, SIC, C, HC	WD,MWD	5.6 - 7.2	high	none-slight	none-slight	none-few	1000-2000	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	500-1000 2000-2500	1000-2000	I, II
	S3	>30	<30	S, LS, CSL, SL	VPD,ED	<5.0 - > 7.9	low	severe	severe	many	<500 >2500	<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 DEPTH (cm)

0 - 30	- very shallow
30 - 50	- shallow
50 - 100	- moderately deep
> 100	- deep to very deep

SOIL DRAINAGE

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

SURFACE IMPEDIMENT

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

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

LAND LIMITATIONS DESCRIPTION AND COMBINATIONS

ELEVATION

EI2	- 500 - 1000m or 2000 - 2500m
EI3	- < 500m or > 2500m

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
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ROCK OUTCROPS

Rc2	- Common
Rc3	- Many

FLOODING

F2	- Moderate seasonal flooding
F3	- Severe seasonal flooding

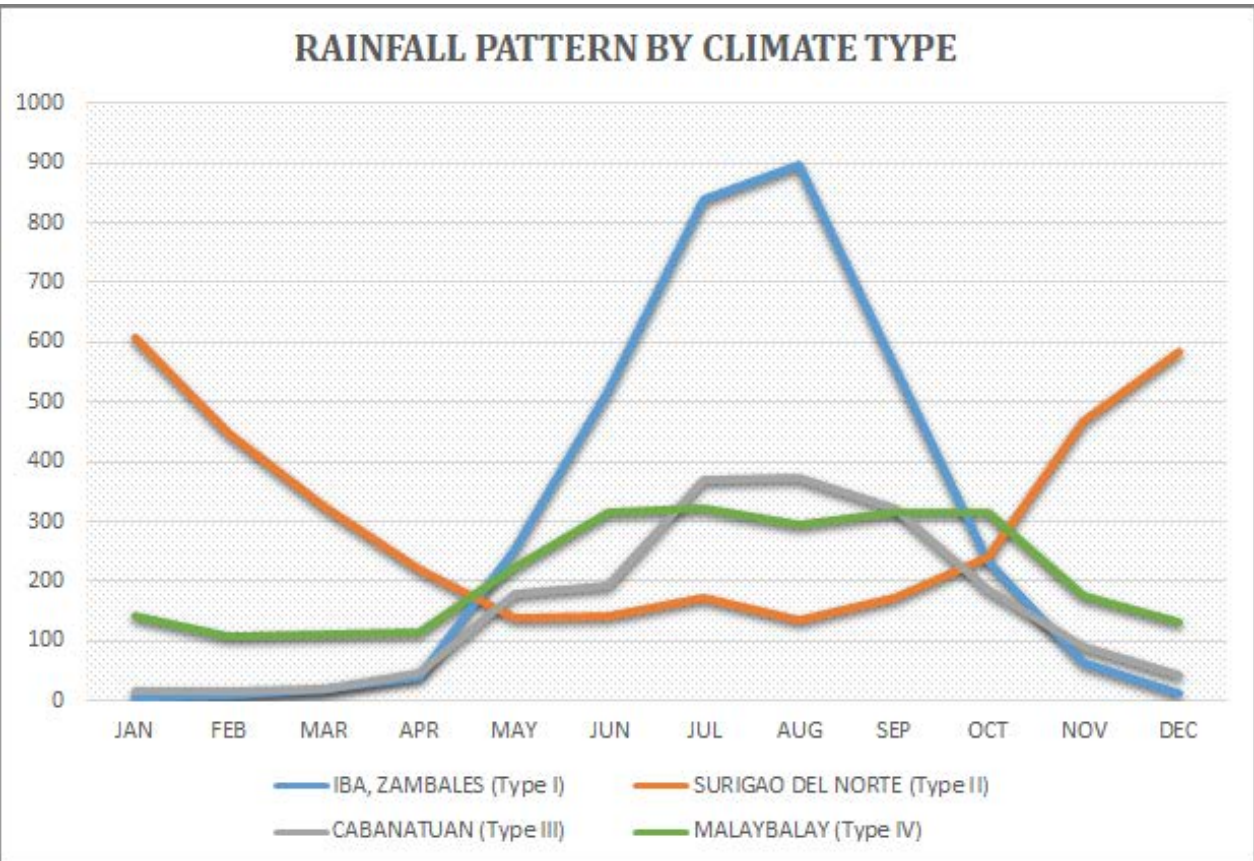
CODE	LAND LIMITATION	CODE	LAND LIMITATION	CODE	LAND LIMITATION	CODE	LAND LIMITATION
1	E2-Sh2-Rc3	11	T2	21	T2-EI2-E3-Sh2-Rc2	31	T3-EI2-E3
2	E3-Sh2-Rc3	12	T2-E3	22	T2-EI2-E3-Sh2-Rc3	32	T3-EI2-E3-Rc2
3	EI2	13	T2-E3-Rc2	23	T3	33	T3-EI2-E3-Rc3
4	EI2-E2-Sh2-Rc3	14	T2-E3-Rc3	24	T3-E3	34	T3-EI2-E3-Sh2-Rc3
5	EI2-E3-Sh2-Rc3	15	T2-E3-Sh2-Rc2	25	T3-E3-Rc2	35	T3-EI2-E3-Sh3-Rc2
6	EI2-Rc2	16	T2-E3-Sh2-Rc3	26	T3-E3-Rc3	36	T3-EI2-E3-Sh3-Rc3
7	EI2-Sh2-Rc2	17	T2-EI2	27	T3-E3-Sh2-Rc3		
8	EI2-Sh2-Rc3	18	T2-EI2-E3	28	T3-E3-Sh3-Rc2		
9	Sh2-Rc2	19	T2-EI2-E3-Rc2	29	T3-E3-Sh3-Rc3		
10	Sh2-Rc3	20	T2-EI2-E3-Rc3	30	T3-EI2		

CODE	LAN DUSE
2	Paddy rice, non-irrigated
47	Vegetable
81	Coffee
126	Grassland
133	Bamboo
134	Shrubland, unmanaged

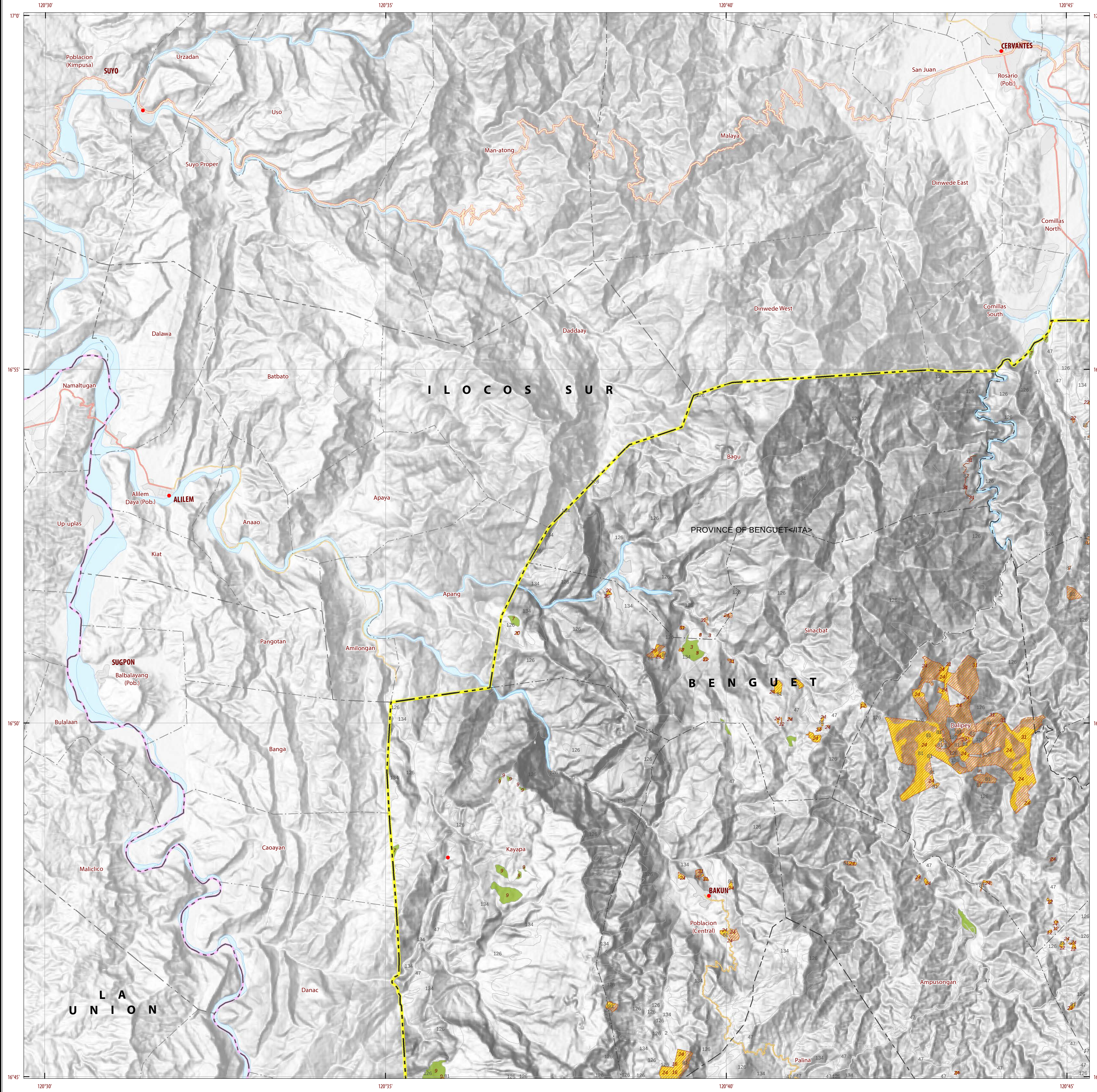
CLIMATE TYPE

TYPE I : Two pronounced 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.

The whole part of Benguet classified as climatic Type I.

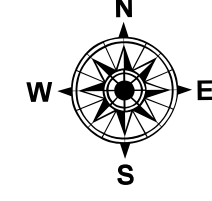


Source: PAGASA 2018, *Climatological Normals (Rainfall)*, Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), accessed 27 July 2018, <<https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>>.

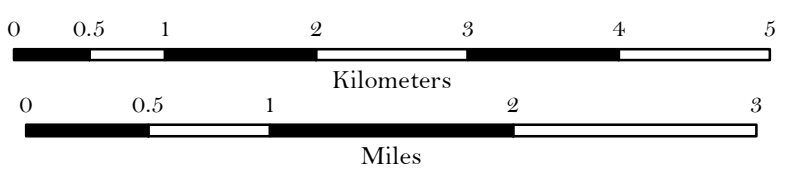


LAND SUITABILITY MAP ARABICA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS



SCALE 1 : 50 000



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
- Coffee
- Land limitation
- Land use

CONVENTIONAL SIGNS

ROADS

- Expressway
- Trunk line
- Primary
- Secondary
- Tertiary

BOUNDARY

- Region
- Province
- District
- Municipality
- Barangay

HYDROLOGY

- Sea / Shoreline
- Lakes / Rivers

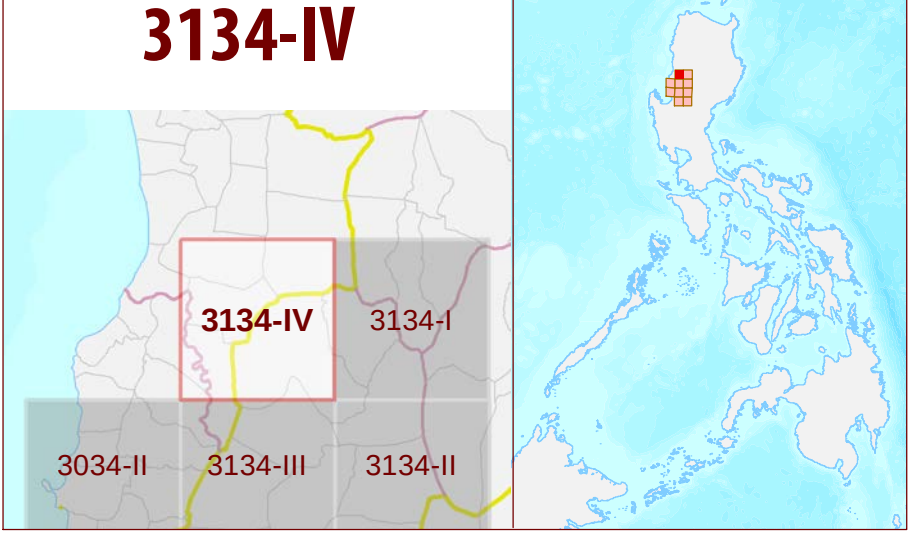
PLACES

- Capital City / City
- Capital Town / Town

LAND USE

- Built-up
- Fishpond
- Mangrove

ADJOINING SHEETS



MISCELLANEOUS INFORMATION

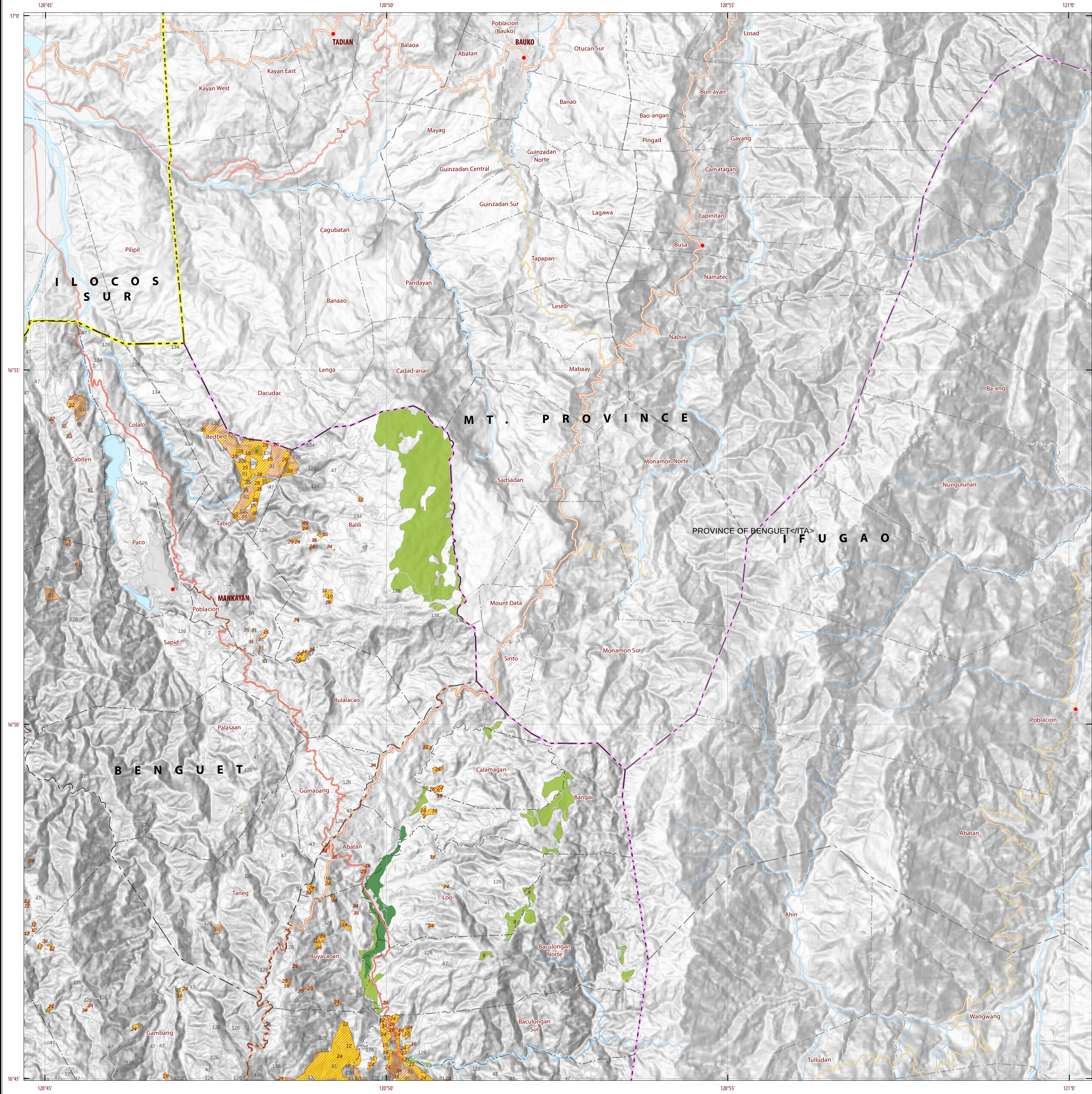
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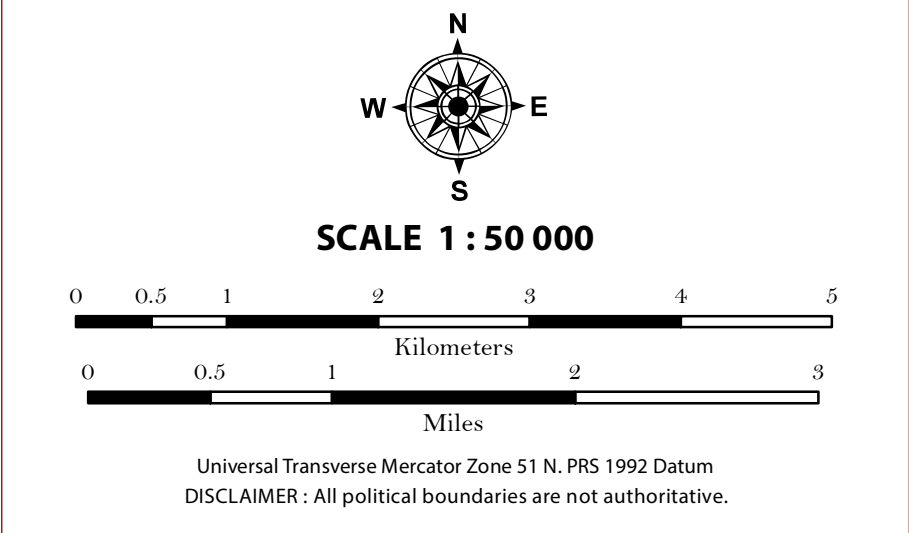
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LAND SUITABILITY MAP
ARABICA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY
ASSESSMENT OF STRATEGIC PRODUCTION AREAS



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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

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ADJOINING SHEETS

3134-I

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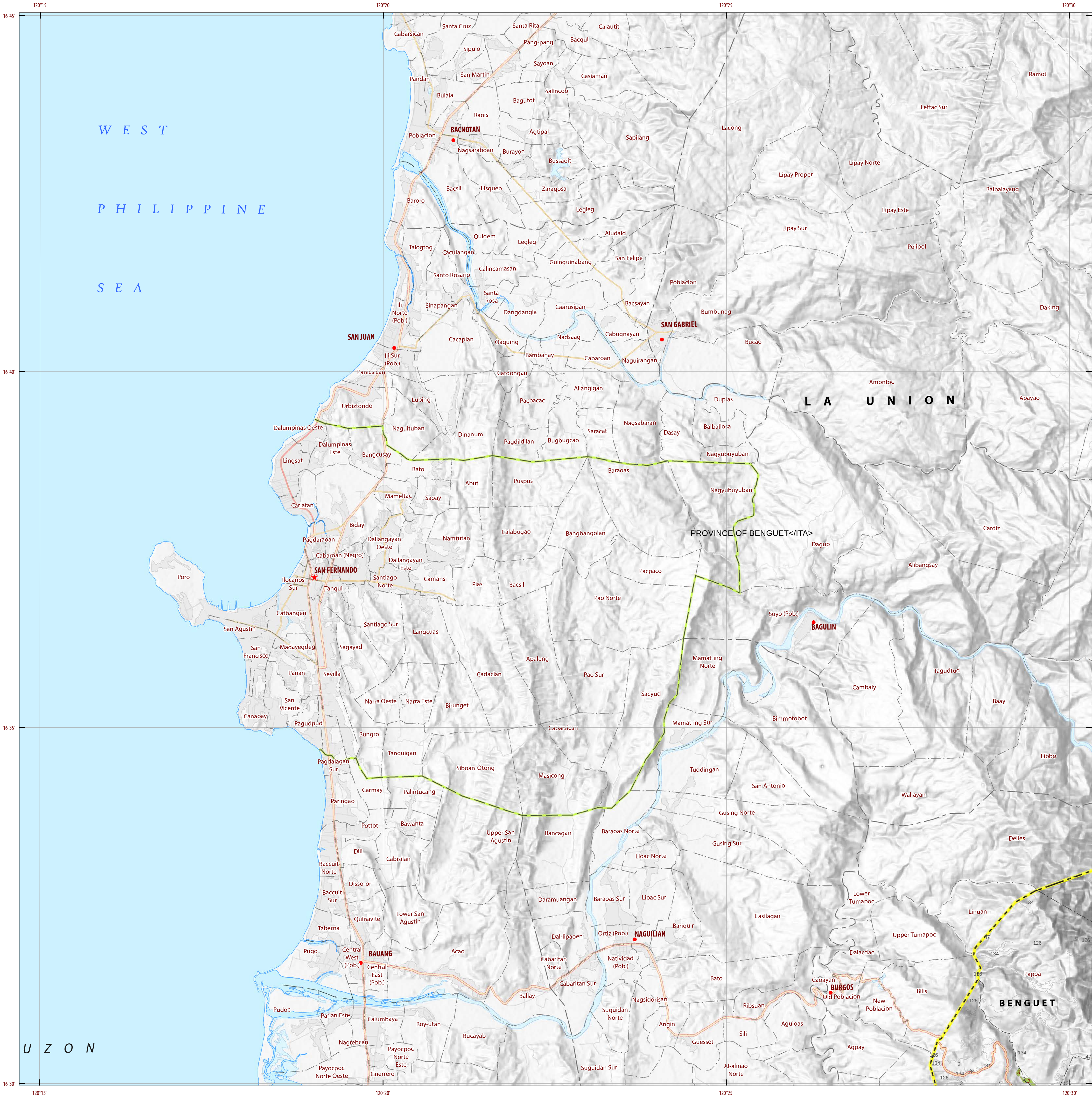
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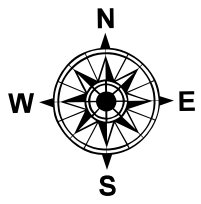
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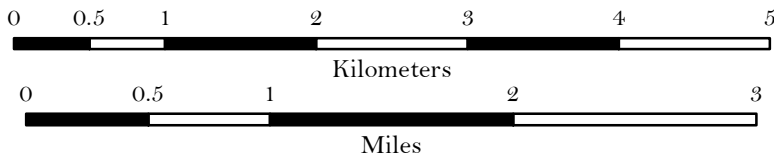


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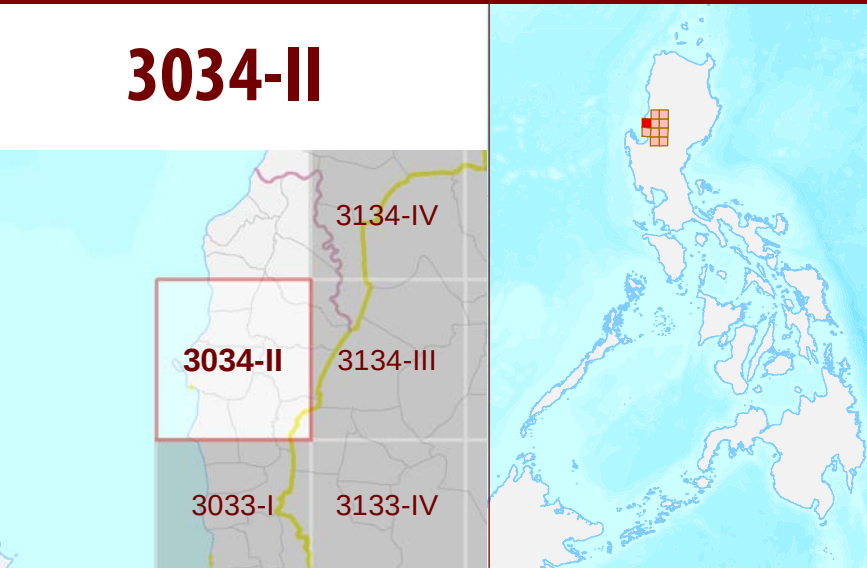
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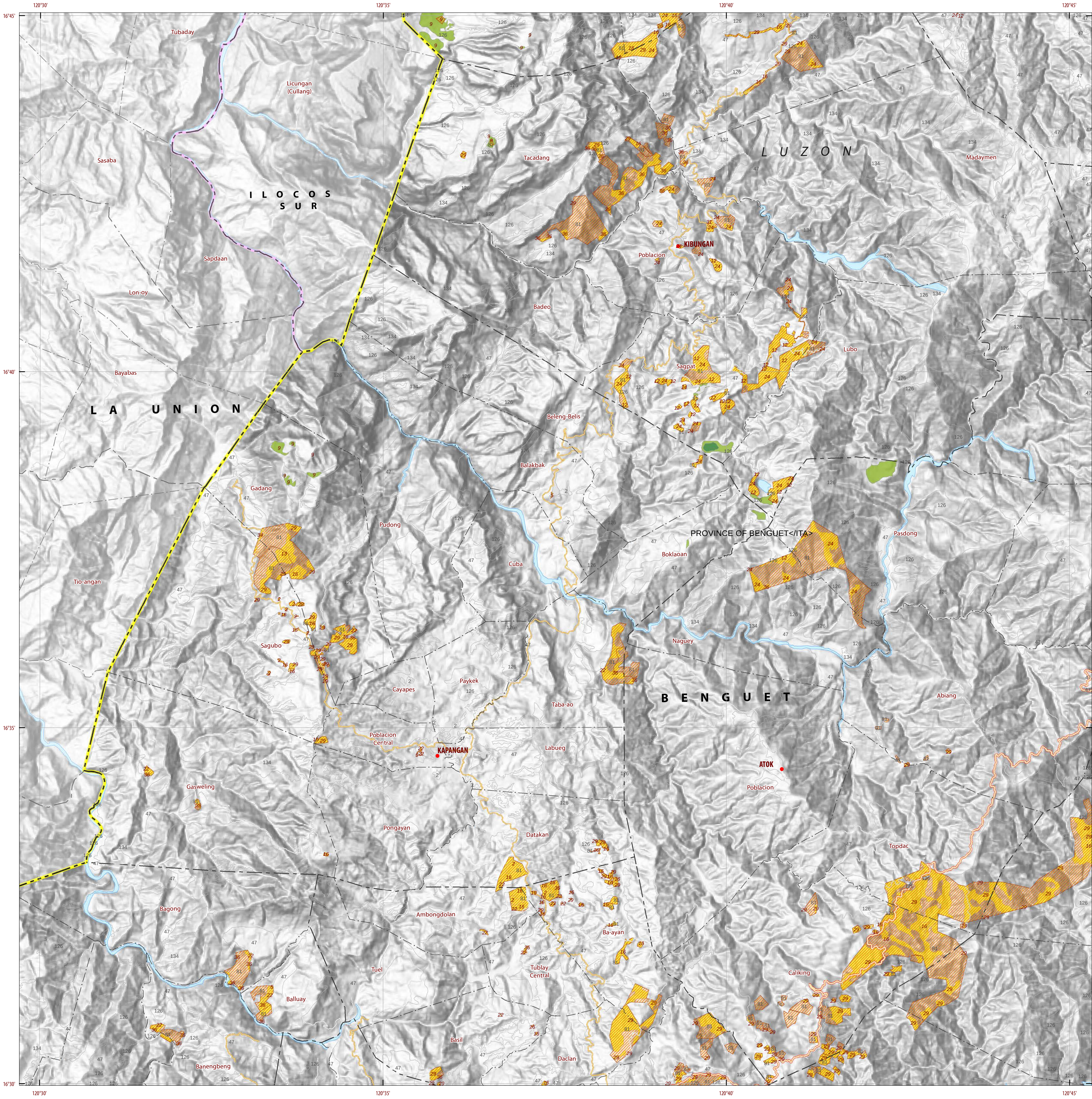
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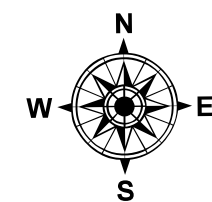
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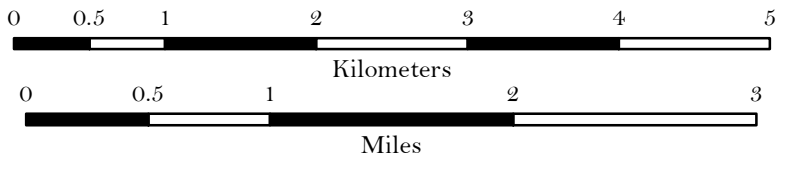


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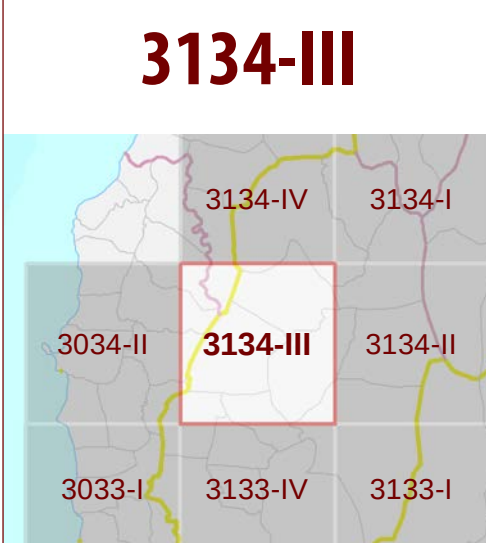
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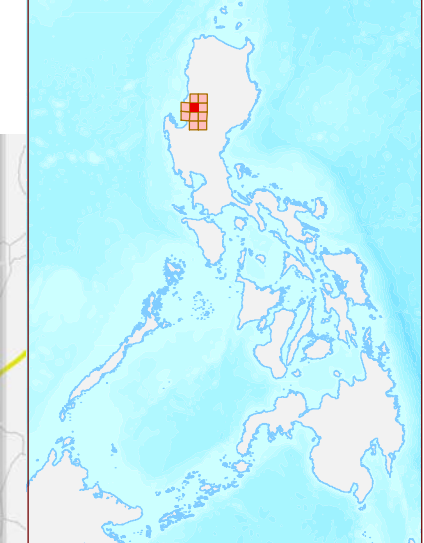
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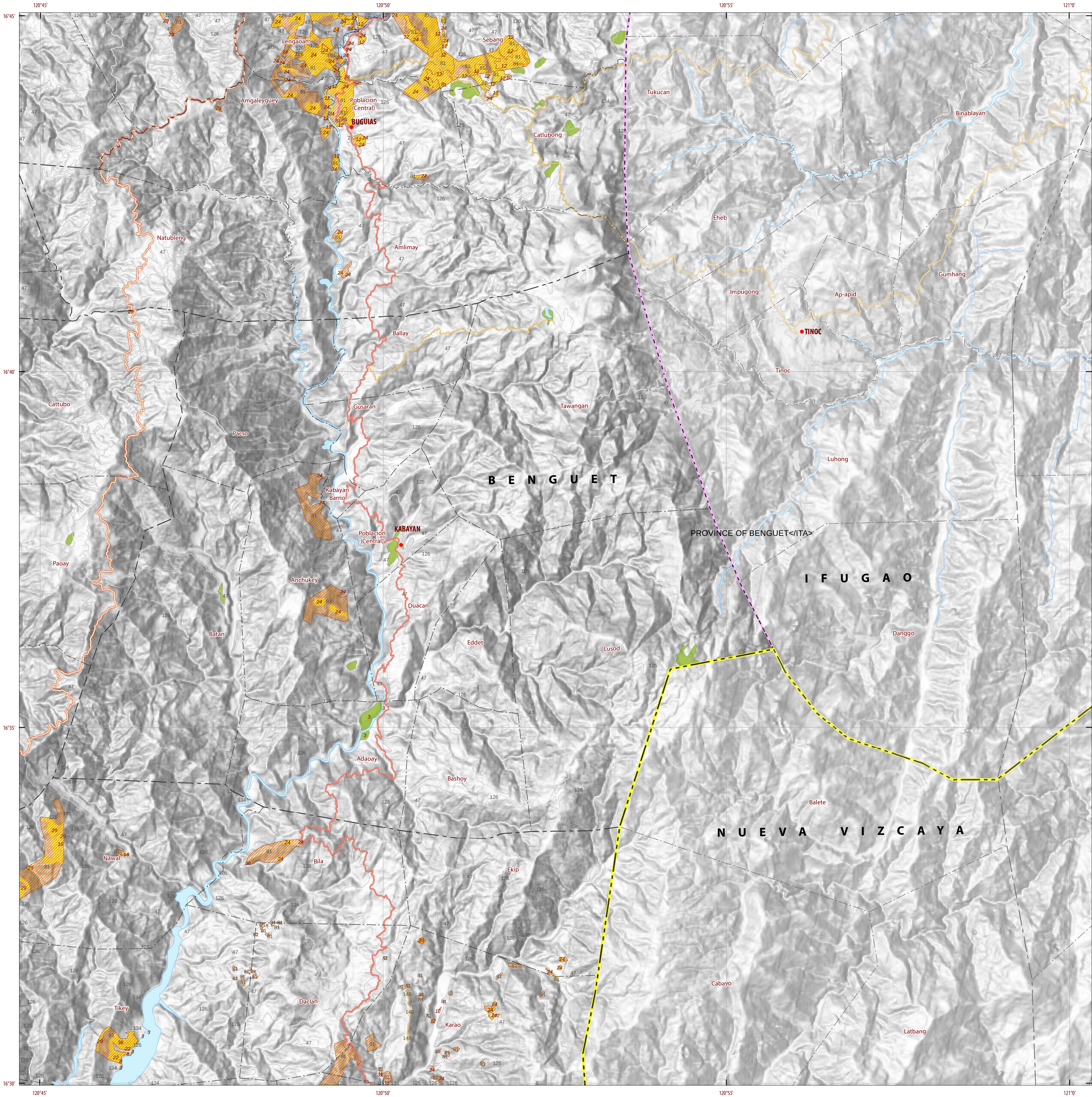
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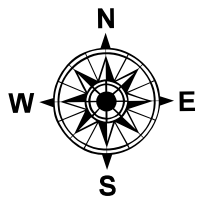
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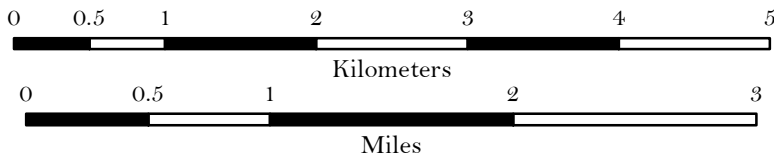


LAND SUITABILITY MAP ARABICA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS



SCALE 1 : 50 000



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

LEGEND

SUITABILITY CLASSES

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Not Suitable/ Not Relevant

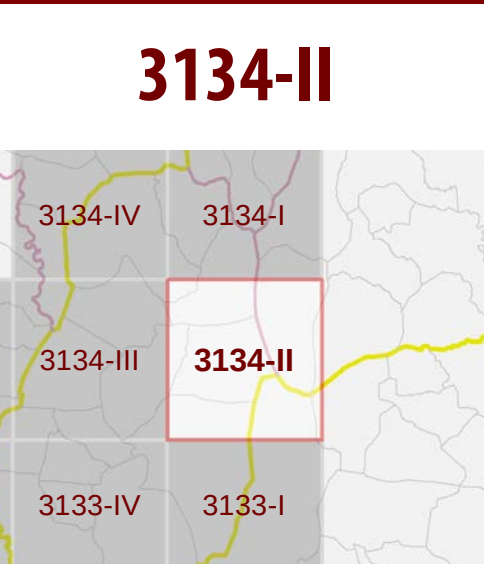
OTHER SIGNS

- NGP Areas
- Coffee
- Land limitation
- Land use

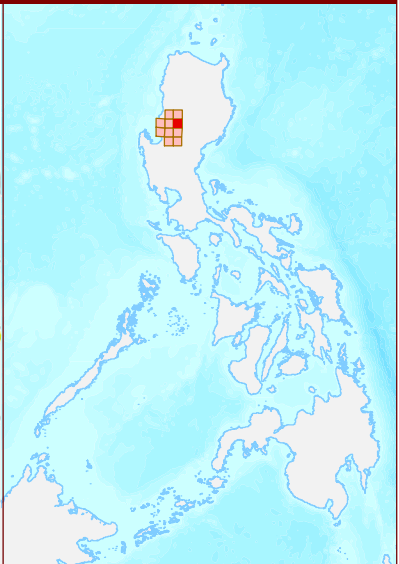
CONVENTIONAL SIGNS

- ROADS**
 - Expressway
 - Trunk line
 - Primary
 - Secondary
 - Tertiary
- BOUNDARY**
 - Region
 - Province
 - District
 - Municipality
 - Barangay
- HYDROLOGY**
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 - Lakes / Rivers
- PLACES**
 - Capital City / City
 - Capital Town / Town
- LAND USE**
 - Built-up
 - Fishpond
 - Mangrove

ADJOINING SHEETS



INDEX MAP



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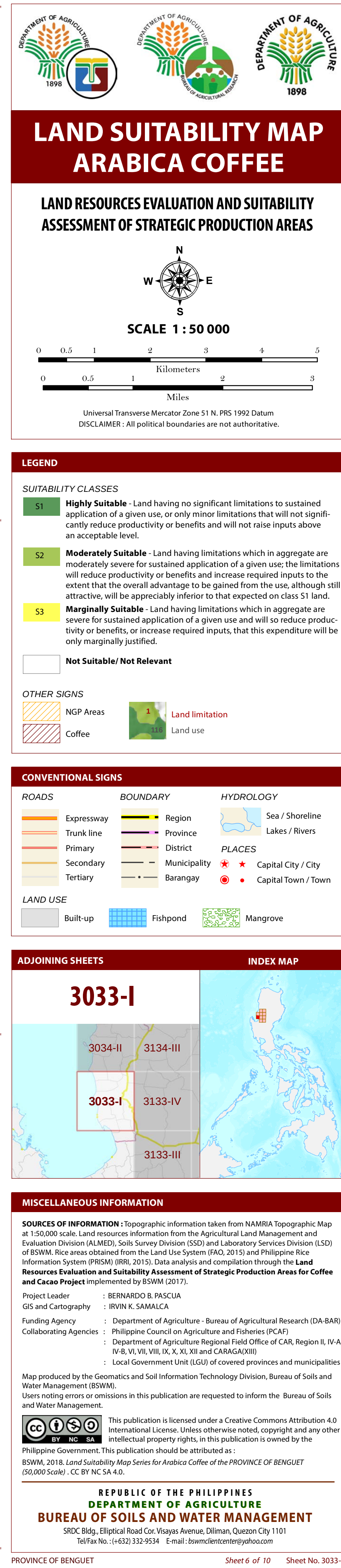
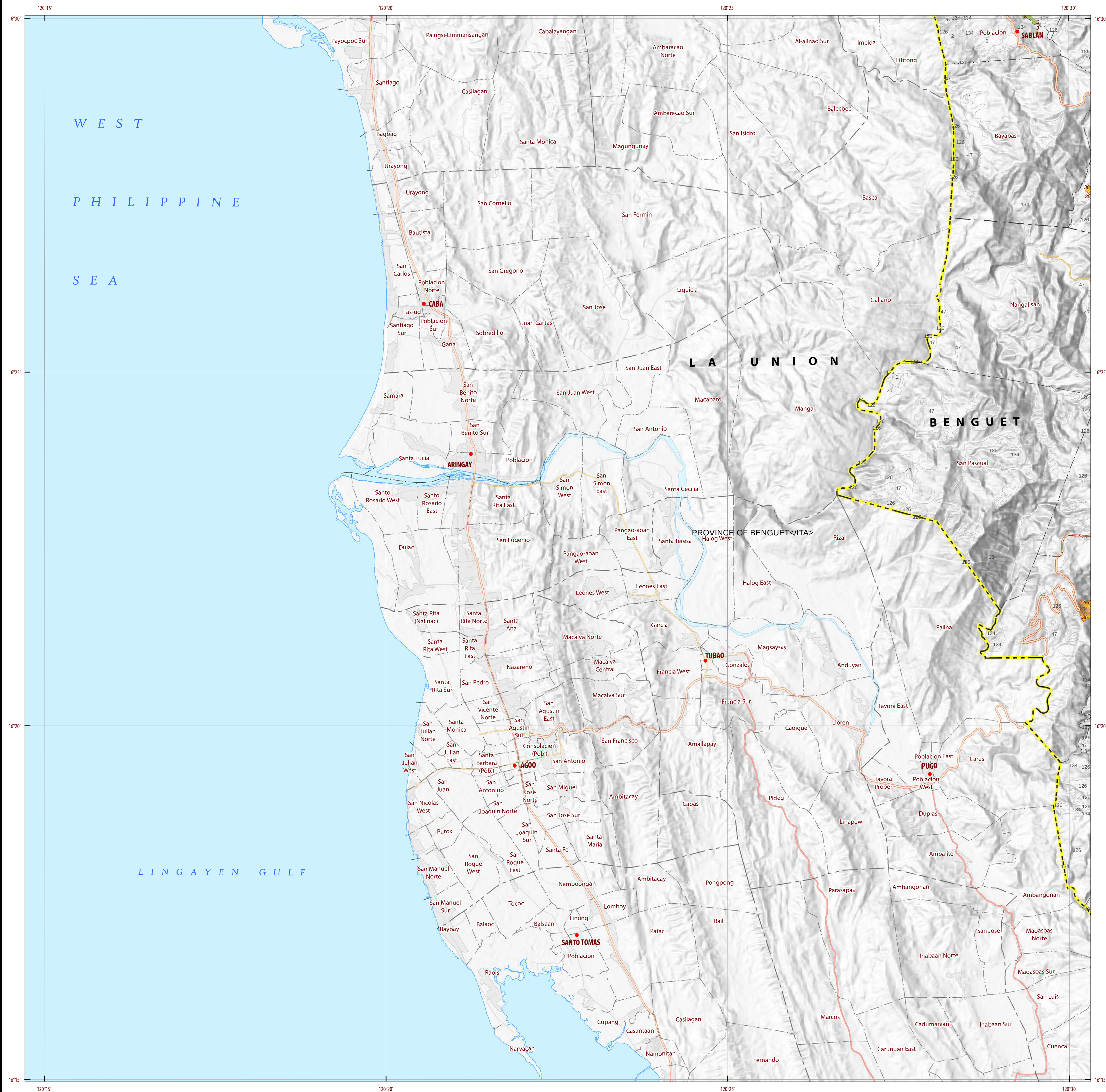
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GIS and Cartography : IRVIN K. SAMALCA

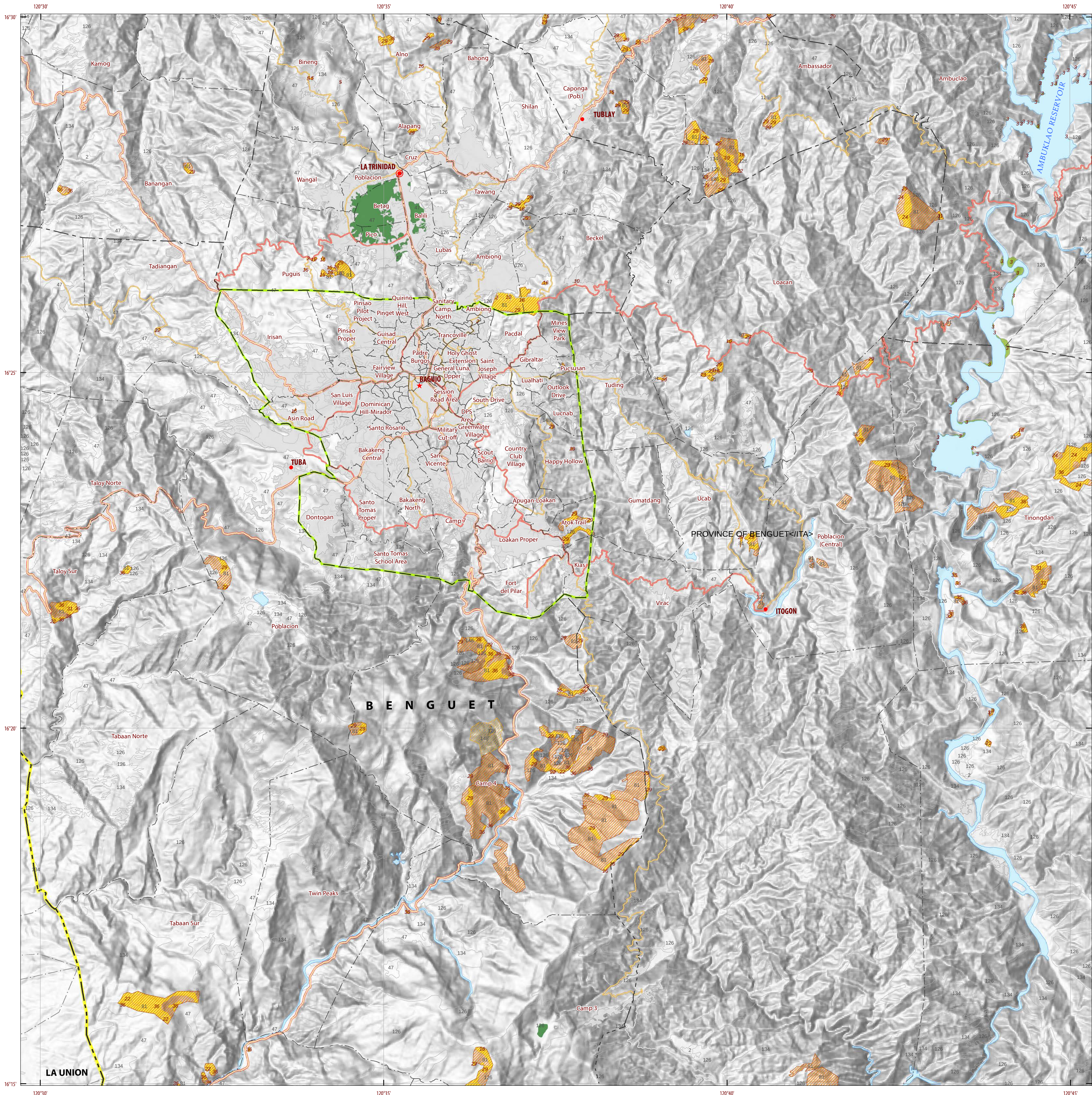
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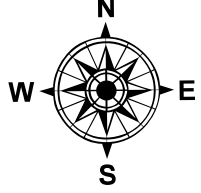
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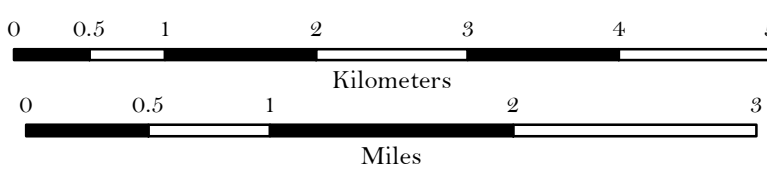


LAND SUITABILITY MAP ARABICA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS



SCALE 1 : 50 000



Universal Transverse Mercator Zone 51 N, PRS 1992 Datum
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LEGEND

SUITABILITY CLASSES

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Not Suitable/ Not Relevant

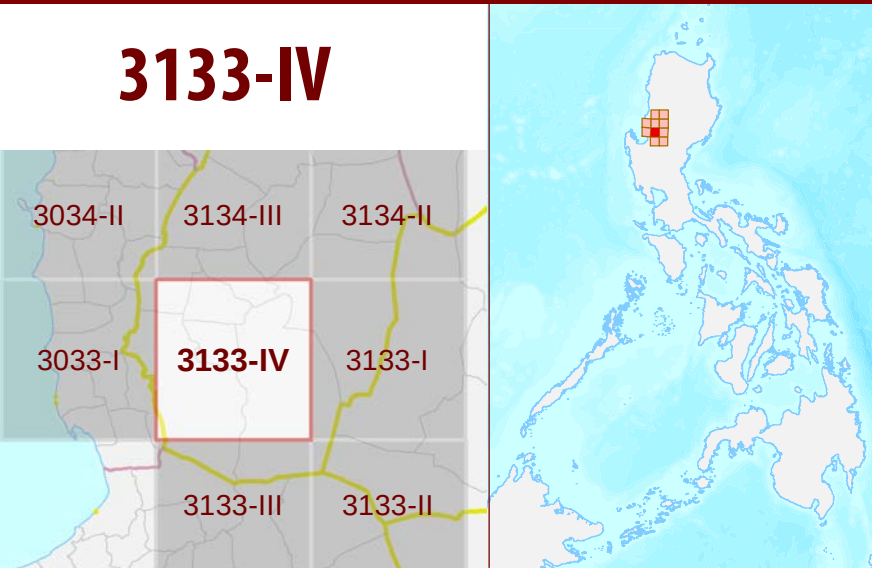
OTHER SIGNS

- NGP Areas
- Coffee
- Land limitation
- Land use

CONVENTIONAL SIGNS

- ROADS**
 - Expressway
 - Trunk line
 - Primary
 - Secondary
 - Tertiary
- BOUNDARY**
 - Region
 - Province
 - District
 - Municipality
 - Barangay
- HYDROLOGY**
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 - Capital Town / Town
- LAND USE**
 - Built-up
 - Fishpond
 - Mangrove

ADJOINING SHEETS



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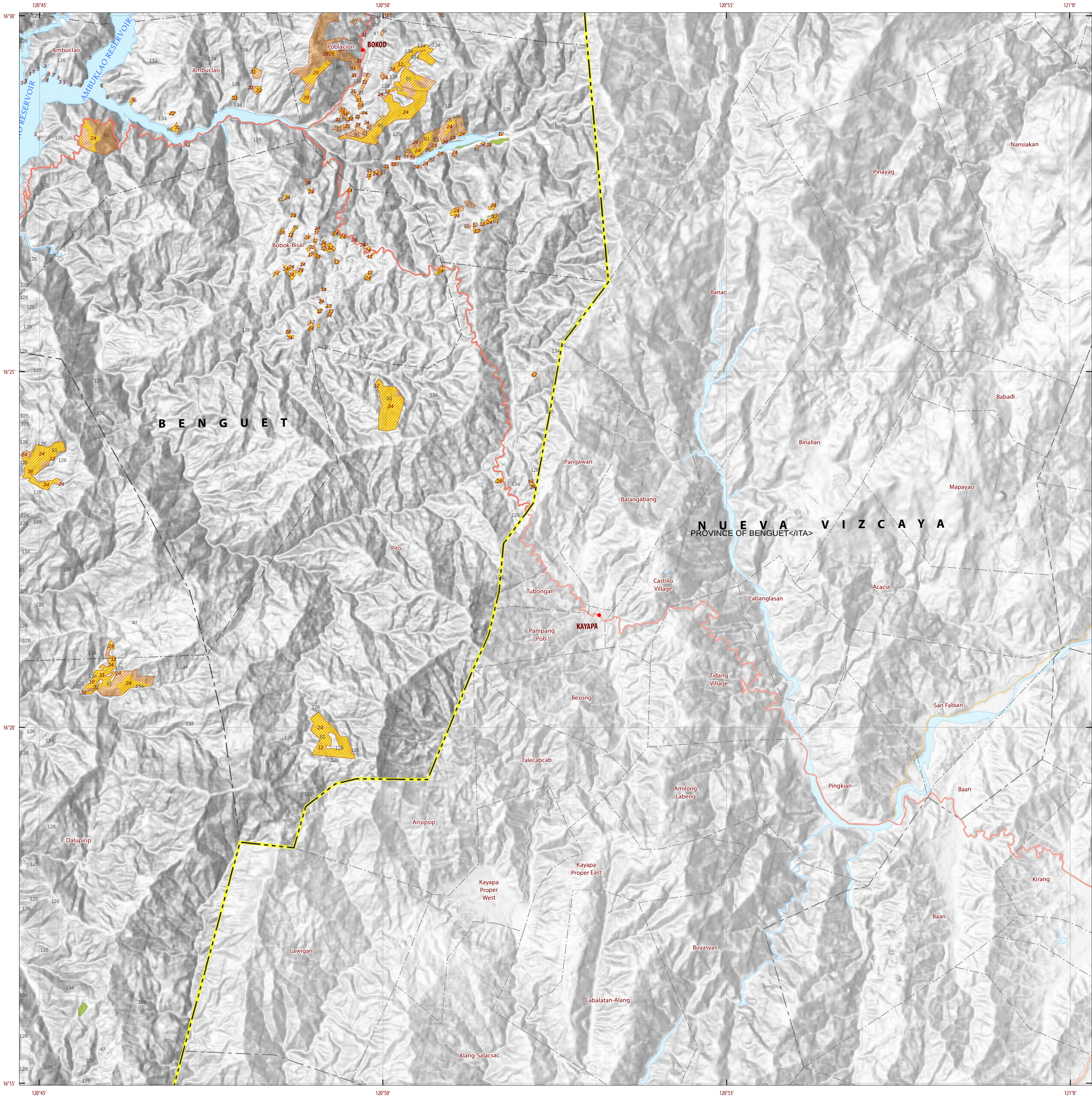
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GIS and Cartography : IRVIN K. SAMALCA

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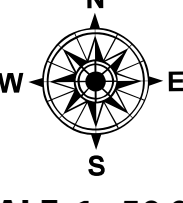
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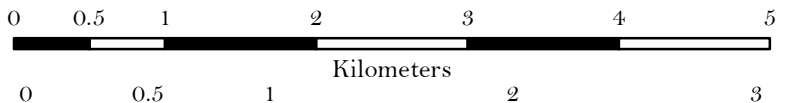


LAND SUITABILITY MAP
ARABICA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY
ASSESSMENT OF STRATEGIC PRODUCTION AREAS



SCALE 1 : 50 000



Universal Transverse Mercator Zone 51 N, PRS 1992 Datum
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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.

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

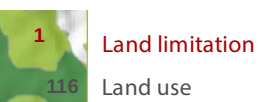
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Not Suitable/ Not Relevant

OTHER SIGNS

 NGP Areas

 Coffee

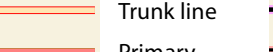
 Land limitation

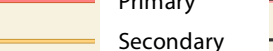
 Land use

CONVENTIONAL SIGNS

ROADS

 Expressway

 Trunk line

 Primary

 Secondary

 Tertiary

BOUNDARY

 Region

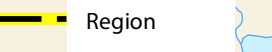
 Province

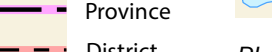
 District

 Municipality

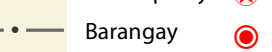
 Barangay

HYDROLOGY

 Sea / Shoreline

 Lakes / Rivers

PLACES

 Capital City / City

 Capital Town / Town

LAND USE

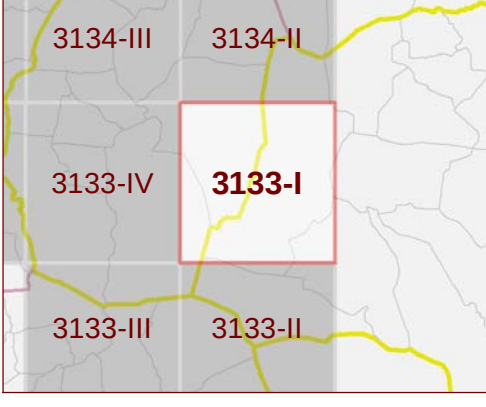
 Built-up

 Fishpond

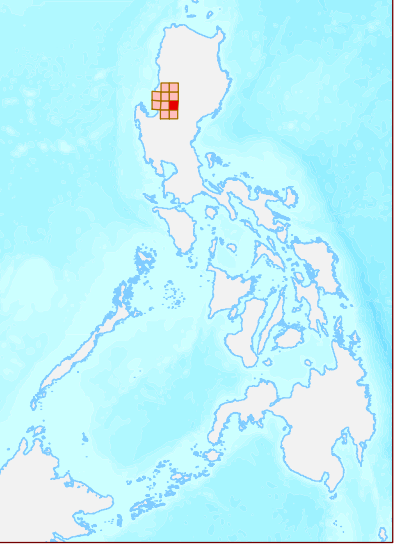
 Mangrove

ADJOINING SHEETS

3133-I



INDEX MAP



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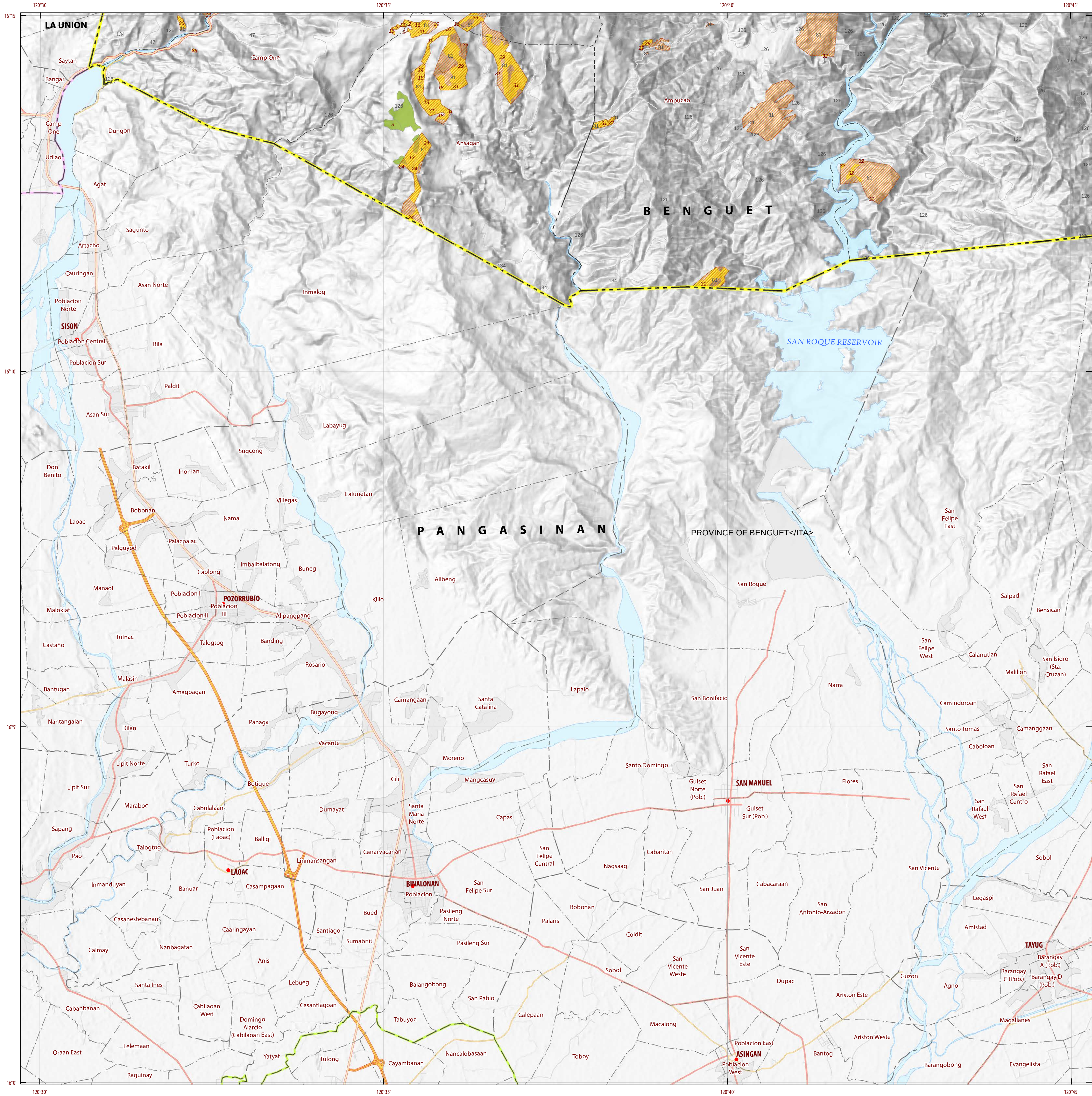
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PROVINCE OF BENGUET

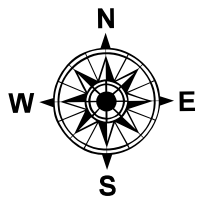
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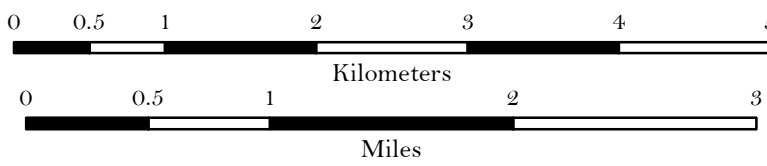


LAND SUITABILITY MAP ARABICA COFFEE

LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS



SCALE 1 : 50 000



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LEGEND

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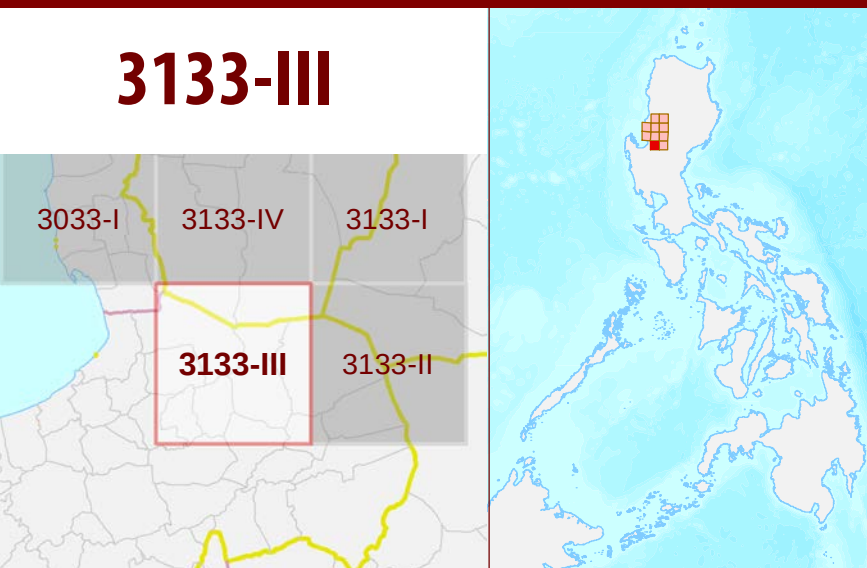
OTHER SIGNS

- NGP Areas
- Coffee
- 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



MISCELLANEOUS INFORMATION

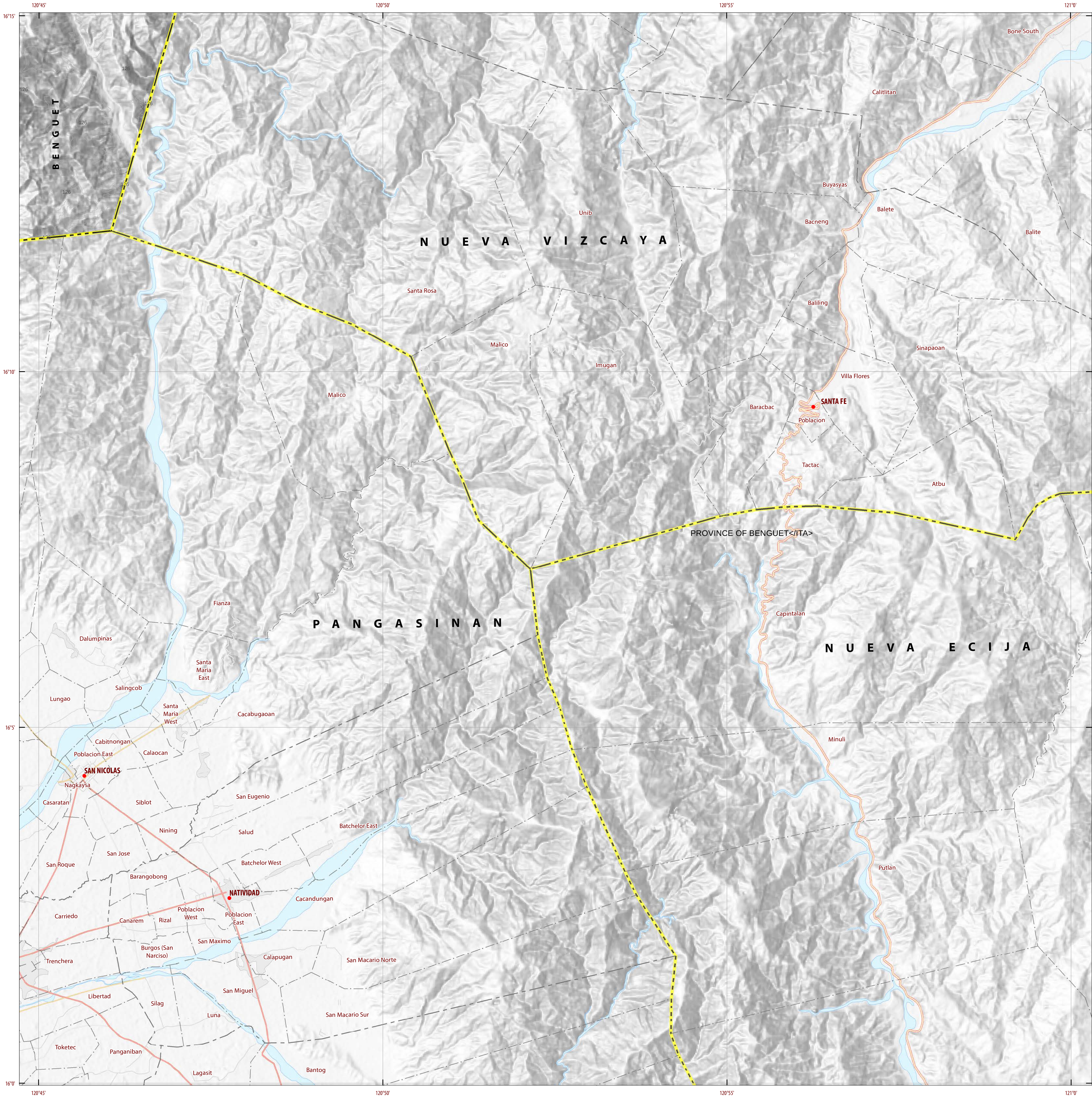
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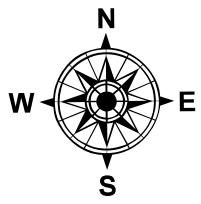
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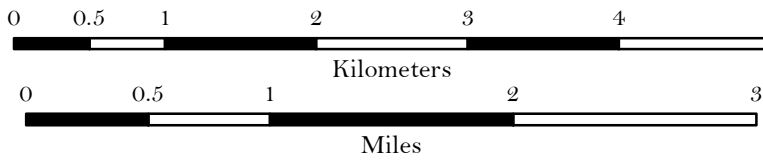


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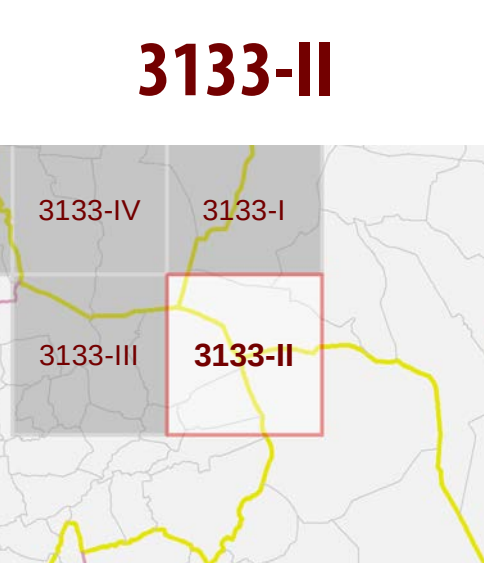
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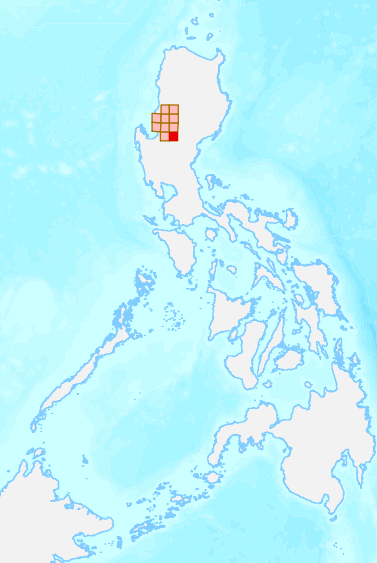
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