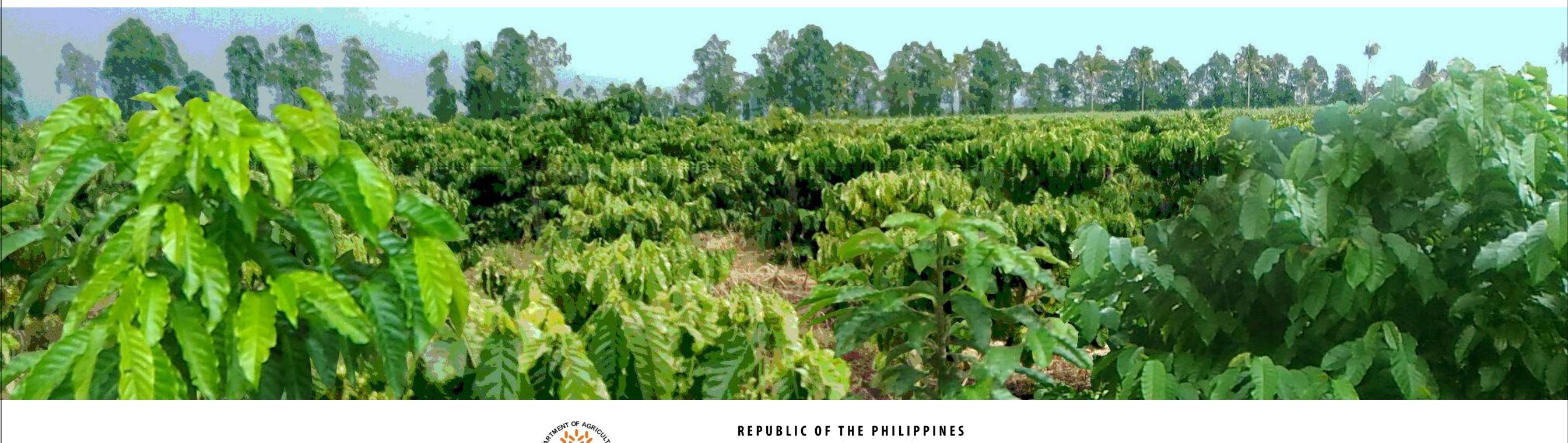
# **ROBUSTA, LIBERICA AND EXCELSA COFFEE**

## LAND RESOURCES EVALUATION AND SUITABILITY **ASSESSMENT OF STRATEGIC PRODUCTION AREAS**

# **PROVINCE OF SURIGAO DEL NORTE**

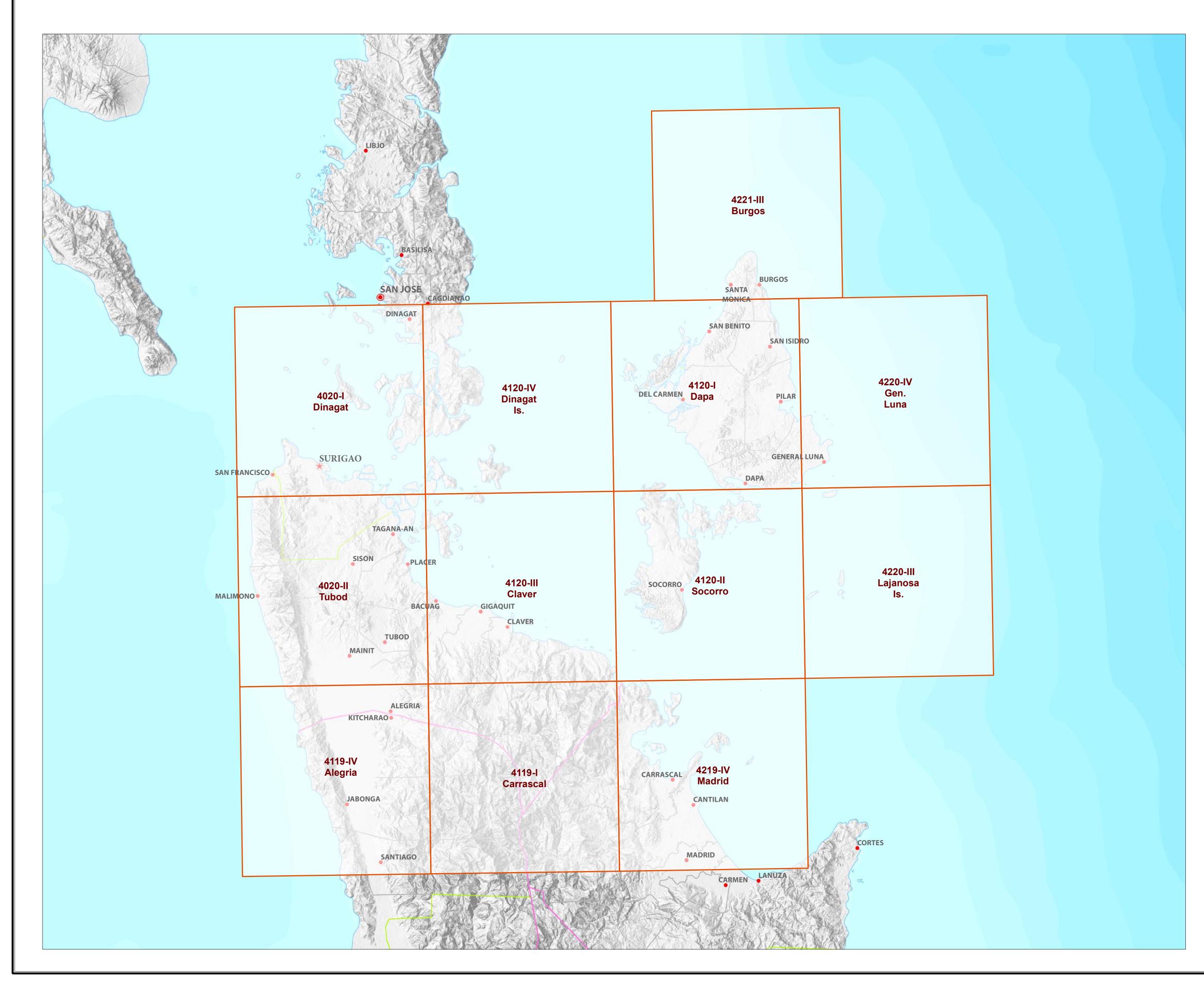




# LAND SUITABILITY MAP

DEPARTMENT OF AGRICULTURE **BUREAU OF SOILS AND WATER MANAGEMENT** SRDC Bldg., Elliptical Road Cor. Visayas Avenue, Diliman, Quezon City 1101 Tel/Fax No.: (+632) 332-9534 E-mail: bswmclientcenter@yahoo.com

## LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS **PROVINCE OF SURIGAO DEL NORTE**



## **MAP INDEX**

LEGEN	D
Places	
*	Capital City
*	City
۲	Capital Town
•	Town
Adminis	trative Boundary
	Regional
	Provincial
	City
	Municipal
Map Ind	lex
	Index grid
Topogra	phic Relief
Bathym	etry
LOCAT	ΙΟΝ ΜΑΡ
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Tel/Fax No.: (+632) 332-9534 E-mail: bswmclientcenter@yahoo.com

# LAND SUITABILITY MAP FOR **ROBUSTA, LIBERICA AND EXCELSA COFFEE**

## LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS **SURIGAO DEL NORTE, REGION XIII**

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

						EXI	PANSION A	AREA (Ha	a)		(	CONFLIC	Г RESOLU	JTION AI	REA (Ha)		TOTAL
MUNICIPALITY	EXIST	ING COFF	EE (Ha)	TOTAL EXISTING AREA (Ha)	Coco	onut	Shrubl unmana		Grassl unmana		Cor	n	Paddy non-irr	-	Other	crops	POTENTIAL EXPANSION
	<b>S1</b>	S2	<b>S</b> 3		<b>S1</b>	<b>S2</b>	<b>S1</b>	<b>S2</b>	<b>S1</b>	<b>S</b> 2	<b>S1</b>	S2	<b>S1</b>	<b>S</b> 2	<b>S1</b>	S2	AREA (Ha)
ALEGRIA	1	- 1		1	1,321	56	24	4	6	-	382	-	-	-	-		- 1,793
BACUAG	-			-	1,350	2	71	-	381	-	528	7	-	-	-		- 2,339
BURGOS	-			-	861	-	190	-	-	-	207	-	-	-	-		- 1,258
CLAVER	-			-	711	539	70	152	193	1,333	247	210	-	-	-		- 3,455
DAPA	-			-	2,318	13	187	9	345	2	305	-	-	-	-		- 3,179
DEL CARMEN	-			-	4,196	54	906	1	248	-	1,434	-	-	-	-		- 6,839
GENERAL LUNA	-			-	1,341	-	710	95	-	-	1,302	4	-	-	-		- 3,453
GIGAQUIT	-			-	1,451	246	218	8	62	-	644	193	-	-	-	-	2,822
MAINIT	-			-	4,236	14	49	3	139	8	1,289	11	-	-	-		- 5,749
MALIMONO	-			-	764	135	-	12	80	123	49	6	-	-	-		- 1,169
PILAR	-			-	2,397	-	427	-	18	-	1,568	-	-	-	-		- 4,411
PLACER	-			-	1,677	903	19	-	214	15	232	32	-	-	-		- 3,092
SAN BENITO	-			-	1,150	-	517	5	10	-	88	-	-	-	-		- 1,770
SAN FRANCISCO	-			-	549	113	-	-	38	24	147	-	-	-	-		- 871
SAN ISIDRO	-			-	1,981	-	645	-	-	-	1,284	-	-	-	-		- 3,910
SANTA MONICA	-			-	1,715	5	68	-	4	-	375	5	-	-	-		- 2,173
SISON	-			-	3,048	408	-	62	191	20	546	67	-	-	-		- 4,340
SOCORRO	-			-	532	325	331	320	98	1,602	765	900	-	-	-		- 4,872
SURIGAO CITY	-			-	3,845	954	362	172	1,825	1,297	2,323	594	-	-	-		- 11,372
TAGANA-AN	-	-	-	-	1,467	391	5	2	29	3	130	25	-	-	-		- 2,053
TUBOD	-	-		-	1,214	32	47	-	21	-	264	53	-	-	-		- 1,630
TOTAL	1		-	1	38,125	4,193	4,847	844	3,901	4,428	14,108	2,107	-	-	-		- 72,551

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.

9 Sh2

10 Sh2-Rc2

**19** T2-El2-E3-Sh2-Rc2

20 T2-F2-D2

29 T3-El2-E3-Sh3-Rc2 39 Tc

30 T3-F2-D2

### AGRONOMIC REOLUREMENT OF ROBUSTA LIBERICA AND EXCELSA COFFEE PRODUCTION

LAND UTILIZATION TYPE	I SUITABILITY RATING	SLOPE (%)	SOIL DEPTH (cm)	SOIL TEXTURE	SOIL DRAINAGE	SOIL REACTION (pH)	INHERENT FERTILITY	FLOODIN CLASS	G EROSION CLASS	ROCK OUTCROPS	ELEVATION (masl)	ANNUAL RAINFALI (mm)	
Coffee	S1	<8	>100	CL, SiCL, SCL, SC, SiC, C, HC	WD,MWD	5.6 -7.2	high	none-slig	nt none-slight	none-few	<1000	2001-4500	0 I, III, IV
(Robusta, Excelsa,	S2	8 - 30	30 - 100	FSL, L, SiL	SPD,PD	5.1 - 5.5 7.3 - 7.8	medium	moderat	e moderate	common	1000-2000	1000-200	0 I, II
Liberica)	S3	>30	<30	S, LS, CSL, SL	VPD,ED	<5.0 -> 7.9	low	severe	severe	many	>2000	<1000 >4500	
SLOPE (%)		•	SOIL DRAIN	AGE		SOIL REACTIO	N (pH)		SOIL TEX	<b>FURE</b>			
	vel to gently slopin	g	ED -	excessively drained			remely acid		Coarse			Fine	
	ently sloping to und	•	WD -	well drained			y strongly acid		S	- sand		SC	- sandy clay
	ndulating to rolling		MWD -	moderately well draine	ed	5.1 - 5.5 - stro	ongly acid		LS	- loamy sand		SiC	- silty clay
	olling to moderately		SPD -	somewhat poorly drain	ned	5.6 - 6.0 - me	dium acid		CSL	- coarse sandy loan	ı		- clay
30 - 50 - ste	•	1		poorly drained			htly acid		SL	- sandy loam			- heavy clay
	ery steep			very poorly drained		6.6 - 7.2 - neu	-		Medium				
	lig steep			tery poorty en annou			dly alkaline		FSL	- fine sandy loam			
SOIL DEPTH (	(cm)		SURFACE IM	IDEDIMENT			derately alkaline		L	- loam			
							-						
	ery shallow		ROCK OUTCH			> 8.5 - stre	ongly alkaline		SiL	- silt loam			
	hallow			none - few					CL	- clay loam			
	oderately deep eep to very deep			common many					SiCL SCL	- silty clay loam - sandy clay loam			
LAND LI	MITATION	S DESCRI	PTION AN	<b>ID COMBINA</b>	TIONS								
LAND LI	MITATION	S DESCRI	PTION AN soil draii		TIONS	S	OIL DEPTH			SOIL EROSION	N		
LEVATION		S DESCRI	SOIL DRAI					moderately	deep (30 - 100cm)		N ate erosion		
<b>LEVATION</b> 12 - 1000m	- 2000m	S DESCRI	<b>SOIL DRAI</b> D2 - Som	NAGE	to poorly draine	d Sl	h2 - Shallow to	o moderately pw (< 30cm)	deep (30 - 100cm)	E2 - Moder			
<b>ELEVATION</b> El2 - 1000m	- 2000m m	S DESCRI	<b>SOIL DRAI</b> D2 - Som	<b>NAGE</b> newhat poorly drained y poorly drained or exc	to poorly draine	d Si Si	h2 - Shallow to	ow (< 30cm)	deep (30 - 100cm)	E2 - Moder	ate erosion		
<b>ELEVATION</b> 212 - 1000m 213 - > 2000r ELOPE/TOPOC	- 2000m m		SOIL DRAIN D2 - Som D3 - Ver SOIL TEXT	<b>NAGE</b> newhat poorly drained y poorly drained or exc	to poorly draine	d Si Si	h2 - Shallow to h3 - Very shallo	ow (< 30cm)	deep (30 - 100cm)	E2 - Moder E3 - Severe FLOODING	ate erosion	ling	
<b>LEVATION</b> 12 - 1000m 13 - > 2000r <b>LOPE/TOPOC</b> 2 - Undulat	- 2000m m <b>GRAPHY</b>		SOIL DRAIN D2 - Som D3 - Ver SOIL TEXT	NAGE newhat poorly drained y poorly drained or exc URE	to poorly draine	d Si Si R R	h2 - Shallow to h3 - Very shallo	ow (< 30cm)	deep (30 - 100cm)	E2 - Moder E3 - Severe <b>FLOODING</b> F2 - Moder	ate erosion erosion	0	
<b>LEVATION</b> 12 - 1000m 13 - > 2000r <b>LOPE/TOPOC</b> 2 - Undulat 3 - Steep to	- 2000m m <b>GRAPHY</b> iting to moderately o very steep	steep	SOIL DRAIN D2 - Som D3 - Ver SOIL TEXT Tc - Coa	NAGE newhat poorly drained y poorly drained or exc URE	to poorly draine cessively drained	d SI SI R R R	n2 - Shallow to n3 - Very shallo COCK OUTCROPS c2 - Common c3 - Many	ow (< 30cm)	deep (30 - 100cm) LANDUSE	E2 - Moder E3 - Severe <b>FLOODING</b> F2 - Moder	ate erosion erosion ate seasonal flood	0	
<b>LEVATION</b> 12 - 1000m 13 - > 2000r <b>LOPE/TOPOC</b> 12 - Undulat 13 - Steep to	- 2000m m <b>GRAPHY</b> iting to moderately o very steep	steep	SOIL DRAIN D2 - Som D3 - Ver SOIL TEXT Tc - Coa	NAGE newhat poorly drained y poorly drained or exc URE rse texture	to poorly draine cessively drained	d SI SI R R R	n2 - Shallow to n3 - Very shallo COCK OUTCROPS c2 - Common c3 - Many	ow (< 30cm)	LANDUSE	E2 - Moder E3 - Severe <b>FLOODING</b> F2 - Moder	ate erosion erosion ate seasonal flood	0	
<b>ELEVATION</b> 12       - 1000m         13       - > 2000r         ELOPE/TOPOO         2       - Undulat         '3       - Steep to         CODE       LI	- 2000m m GRAPHY iting to moderately o very steep IMITATION	steep CODE LIM	SOIL DRAIN D2 - Som D3 - Ver SOIL TEXT Tc - Coa	NAGE newhat poorly drained y poorly drained or exe URE rse texture CODE LIMITAT	to poorly draine cessively drained ION CODE	d SI SI R R R E LIMITATIO	n2 - Shallow to n3 - Very shallo COCK OUTCROPS c2 - Common c3 - Many	ow (< 30cm) 5 CODE	<b>LANDUSE</b> n	E2 - Moder E3 - Severe <b>FLOODING</b> F2 - Moder	ate erosion erosion ate seasonal flood	0	
ELEVATION         12       - 1000m         13       - > 2000r         LOPE/TOPOC         2       - Undulat         3       - Steep to         CODE       LI         1       E2	- 2000m m GRAPHY Iting to moderately o very steep IMITATION	steep CODE LIM 11 T2	SOIL DRAIN D2 - Som D3 - Ver SOIL TEXT Tc - Coa	NAGE         newhat poorly drained         y poorly drained or exc         URE         rse texture         CODE       LIMITAT         21       T2-F3-D2	to poorly drained cessively drained ION CODE 31	d SI SI R R R R R T3-F3-D2	n2 - Shallow to n3 - Very shallo COCK OUTCROPS c2 - Common c3 - Many	code 4 Cor	LANDUSE n fee	E2 - Moder E3 - Severe <b>FLOODING</b> F2 - Moder	ate erosion erosion ate seasonal flood	0	
ELEVATION $12$ - 1000m $13$ - > 2000r $13$ - > 2000r $2$ - Undulation $2$ - Undulation $3$ - Steep to $3$ - Steep to $1$ E2 $2$ E2-Sh2	- 2000m m GRAPHY Iting to moderately o very steep IMITATION 2-Rc2 3	steep         CODE       LIM         11       T2         12       T2-E3	SOIL DRAIN D2 - Som D3 - Very SOIL TEXT Tc - Coa	NAGEnewhat poorly drainedy poorly drained or excURErse textureCODELIMITAT21T2-F3-D222T3	to poorly drained cessively drained ION CODE 31 32	d SI SI R R R R R T3-F3-D2 T3	n2 - Shallow to n3 - Very shallo COCK OUTCROPS c2 - Common c3 - Many	code       CODE       4       Con       81     Con       82     Cac	LANDUSE n fee	E2 - Moder E3 - Severe <b>FLOODING</b> F2 - Moder	ate erosion erosion ate seasonal flood	0	
LEVATION         12       - 1000m         13       - > 2000r         LOPE/TOPOC         2       - Undulat         3       - Steep to         CODE       LI         1       E2         2       E2-Sh2         3       E3-Rc3	GRAPHY ating to moderately o very steep IMITATION 2-Rc2 3 3-Rc3	steep         CODE       LIM         11       T2         12       T2-E3         13       T2-E3-F	SOIL DRAIN D2 - Som D3 - Very SOIL TEXT Tc - Coa	NAGEnewhat poorly drainedy poorly drained or exeURErse textureCODELIMITAT21T2-F3-D222T323T3-E3	to poorly drained cessively drained ION CODE 31 32 33 34	d Sl Sl R R R R T3-F3-D2 T3-E3	n2 - Shallow to n3 - Very shall COCK OUTCROPS c2 - Common c3 - Many	cone         4         81         Cof         82         Car         116	LANDUSE n fee ao	E2 - Moder E3 - Severe <b>FLOODING</b> F2 - Moder	ate erosion erosion ate seasonal flood	0	
LEVATION $12$ 1000m $13$ -> 2000r         LOPE/TOPOC         2       - Undulat         3       - Steep to         CODE       LI         1       E2         2       E2-Sh2         3       E3-Rc3         4       E12-E3	I - 2000m m GRAPHY Iting to moderately o very steep IMITATION 2-Rc2 3 3-Rc3 12-Rc2	steep         CODE       LIM         11       T2         12       T2-E3         13       T2-E3-F         14       T2-E3-F	SOIL DRAIN D2 - Som D3 - Ver SOIL TEXT Tc - Coa	NAGEnewhat poorly drainednewhat poorly drained or exeURErse textureCODELIMITAT21T2-F3-D222T323T3-E324T3-E3-Rc2	to poorly drained cessively drained ION CODE 31 32 33 34 3 35	d SI SI R R R R R T3-F3-D2 T3 T3-E3 T3-E3 T3-E3-Rc3	n2 - Shallow to n3 - Very shall COCK OUTCROPS c2 - Common c3 - Many	CODE     4       4     Corr       81     Corr       82     Carr       116     Corr       126     Grad	LANDUSE n fee ao onut	E2 - Moder E3 - Severe <b>FLOODING</b> F2 - Moder	ate erosion erosion ate seasonal flood	0	
ELEVATION $12$ 1000m $13$ -> 2000r         LOPE/TOPOC         2       - Undulat         3       - Steep to         CODE       LI         1       E2         2       E2-Sh2         3       E3-Rc3         4       E12-E3         5       E12-Sh         6       F2-D2	a - 2000m m GRAPHY Iting to moderately o very steep IMITATION 2-Rc2 3 3-Rc3 h2-Rc2	Steep         LIM         11       T2         12       T2-E3-F         13       T2-E3-F         14       T2-E3-F         15       T2-E3-S         16       T2-E3-S	SOIL DRAIN D2 - Som D3 - Very SOIL TEXT Tc - Coa	NAGEnewhat poorly drainedy poorly drained or exeURErse textureCODELIMITAT21T2-F3-D222T323T3-E324T3-E3-Rc225T3-E3-Sh2-Rc26T3-E3-Sh3-Rc	to poorly drained cessively drained ION CODE 31 32 33 34 3 35 2 36	<ul> <li>d SI</li> <li>SI</li> <li>SI</li> <li>SI</li> <li>R</li> <li>R&lt;</li></ul>	n2 - Shallow to n3 - Very shall COCK OUTCROPS c2 - Common c3 - Many	CODE     4       4     Corr       81     Corr       82     Carr       116     Corr       126     Grad	LANDUSE n fee ao onut ssland	E2 - Moder E3 - Severe <b>FLOODING</b> F2 - Moder	ate erosion erosion ate seasonal flood	0	
LEVATION $12$ 1000m $13$ -> 2000r $13$ -> 2000r         LOPE/TOPOC         2       - Undulat         3       - Steep to         CODE       LI         1       E2         2       E2-Sh2         3       E3-Rc3         4       E12-E3         5       E12-Sh         6       F2-D2	a - 2000m m GRAPHY ating to moderately o very steep IMITATION 2-Rc2 3 3-Rc3 a2-Rc2	Steep         CODE       LIM         11       T2         12       T2-E3-F         13       T2-E3-F         14       T2-E3-F         15       T2-E3-S         16       T2-E3-S	SOIL DRAIN D2 - Som D3 - Very SOIL TEXT Tc - Coa	NAGEnewhat poorly drainedy poorly drained or excURErse textureCODELIMITAT21T2-F3-D222T323T3-E324T3-E3-Rc225T3-E3-Sh2-Rc2	to poorly drained cessively drained ION CODE 31 32 33 34 34 3 35 2 36 3 37	d SI SI SI R R R R T3-F3-D2 T3 T3-E3 T3-E3 T3-E3-Rc3 T3-E3-Sh3-Rc3 T3-E12-E3-Sh3-	n2 - Shallow to n3 - Very shall COCK OUTCROPS c2 - Common c3 - Many	CODE     4       4     Corr       81     Corr       82     Carr       116     Corr       126     Grad	LANDUSE n fee ao onut ssland	E2 - Moder E3 - Severe <b>FLOODING</b> F2 - Moder	ate erosion erosion ate seasonal flood	0	

SUITABILITY	CLASSES
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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.

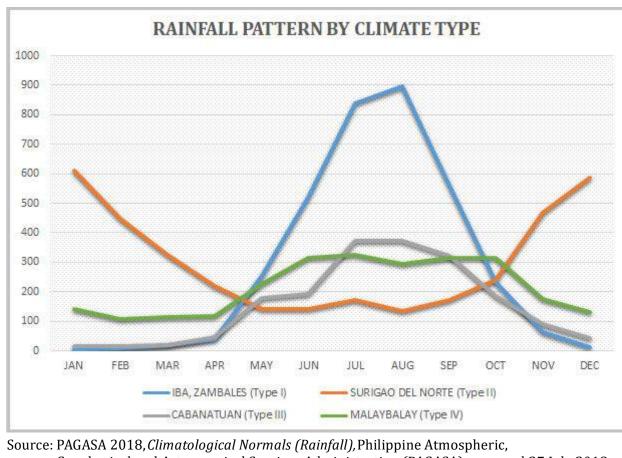
### Moderately Suitable (S2)

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.

**CLIMATE TYPE** 

- **TYPE I** : Two pronouced season, dry from November to April and **TYPE II** : No dry season with a very pronounced maximum rain wet during the rest of the year. Maximum rain period is from June to September
- **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.

Surigao Del Norte is classified as climatic Type II



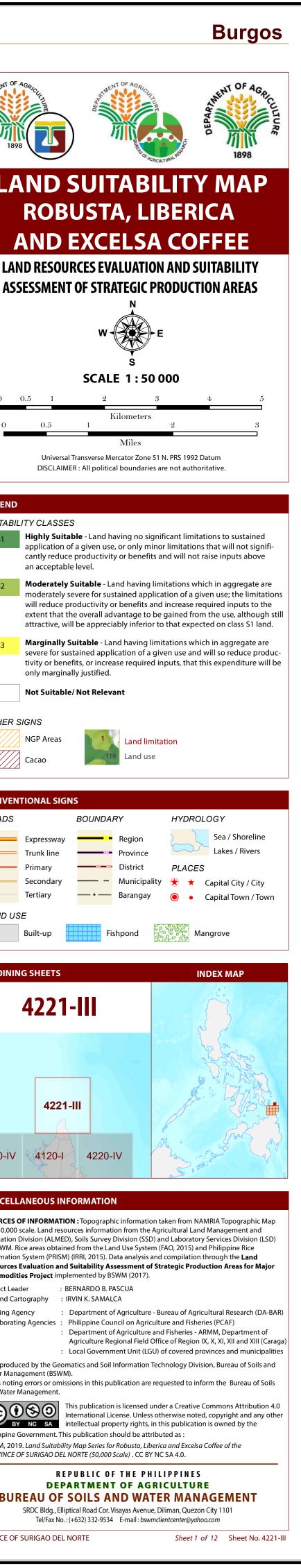
Geophysical and Astronomical Services Administration (PAGASA), accessed 27 July 2018, <a href="https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>">https://www1.pagasa.dost.gov.php/climate/climate/climatological-normals>">https://www1.pagasa.dost.gov.php/climate/climate/climate/climate/climate/climate/climate/climate/climate/climate/climate/climate/climate/climate/climate/climate/cl

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.

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.

- period from December to February. There is not a single dry month. Maximum monthly rainfall occurs during the period from March to May.
- **TYPE IV** : Rainfall is more or less evenly distributed throughout the year. This type resembles Type II since it has no dry season.

	<b>4221-III</b>	PROVINCE OF SURIGAO DEL NORTE	°10'
10°15			10°15'
			LA
			0
			LEGEND
10°10			10°10'
			S2
			OTHER
		PHILIPPINE SE	
			CONVEI ROADS
			LAND U
			ADJOINI
10°5'			
	DINAGAT SOUNE	Tangbo Alegria	4120-IV
		García	SOURCES at 1:50,000 Evaluation of BSWM. Informatic Resource: Commodi
		Rizal Bitaug DELNORTE	Project Le GIS and Ca Funding A Collaborat
		T. Arlan Mabuhay (Pob.) 2 (Pob.) SANTA MONICA 26 Poblacion 1 BURGOS	Map prod Water Mar Users noti and Water
		Poblacion 2 Matin-ao Bailan	Philippine BSWM, 20 PROVINCE
10°0	126		10°0'

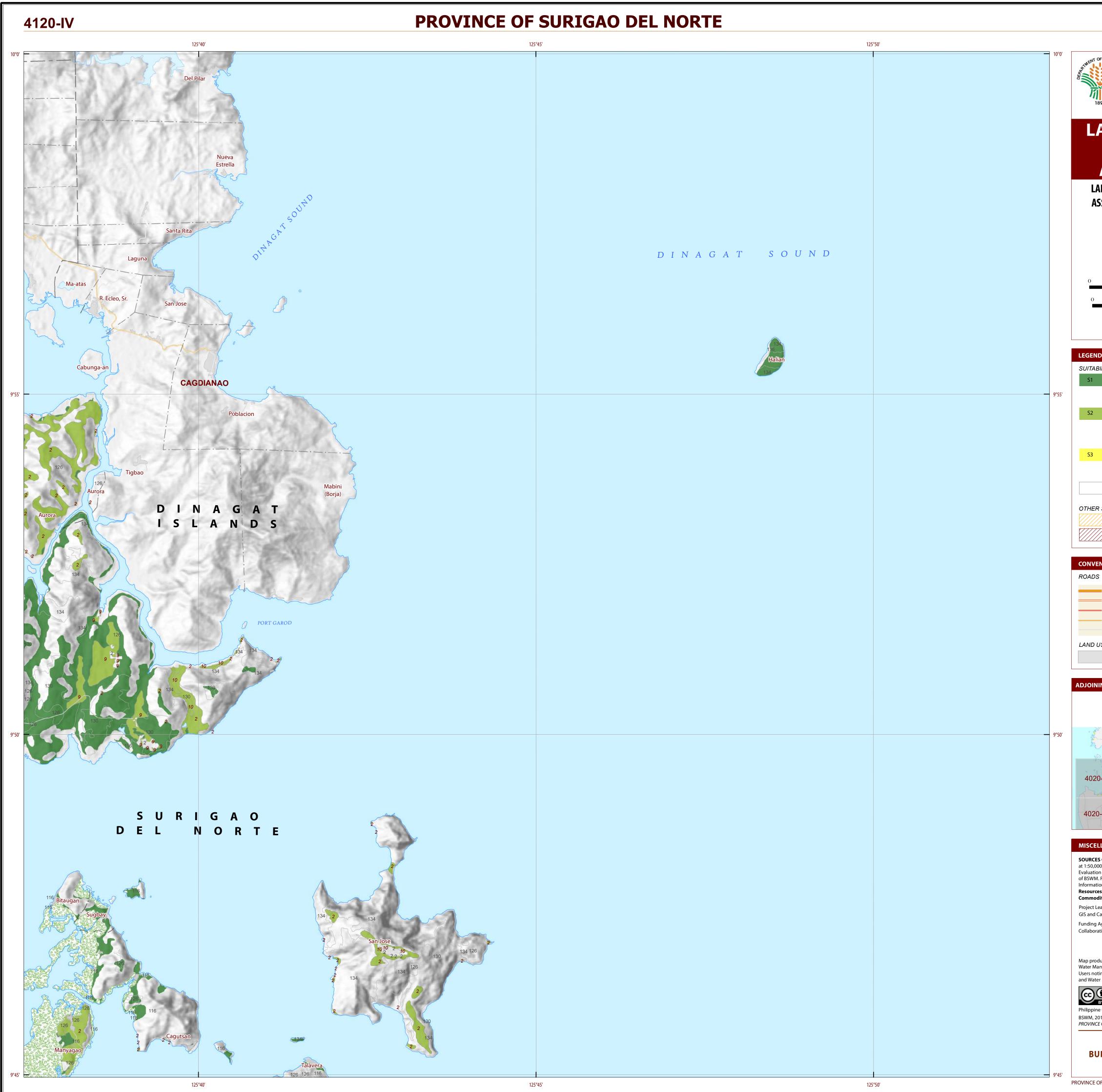


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9°50'		
		22116
		Punta Bilar Ho 2 126
		150 Mabua 150 150
		130 <sup>4</sup> 126 130 <sup>134</sup> 150
		130 Sabang 134 150
		150 150 150 150 150 150 150 150
	SAN	FRANCISCO 2 50 150 2 4 150 Washington (Pob.)
		Poblacion 116 2.4 2 2 150 4 50 150 150 150 150 150 150 150 150 150
	D	iaz 4 <sup>150</sup> 2 2 150 150 2 Canlanin 150 150 150 150 150 150 150 150 150 150
	2 4	50 4 4 4 4 150 Luna 9 4 150 Luna 150 150 150 150 150 150 150 150 150 150
	110 4 110 Banbanon	A         4         4         4         4         150         150         120           150 <t< td=""></t<>
	3 126 116	
	<sup>2</sup> Oslao 150 2 130	San Roque 4 2 150 150 150 150 150 150 150 150 150 150
9°45'	126 110	
	12:	5°25'

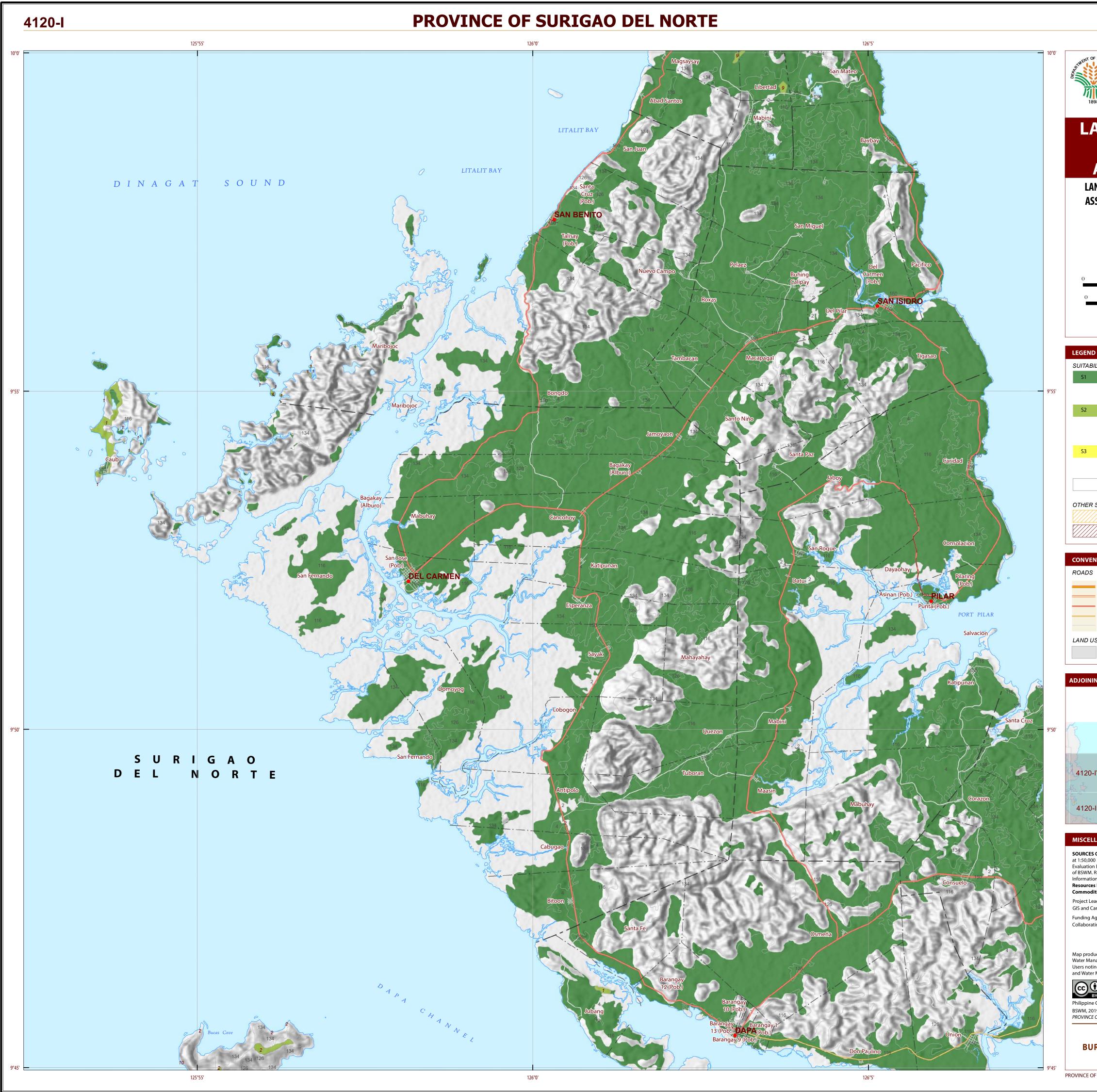
## **OF SURIGAO DEL NORTE**



	Dinagat
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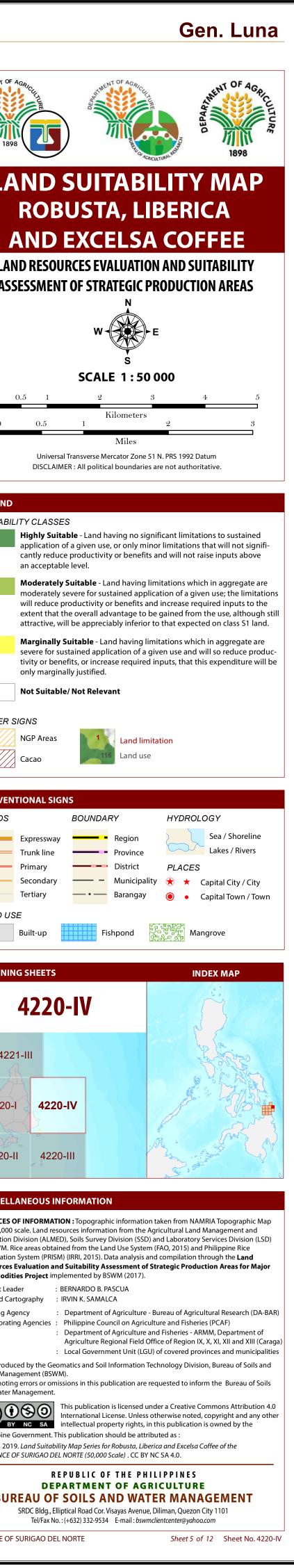
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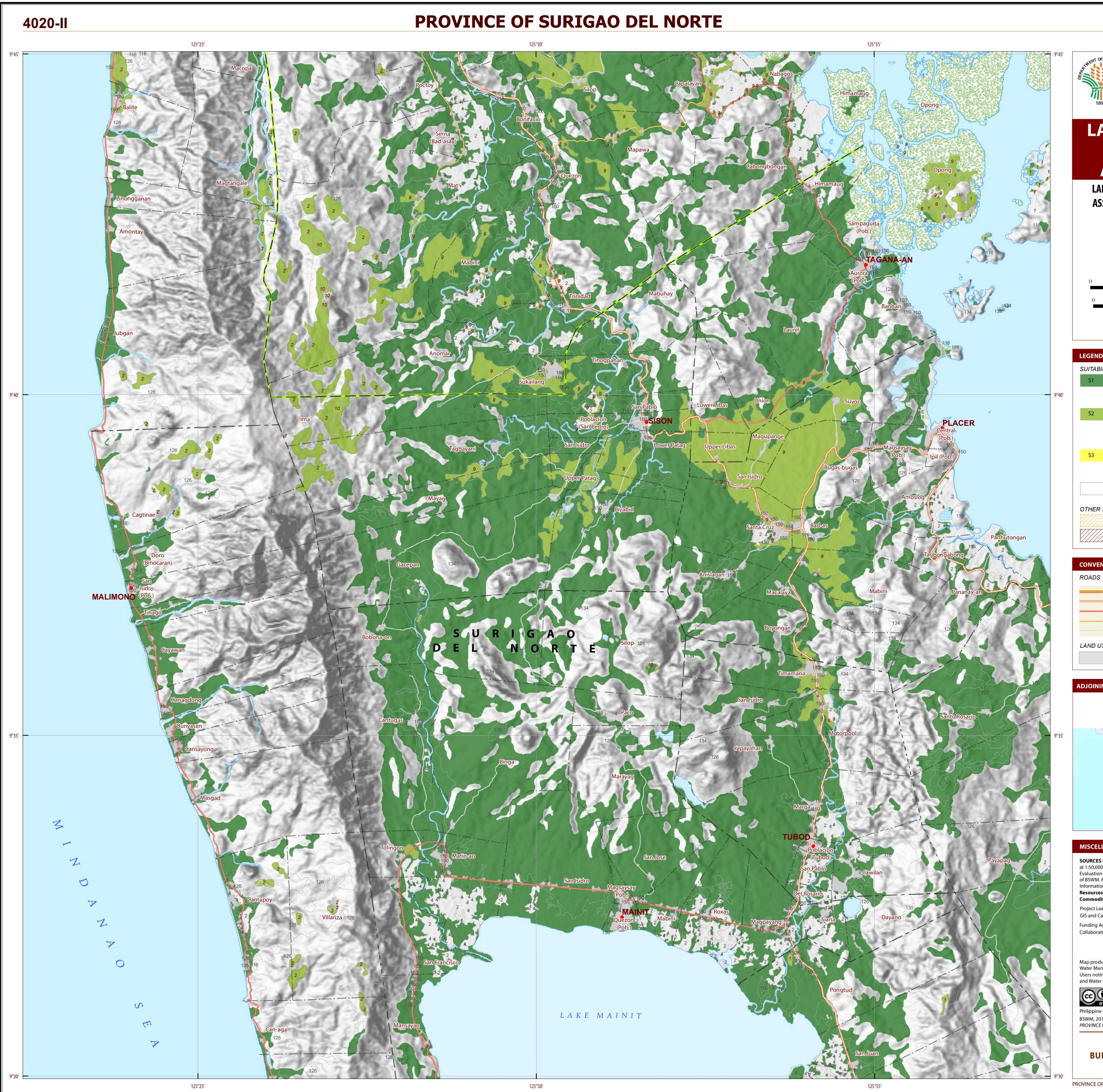


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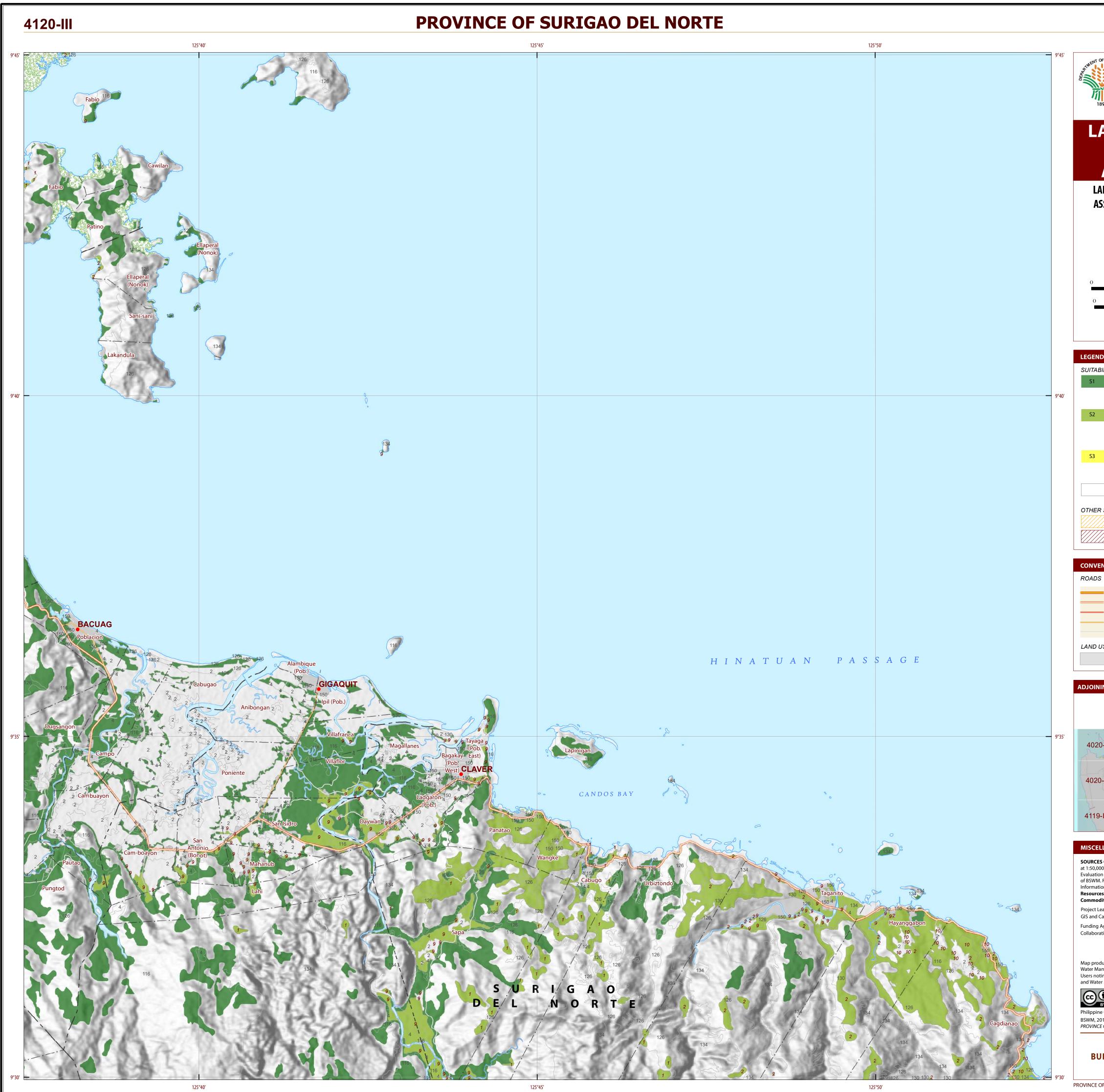
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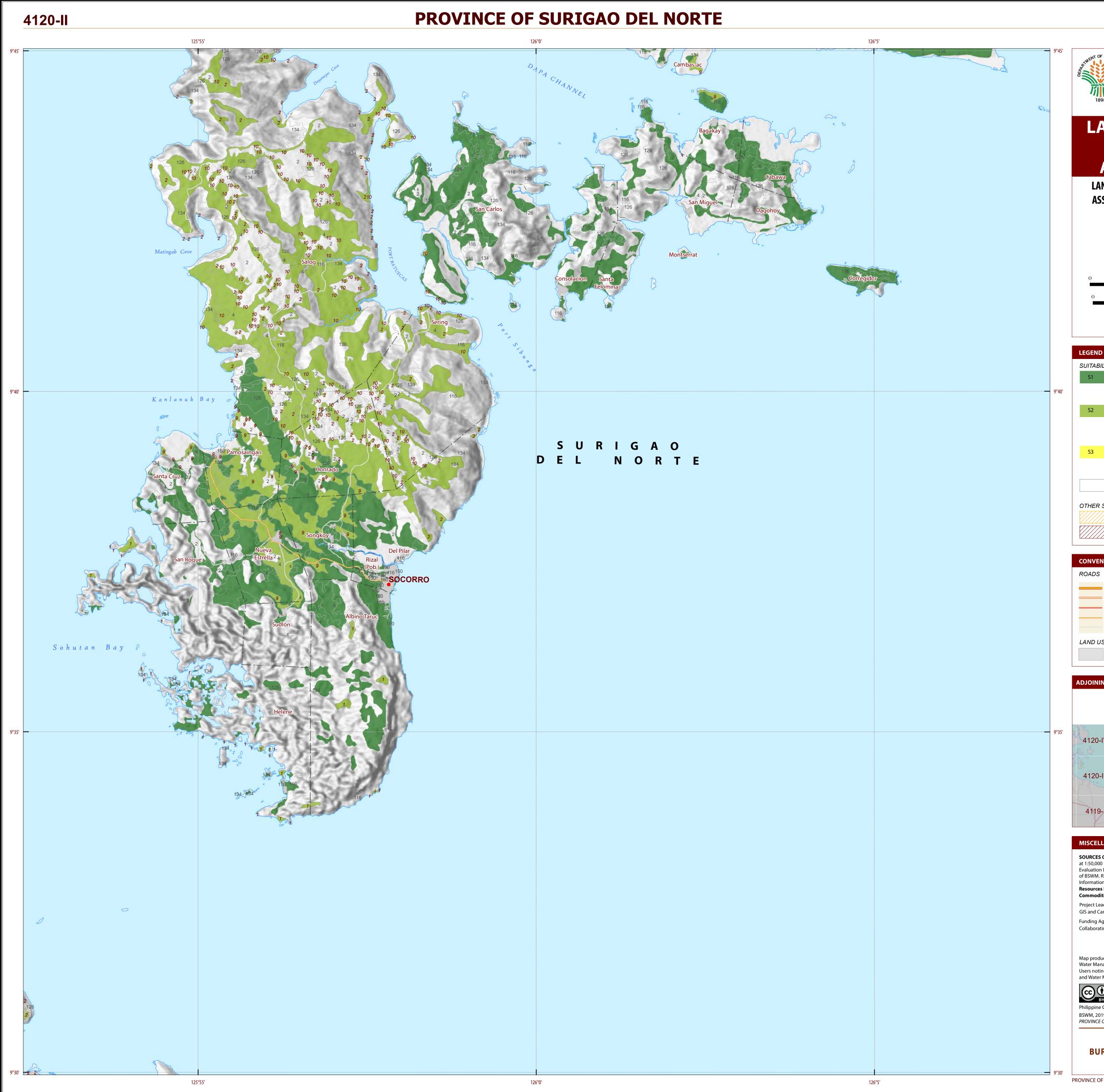




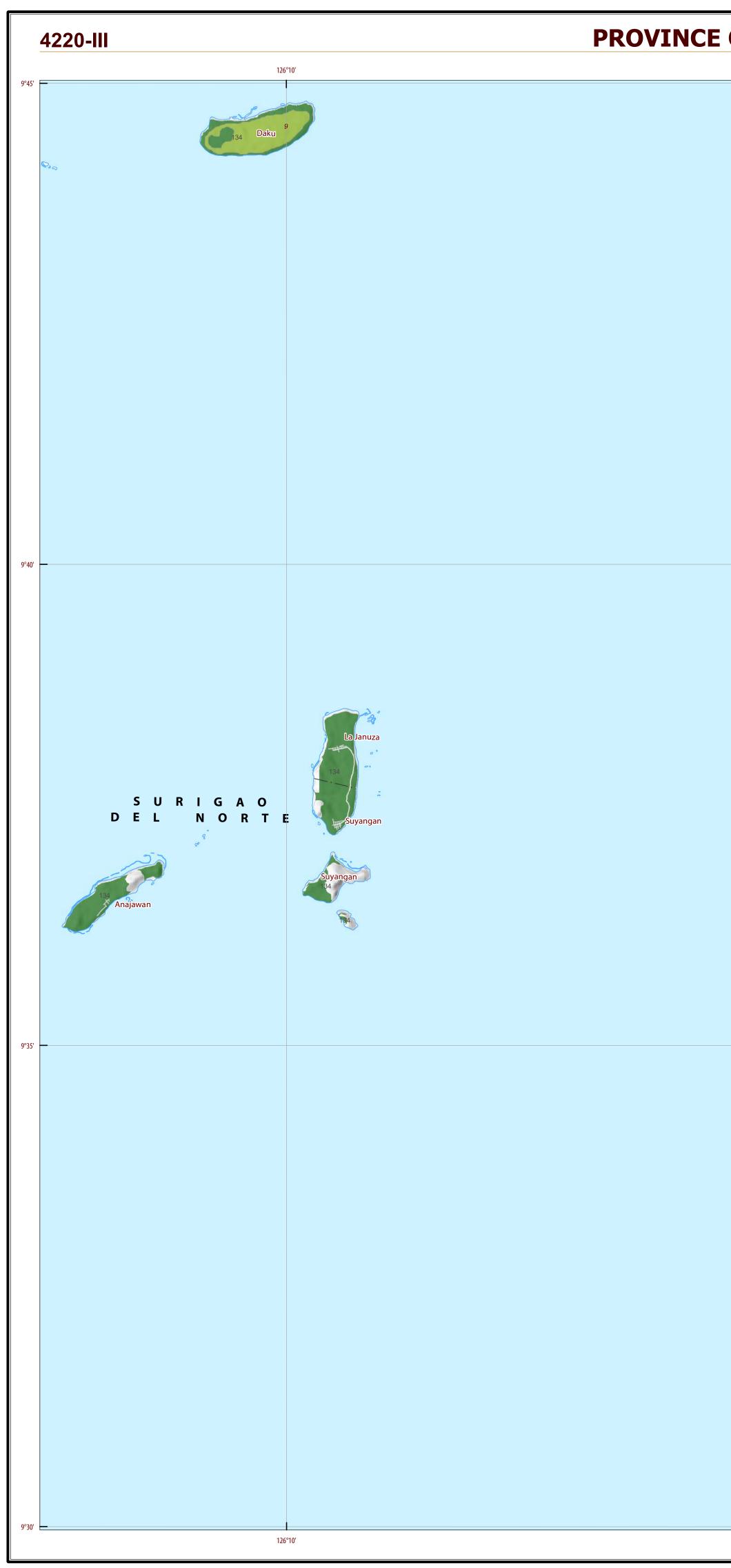
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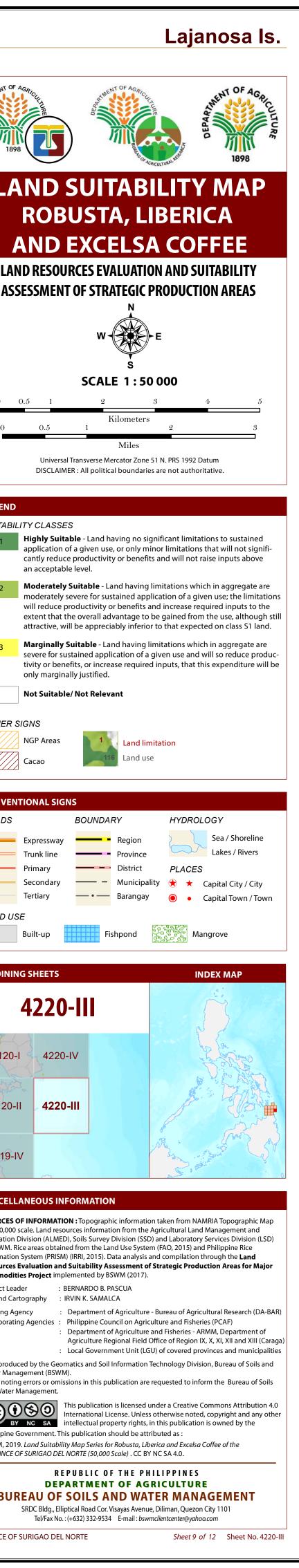


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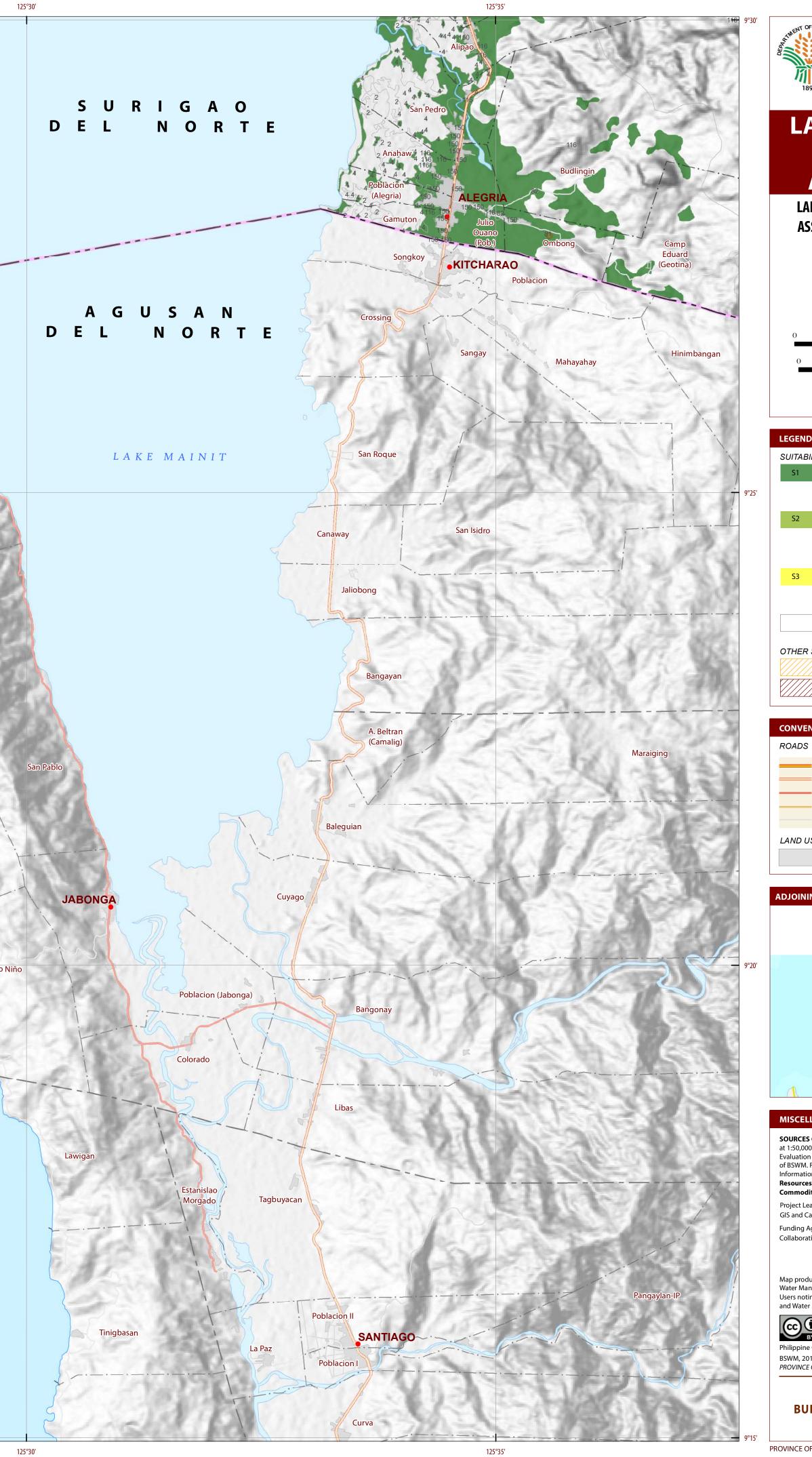
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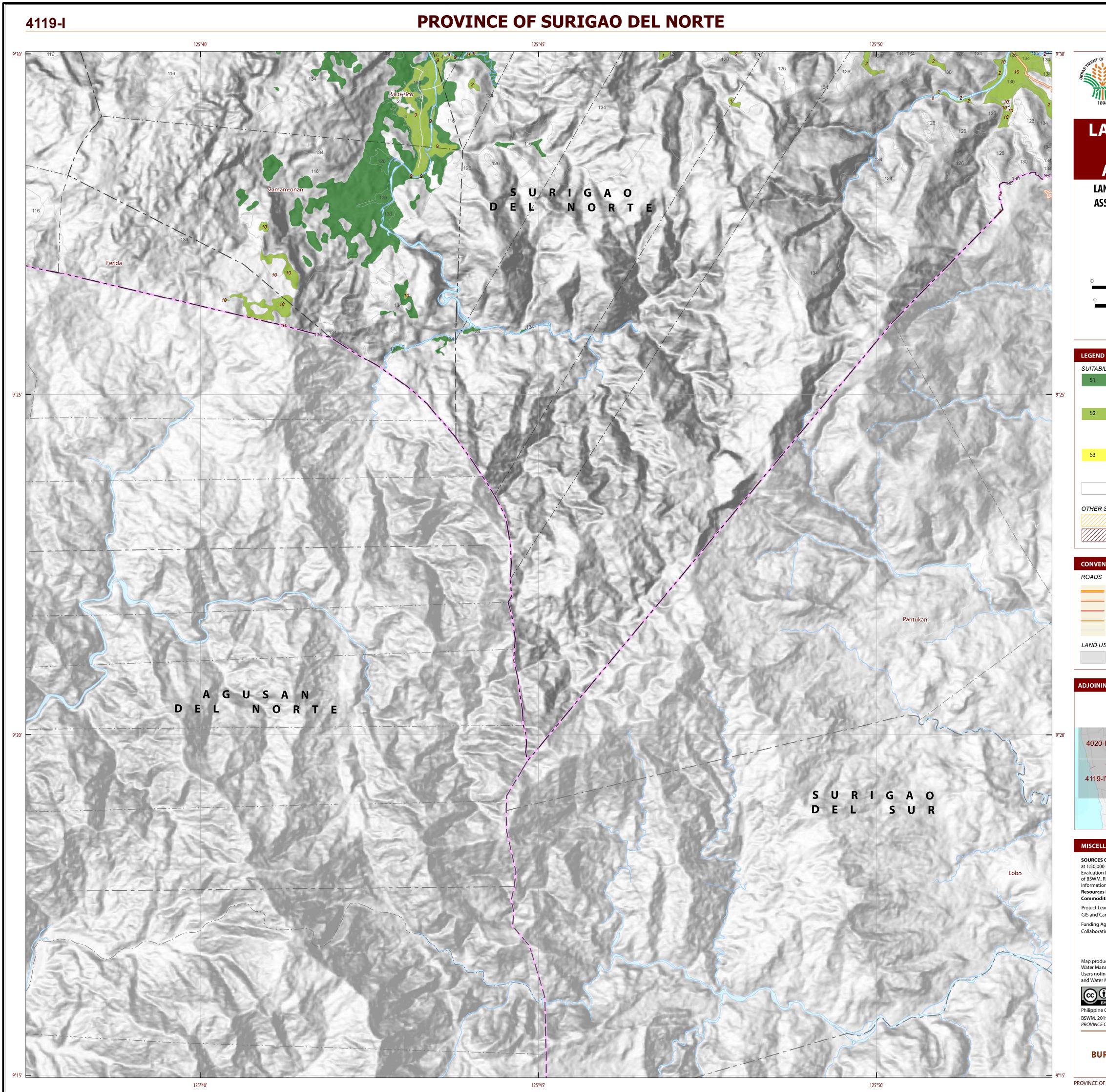
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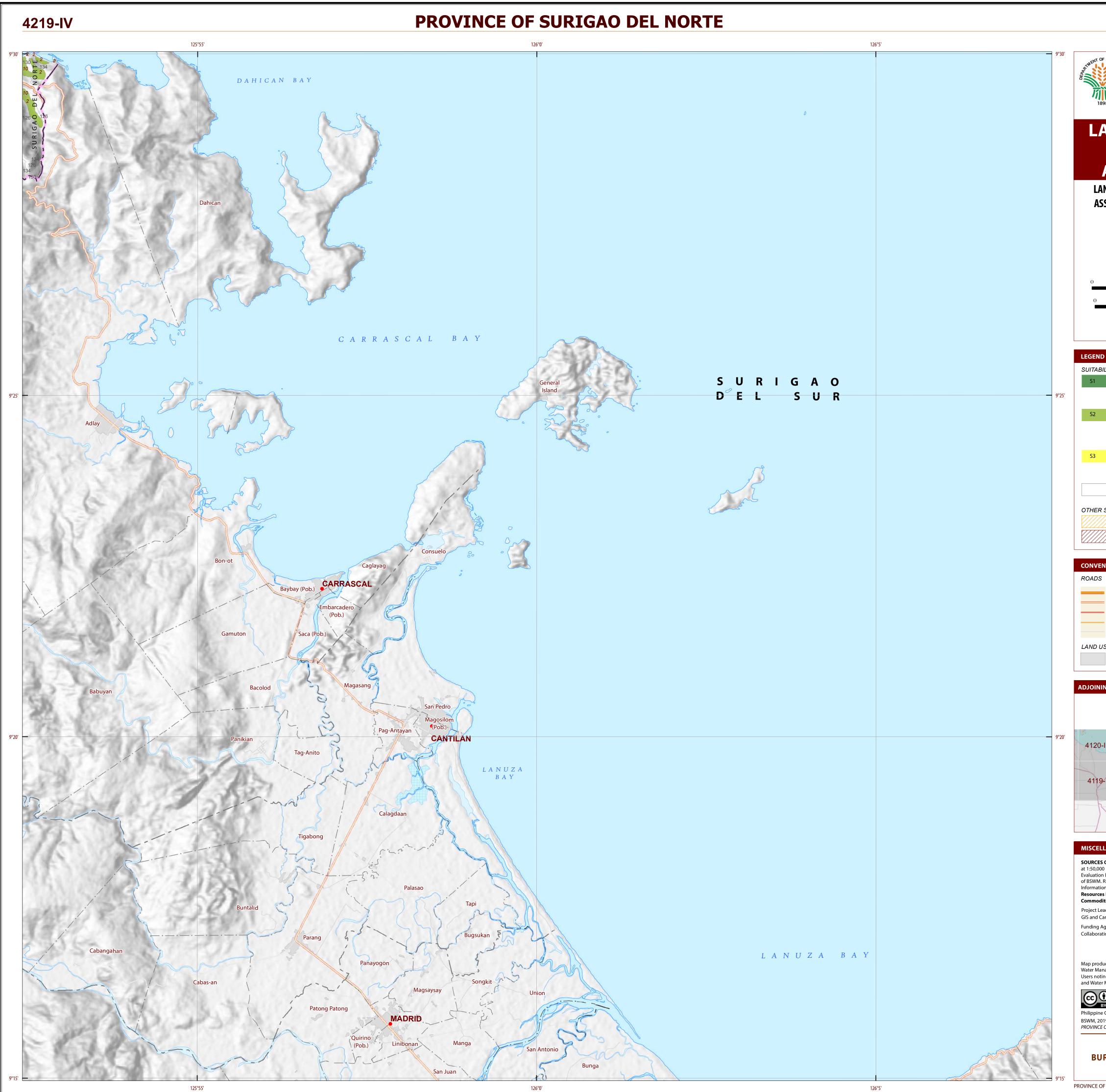


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