

# **LAND SUITABILITY MAP**

## **CACAO**

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

### **PROVINCE OF SURIGAO DEL SUR**



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

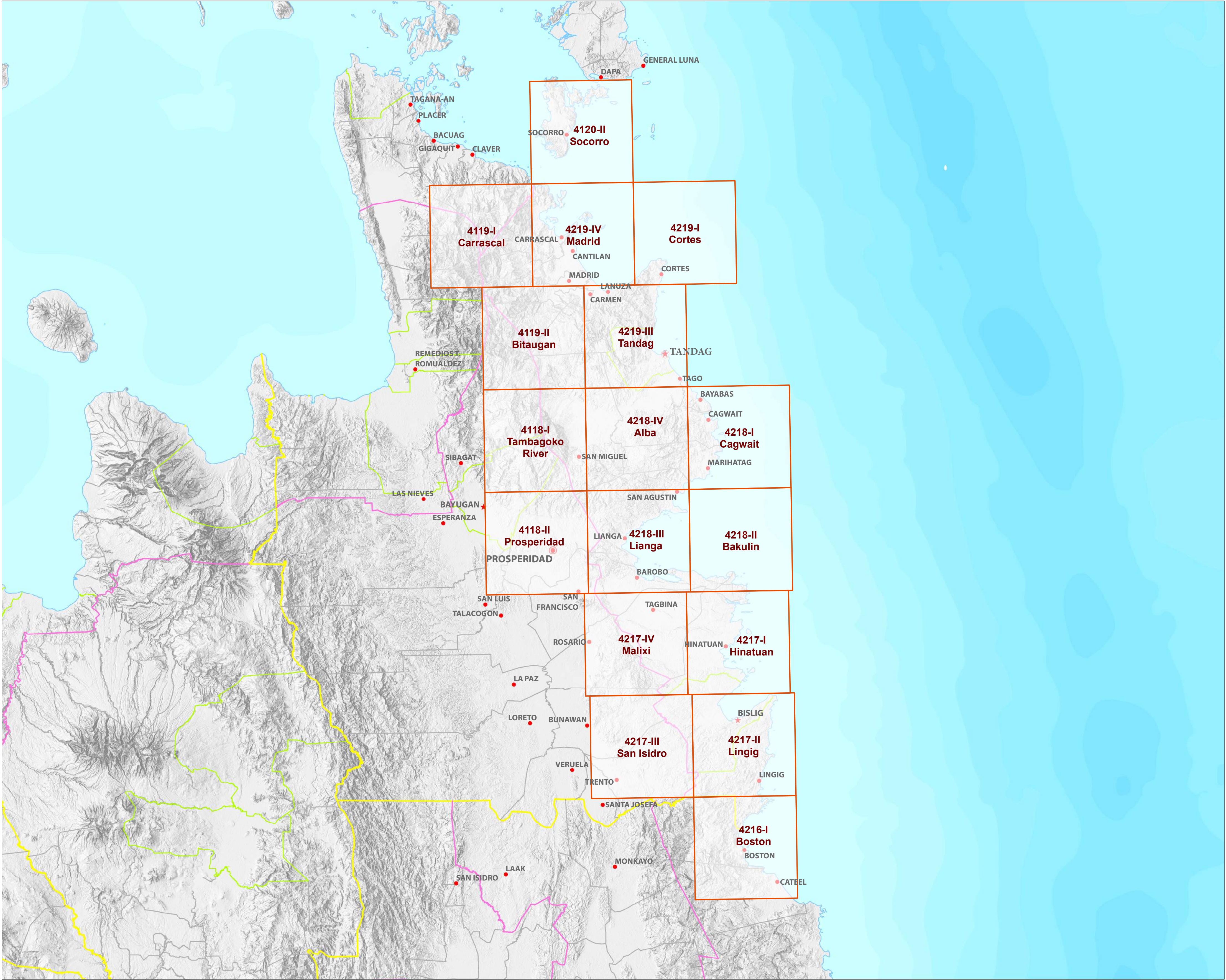
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## LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS

### PROVINCE OF SURIGAO DEL SUR



**LEGEND**

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- ★ City
- Capital Town
- Town

**Administrative Boundary**

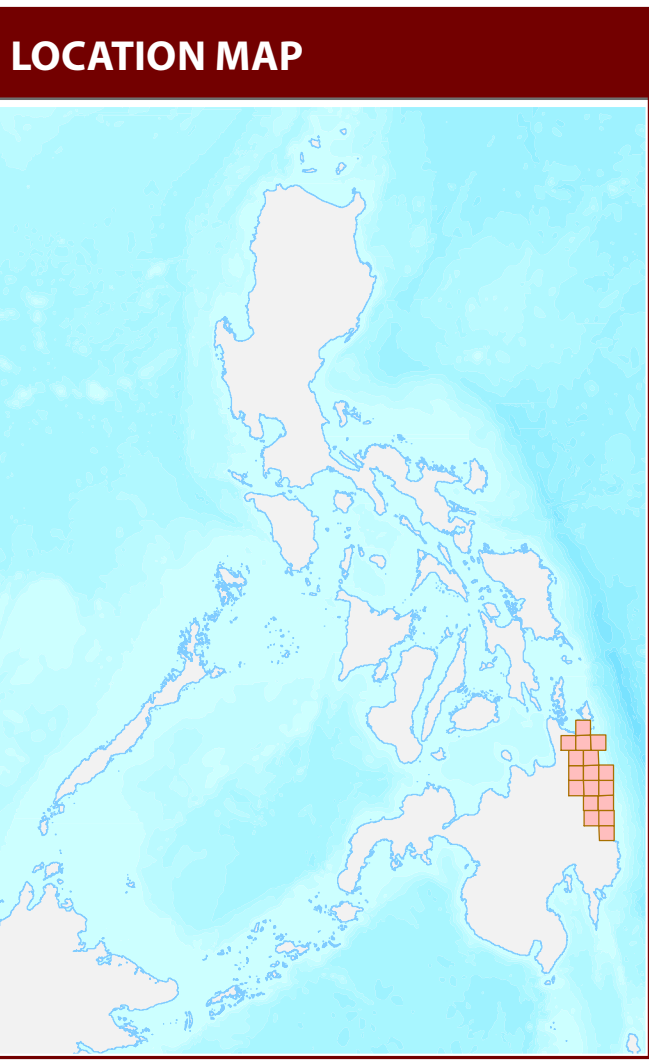
- Regional
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**MISCELLANEOUS INFORMATION**

Land suitability information 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).

Map produced by the Geomatics and Soil Information Technology Division, Bureau of Soils and Water Management (BSWM).

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# LAND SUITABILITY MAP FOR CACAO

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

### EXTENT OF SUITABILITY FOR CACAO PRODUCTION BY MUNICIPALITY

| MUNICIPALITY   | EXISTING CACAO (Ha) |    |    | TOTAL<br>EXISTING<br>AREA (Ha) | EXPANSION AREA (Ha) |        |                          |       |                          |       | CONFLICT RESOLUTION AREA (Ha) |       |                              |    |             |    | TOTAL<br>POTENTIAL<br>EXPANSION<br>AREA (Ha) |
|----------------|---------------------|----|----|--------------------------------|---------------------|--------|--------------------------|-------|--------------------------|-------|-------------------------------|-------|------------------------------|----|-------------|----|--|
|                |                     |    |    |                                | Coconut             |        | Shrubland,<br>unmanaged* |       | Grassland,<br>unmanaged* |       | Corn                          |       | Paddy rice,<br>non-irrigated |    | Other crops |    |  |
|                | S1                  | S2 | S3 |                                | S1                  | S2     | S1                       | S2    | S1                       | S2    | S1                            | S2    | S1                           | S2 | S1          | S2 |  |
| BAROBO         | -                   | -  | -  | -                              | 11,830              | 2,063  | 715                      | 25    | 64                       | 9     | 517                           | 42    | -                            | -  | -           | -  | 15,264                                       |
| BAYABAS        | -                   | -  | -  | -                              | 1,620               | 36     | 141                      | -     | -                        | -     | 278                           | 25    | -                            | -  | -           | -  | 2,101  |
| CAGWAIT        | -                   | -  | -  | -                              | 2,853               | 56     | 65                       | -     | -                        | -     | 322                           | -     | -                            | -  | -           | -  | 3,296  |
| CANTILAN       | -                   | -  | -  | -                              | 791                 | 420    | 29                       | 81    | 38                       | 100   | 1,808                         | 143   | -                            | -  | -           | -  | 3,409  |
| CARMEN         | -                   | -  | -  | -                              | 635                 | 54     | 39                       | 198   | 23                       | 94    | 273                           | 17    | -                            | -  | -           | -  | 1,334  |
| CARRASCAL      | -                   | -  | -  | -                              | 228                 | 510    | 596                      | 754   | 109                      | 927   | 308                           | 33    | -                            | -  | -           | -  | 3,467  |
| CITY OF BISLIG | 3                   | -  | -  | 3                              | 12,730              | 1,754  | 2,471                    | 71    | 549                      | 82    | 1,280                         | 5     | -                            | -  | -           | -  | 18,943                                       |
| CITY OF TANDAG | -                   | -  | -  | -                              | 1,308               | 2,795  | 230                      | 86    | 22                       | 124   | 322                           | 337   | -                            | -  | -           | -  | 5,225  |
| CORTES         | -                   | -  | -  | -                              | 711                 | 1,643  | 1                        | 39    | -                        | -     | 91                            | 43    | -                            | -  | -           | -  | 2,529  |
| HINATUAN       | -                   | -  | -  | -                              | 14,187              | 10,068 | 338                      | 593   | 547                      | 156   | 383                           | 22    | -                            | -  | -           | -  | 26,293                                       |
| LANUZA         | -                   | -  | -  | -                              | 790                 | 297    | 3                        | 274   | 18                       | 281   | 129                           | 2     | -                            | -  | -           | -  | 1,795  |
| LIANGA         | 1                   | -  | 1  | 2                              | 2,575               | 978    | 177                      | 169   | -                        | 137   | 77                            | -     | -                            | -  | -           | -  | 4,112  |
| LINGIG         | -                   | -  | -  | -                              | 2,650               | 7      | 806                      | -     | 158                      | -     | 83                            | -     | -                            | -  | -           | -  | 3,704  |
| MADRID         | -                   | -  | -  | -                              | 658                 | 492    | 12                       | 47    | 43                       | 20    | 1,594                         | 38    | -                            | -  | -           | -  | 2,904  |
| MARIHATAG      | -                   | -  | -  | -                              | 4,262               | 329    | 171                      | 471   | -                        | 73    | 810                           | -     | -                            | -  | -           | -  | 6,117  |
| SAN AGUSTIN    | -                   | -  | -  | -                              | 1,912               | 216    | 98                       | 582   | 8                        | 163   | 497                           | -     | -                            | -  | -           | -  | 3,475  |
| SAN MIGUEL     | -                   | -  | -  | -                              | 3,178               | 522    | 777                      | 472   | 335                      | 169   | 5,745                         | 100   | -                            | -  | -           | -  | 11,299                                       |
| TAGBINA        | -                   | -  | -  | -                              | 24,841              | 6,486  | 370                      | 90    | 1,102                    | 313   | 190                           | 34    | -                            | -  | -           | -  | 33,427                                       |
| TAGO           | -                   | -  | -  | -                              | 2,921               | 1,462  | 182                      | 1     | 15                       | 14    | 3,707                         | 2,890 | -                            | -  | -           | -  | 11,192                                       |
| TOTAL          | 4                   | -  | 1  | 5                              | 90,680              | 30,188 | 7,221                    | 3,955 | 3,031                    | 2,663 | 18,415                        | 3,732 | -                            | -  | -           | -  | 159,885                                      |

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

### AGRONOMIC REQUIREMENT OF CACAO 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 |
|-----------------------|--------------------|-----------|-----------------|-------------------------------|---------------|------------------------|--------------------|----------------|---------------|---------------|------------------|----------------------|---------------|
| Cacao                 | 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    | 50 - 100        | FSL, L, SiL                   | SPD,PD        | 5.1 - 5.5<br>7.3 - 7.8 | medium             | moderate       | moderate      | common        | 1000-1500        | 1000-2000            | I, II         |
|                       | S3                 | >30       | <50             | S, LS, CSL, SL                | VPD,ED        | <5.0 - > 7.9           | low                | severe         | severe        | many          | >1500            | >4500                |               |

|  |   |  |   |   |
|--|---|--|---|---|
| <b>SLOPE (%)</b><br>0 - 3 - level to gently sloping<br>3 - 8 - gently sloping to undulating<br>8 - 18 - undulating to rolling<br>18 - 30 - rolling to moderately steep<br>30 - 50 - steep<br>> 50 - very steep | <b>SOIL DRAINAGE</b><br>ED - excessively drained<br>WD - well drained<br>MWD - moderately well drained<br>SPD - somewhat poorly drained<br>PD - poorly drained<br>VPD - very poorly drained | <b>SOIL REACTION (pH)</b><br>< 4.5 - extremely acid<br>4.5 - 5.0 - very strongly acid<br>5.1 - 5.5 - strongly acid<br>5.6 - 6.0 - medium acid<br>6.1 - 6.5 - slightly acid<br>6.6 - 7.2 - neutral<br>7.3 - 7.8 - mildly alkaline<br>7.9 - 8.4 - moderately alkaline<br>> 8.5 - strongly alkaline | <b>SOIL TEXTURE</b><br><b>Coarse</b><br>S - sand<br>LS - loamy sand<br>CSL - coarse sandy loam<br>SL - sandy loam<br><b>Medium</b><br>FSL - fine sandy loam<br>L - loam<br>SiL - silt loam<br>CL - clay loam<br>SiCL - silty clay loam<br>SCL - sandy clay loam | <b>Fine</b><br>SC - sandy clay<br>SiC - silty clay<br>C - clay<br>HC - heavy clay |
| <b>SOIL DEPTH (cm)</b><br>0 - 30 - very shallow<br>30 - 50 - shallow<br>50 - 100 - moderately deep<br>> 100 - deep to very deep  | <b>SURFACE IMPEDIMENT</b><br>ROCK OUTCROPS<br>< 10% - none - few<br>10 - 30% - common<br>> 30% - many   |  |   |   |

### LAND LIMITATIONS DESCRIPTION AND COMBINATIONS

|  |   |   |   |
|--|---|---|---|
| <b>ELEVATION</b><br>EI2 - 1000m - 1500m<br>EI3 - > 1500m                                   | <b>SOIL DRAINAGE</b><br>D2 - Somewhat poorly drained to poorly drained<br>D3 - Very poorly drained or excessively drained | <b>SOIL DEPTH</b><br>Sh2 - Moderately deep (50 - 100cm)<br>Sh3 - Very shallow to shallow (< 50cm) | <b>SOIL EROSION</b><br>E2 - Moderate erosion<br>E3 - Severe erosion                 |
| <b>SLOPE/TOPOGRAPHY</b><br>T2 - Undulating to moderately steep<br>T3 - Steep to very steep | <b>SOIL TEXTURE</b><br>Tc - Coarse texture  | <b>ROCK OUTCROPS</b><br>Rc2 - Common<br>Rc3 - Many  | <b>FLOODING</b><br>F2 - Moderate seasonal flooding<br>F3 - Severe seasonal flooding |

| CODE | LIMITATION     | CODE | LIMITATION    | CODE | LIMITATION        | CODE | LIMITATION        | CODE | LIMITATION        |
|------|----------------|------|---------------|------|-------------------|------|-------------------|------|-------------------|
| 1    | E2-Sh2-Rc2     | 11   | F3-D2         | 21   | T2-EI2-E3         | 31   | T3-E3-Sh2-Rc3     | 41   | T3                |
| 2    | EI2            | 12   | Sh2           | 22   | T2-EI2-E3-Rc2     | 32   | T3-E3-Sh3-Rc2     | 42   | T3-E3             |
| 3    | EI2-E2-Sh2-Rc3 | 13   | Sh2-Rc2       | 23   | T2-EI2-E3-Rc3     | 33   | T3-E3-Sh3-Rc3     | 43   | T3-E3-Sh3-Rc3     |
| 4    | EI2-E3-Rc3     | 14   | T2            | 24   | T2-EI2-E3-Sh2-Rc2 | 34   | T3-EI2            | 44   | T3-EI2            |
| 5    | EI2-E3-Sh2-Rc3 | 15   | T2-E3         | 25   | T2-EI2-E3-Sh2-Rc3 | 35   | T3-EI2-E3-Rc2     | 45   | T3-EI2-E3         |
| 6    | EI2-Rc2        | 16   | T2-E3-Rc2     | 26   | T2-F2-D2          | 36   | T3-EI2-E3-Sh2-Rc3 | 46   | T3-EI2-E3-Rc3     |
| 7    | EI2-Sh2-Rc2    | 17   | T2-E3-Rc3     | 27   | T2-F3-D2          | 37   | T3-EI2-E3-Sh3-Rc2 | 47   | T3-EI2-E3-Sh3-Rc3 |
| 8    | EI2-Sh2-Rc3    | 18   | T2-E3-Sh2-Rc2 | 28   | T3                | 38   | T3-EI2-E3-Sh3-Rc3 | 48   | T3-EI3            |
| 9    | F2-D2          | 19   | T2-E3-Sh2-Rc3 | 29   | T3-E3             | 39   | T3-F2-D2          | 49   | Tc                |
| 10   | F2-Tc          | 20   | T2-EI2        | 30   | T3-E3-Rc2         | 40   | T3-F3-D2          |      |                   |

| CODE | LANDUSE           |
|------|-------------------|
| 4    | Corn              |
| 81   | Coffee            |
| 82   | Cacao             |
| 116  | Coconut           |
| 126  | Grassland         |
| 134  | Shrubs, unmanaged |
| 136  | Forest            |
|      |                   |
|      |                   |
|      |                   |

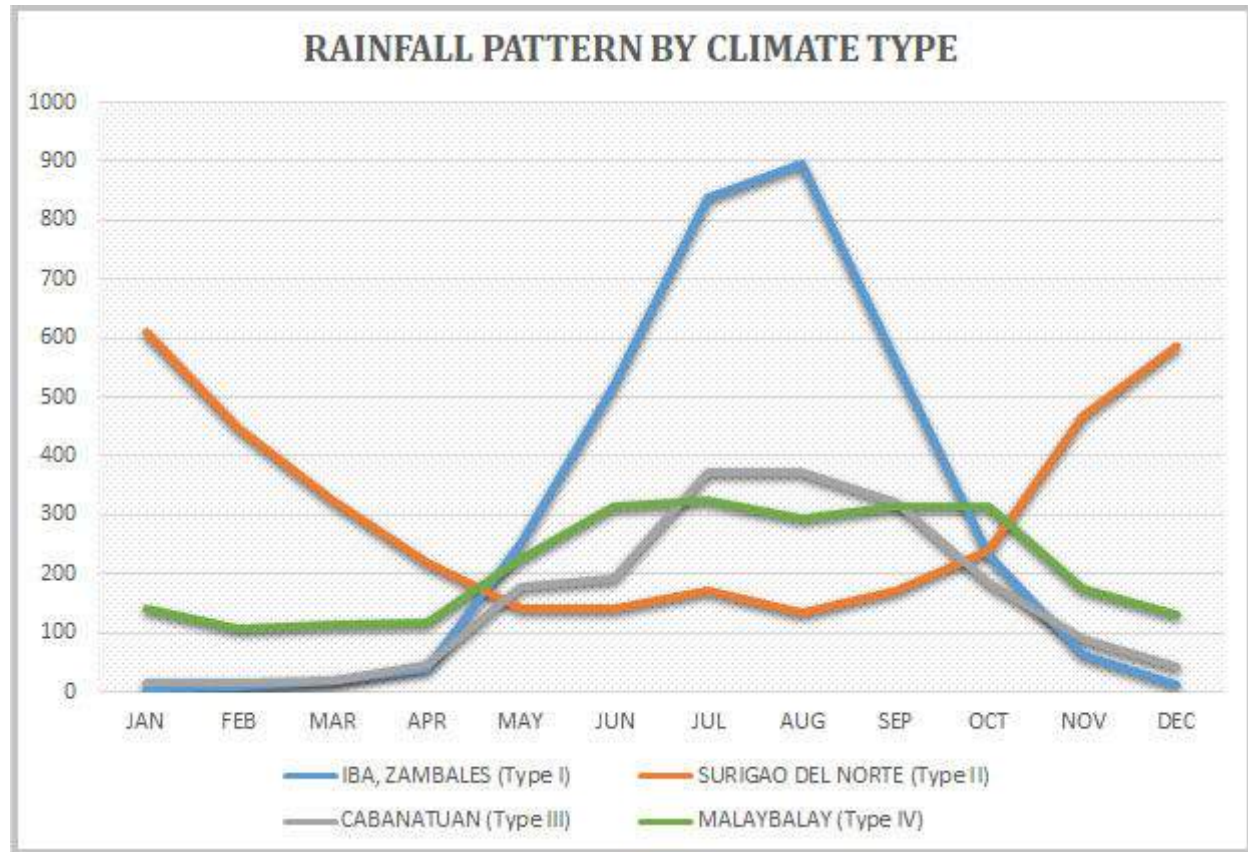
### SUITABILITY CLASSES:

|  |  |
|--|--|
| <b>Highly Suitable (S1)</b><br>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.   | <b>Marginally Suitable (S3)</b><br>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.   |
| <b>Moderately Suitable (S2)</b><br>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. | <b>Not Suitable / Not Relevant</b><br>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. |

### CLIMATE TYPE

|   |  |
|---|--|
| <b>TYPE I</b> : Two pronounced season, dry from November to April and wet during the rest of the year. Maximum rain period is from June to September  | <b>TYPE II</b> : 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. |
| <b>TYPE III</b> : 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. | <b>TYPE IV</b> : Rainfall is more or less evenly distributed throughout the year. This type resembles Type II since it has no dry season.  |

Surigao Del Sur is classified as climatic Type II.



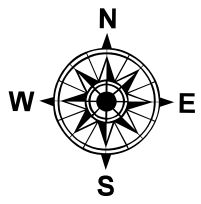
Source: PAGASA 2018, *Climatological Normals (Rainfall)*, Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), accessed 27 July 2018, <<https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>>.





LAND SUITABILITY MAP  
CACAO

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

- 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** - 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

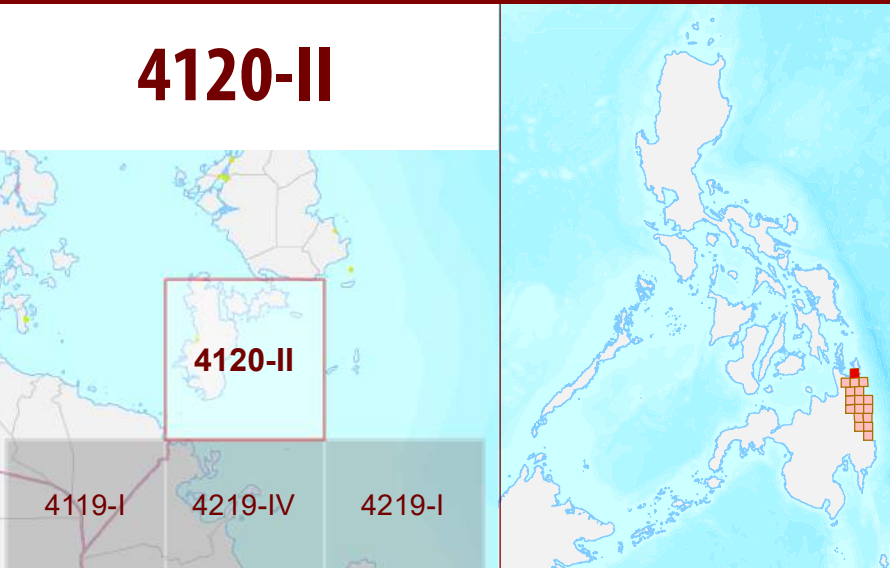
OTHER SIGNS

- 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



MISCELLANEOUS INFORMATION

**SOURCES OF INFORMATION** : Topographic information taken from NAMRIA Topographic Map at 1:50,000 scale. Land resources information from the Agricultural Land Management and Evaluation Division (ALMED), Soils Survey Division (SSD) and Laboratory Services Division (LSD) of BSWM. Rice areas obtained from the Land Use System (FAO, 2015) and Philippine Rice Information System (PRISM) (IRRI, 2015). Data analysis and compilation through the **Land Resources Evaluation and Suitability Assessment of Strategic Production Areas for Major Commodities Project** implemented by BSWM (2017).

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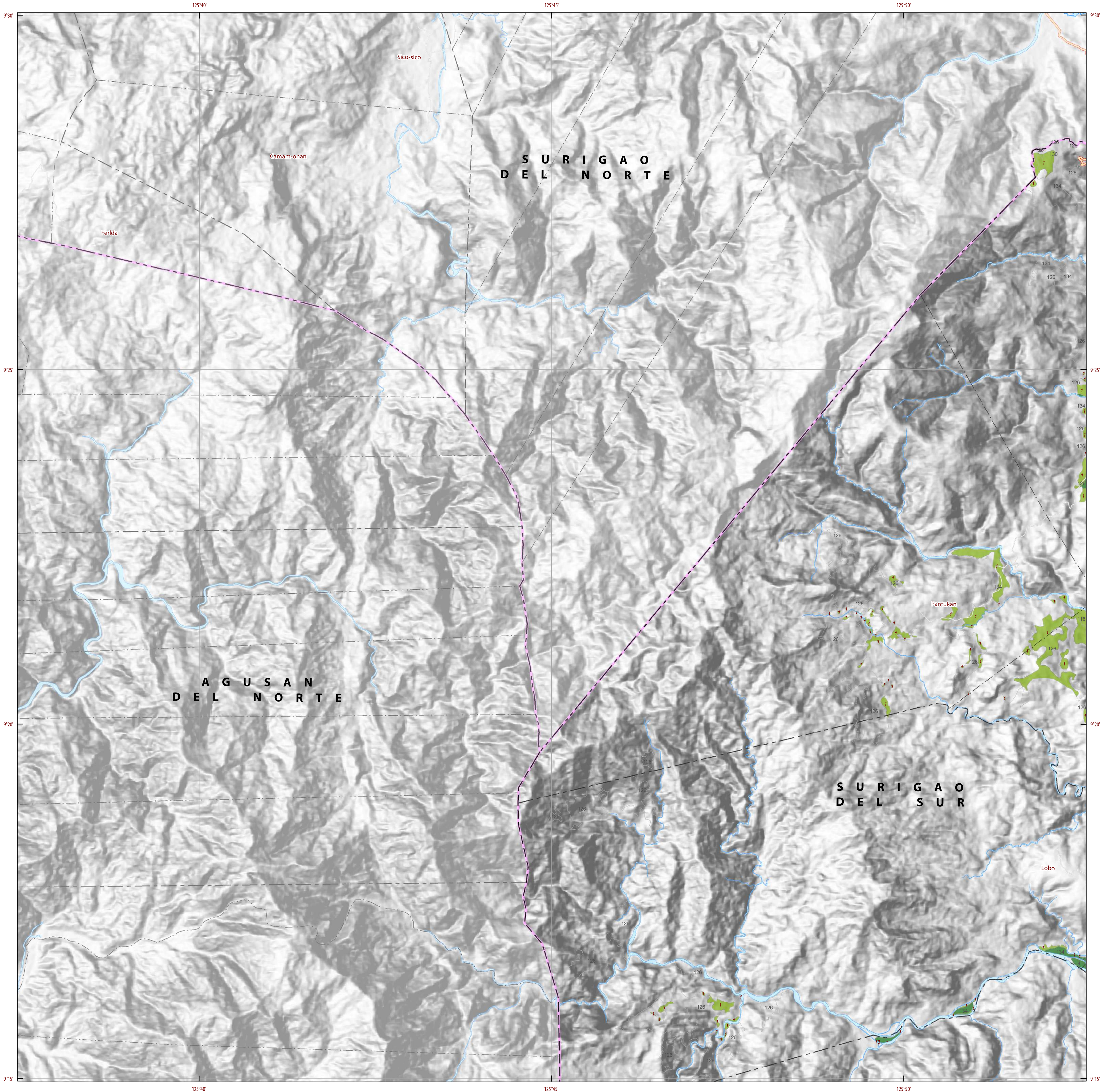
Funding Agency : Department of Agriculture - Bureau of Agricultural Research (DA-BAR)  
Collaborating Agencies : Philippine Council on Agriculture and Fisheries (PCAF)  
: Department of Agriculture and Fisheries - ARMM, Department of Agriculture Regional Field Office of Region IX, X, XI, XII and XIII (Caraga)  
: Local Government Unit (LGU) of covered provinces and municipalities




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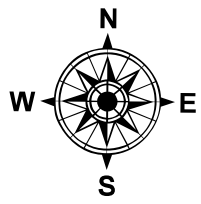








LAND SUITABILITY MAP  
CACAO

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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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** - 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.

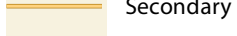
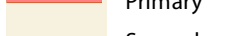



**Not Suitable/ Not Relevant**

OTHER SIGNS

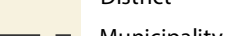


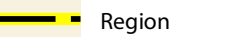
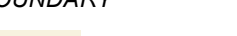


CONVENTIONAL SIGNS

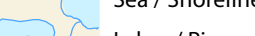

ROADS





BOUNDARY





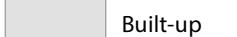
HYDROLOGY



PLACES

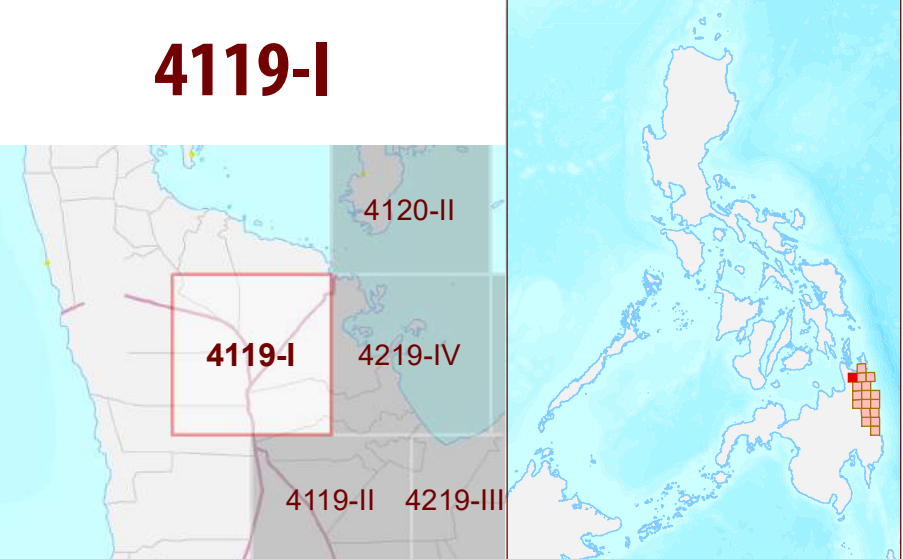


LAND USE



ADJOINING SHEETS

4119-I



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PROVINCE OF SURIGAO DEL SUR

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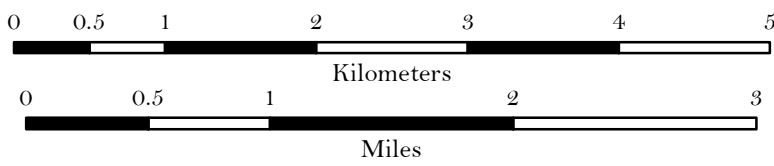


## LAND SUITABILITY MAP CACAO

### 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

- 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** - 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

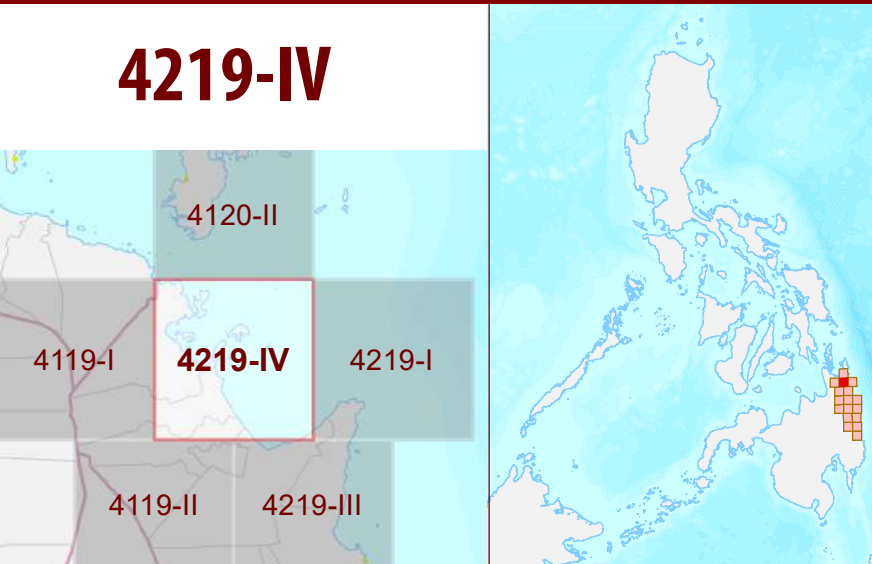
##### OTHER SIGNS

- 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



#### MISCELLANEOUS INFORMATION

**SOURCES OF INFORMATION** : Topographic information taken from NAMRIA Topographic Map at 1:50,000 scale. Land resources information from the Agricultural Land Management and Evaluation Division (ALMED), Soils Survey Division (SSD) and Laboratory Services Division (LSD) of BSWM. Rice areas obtained from the Land Use System (FAO, 2015) and Philippine Rice Information System (PRISM) (IRRI, 2015). Data analysis and compilation through the **Land Resources Evaluation and Suitability Assessment of Strategic Production Areas for Major Commodities Project** implemented by BSWM (2017).

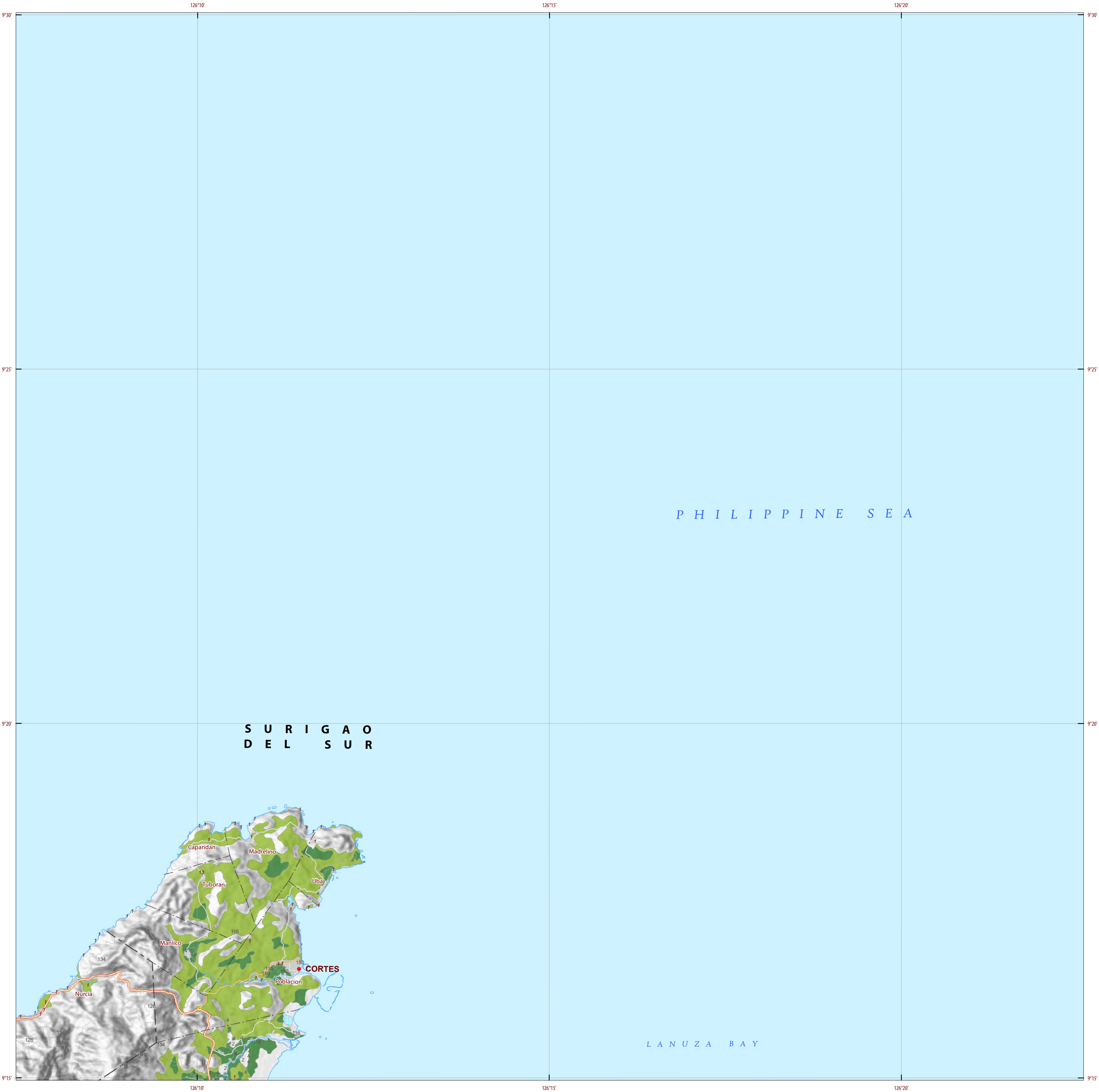
Project Leader : BERNARDO B. PASCUA  
GIS and Cartography : IRVIN K. SAMALCA  
Funding Agency : Department of Agriculture - Bureau of Agricultural Research (DA-BAR)  
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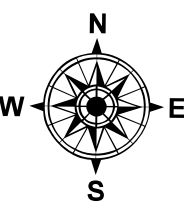






## LAND SUITABILITY MAP CACAO

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



**SCALE 1 : 50 000**

00.512345

Kilometers

00.5123

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.

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

Land limitation

Land use

**CONVENTIONAL SIGNS**

**ROADS**

Expressway

**BOUNDARY**

Region

**HYDROLOGY**

Sea / Shoreline

**PLACES**

Province

**LAND USE**

Built-up

**PLACES**

District

**PLACES**

Municipality

**PLACES**

Capital City / City

**PLACES**

Capital Town / Town

**PLACES**

Barangay

**PLACES**

Fishpond

**PLACES**

Mangrove

**ADJOINING SHEETS**

4219-I

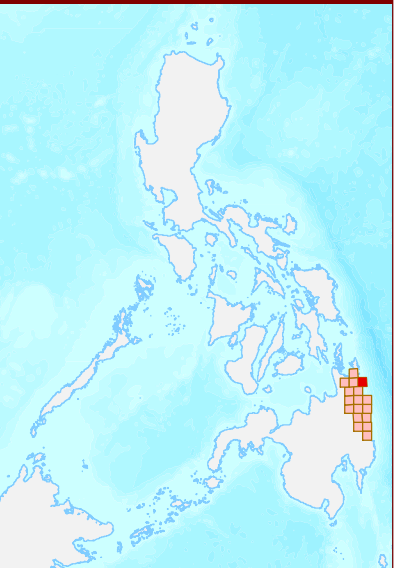
4120-II

4219-IV

4119-II

4219-III

**INDEX MAP**



**MISCELLANEOUS INFORMATION**

**SOURCES OF INFORMATION :** Topographic information taken from NAMRIA Topographic Map at 1:50,000 scale. Land resources information from the Agricultural Land Management and Evaluation Division (ALMED), Soils Survey Division (SSD) and Laboratory Services Division (LSD) of BSWM. Rice areas obtained from the Land Use System (FAO, 2015) and Philippine Rice Information System (PRISM) (IRRI, 2015). Data analysis and compilation through the **Land Resources Evaluation and Suitability Assessment of Strategic Production Areas for Major Commodities Project** implemented by BSWM (2017).

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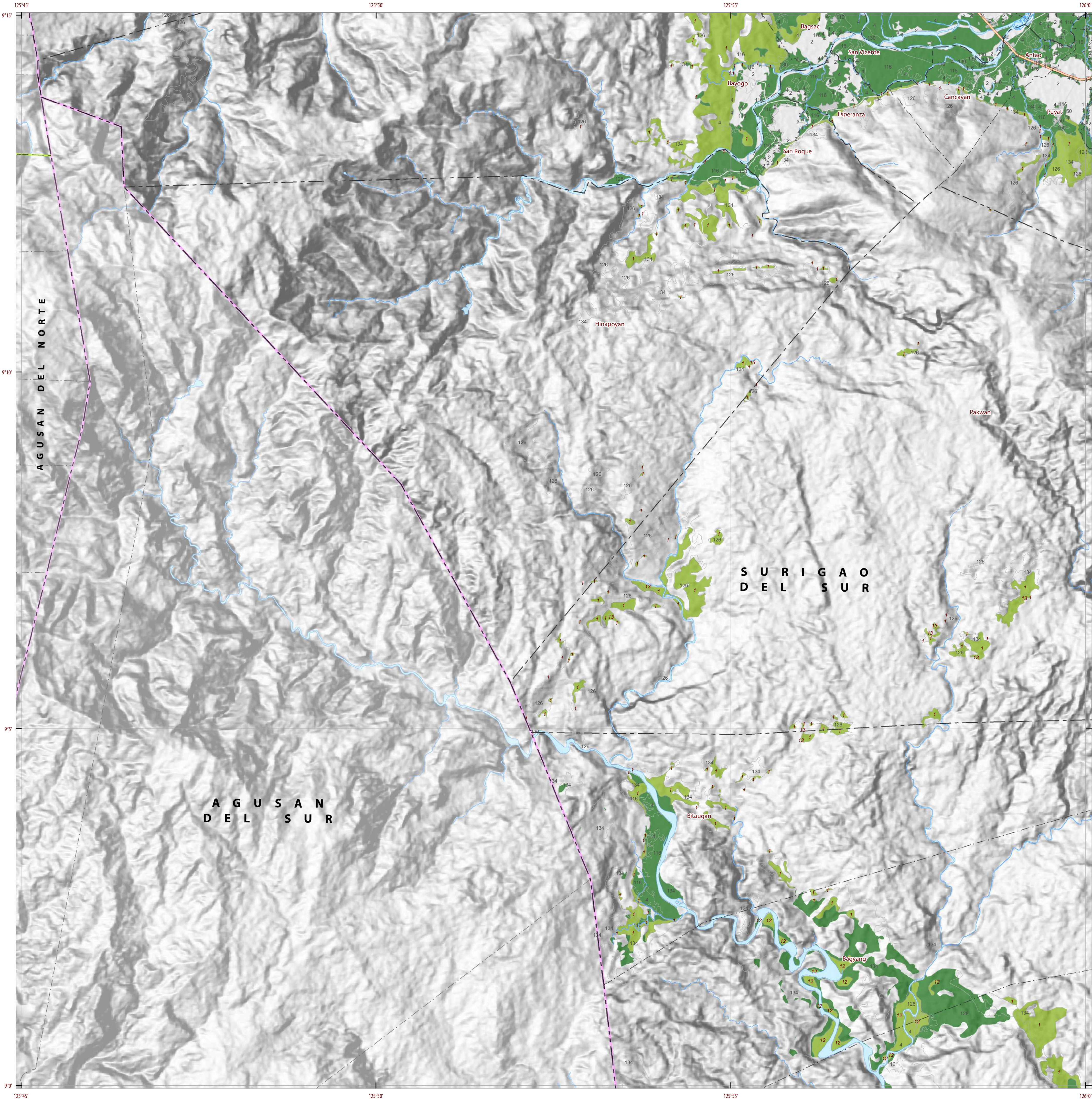
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**DEPARTMENT OF AGRICULTURE**  
**BUREAU OF SOILS AND WATER MANAGEMENT**  
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PROVINCE OF SURIGAO DEL SUR

Sheet 4 of 17

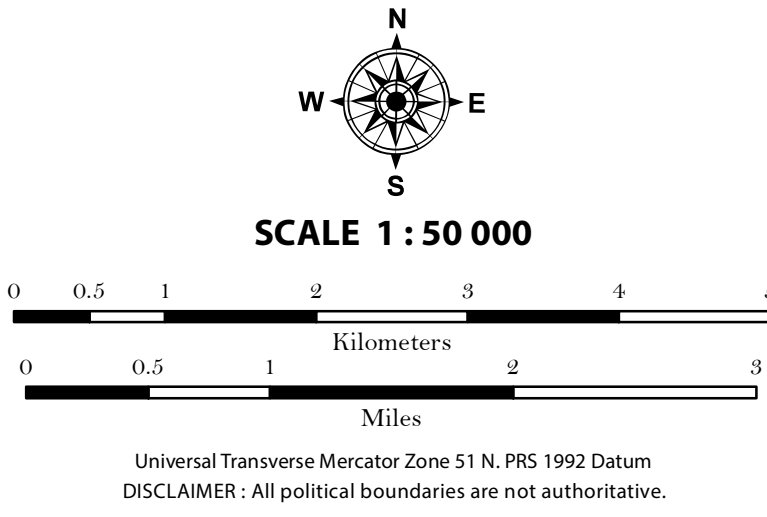
Sheet No. 4219-I





LAND SUITABILITY MAP  
CACAO

LAND RESOURCES EVALUATION AND SUITABILITY  
ASSESSMENT OF STRATEGIC PRODUCTION AREAS



**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** - 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**

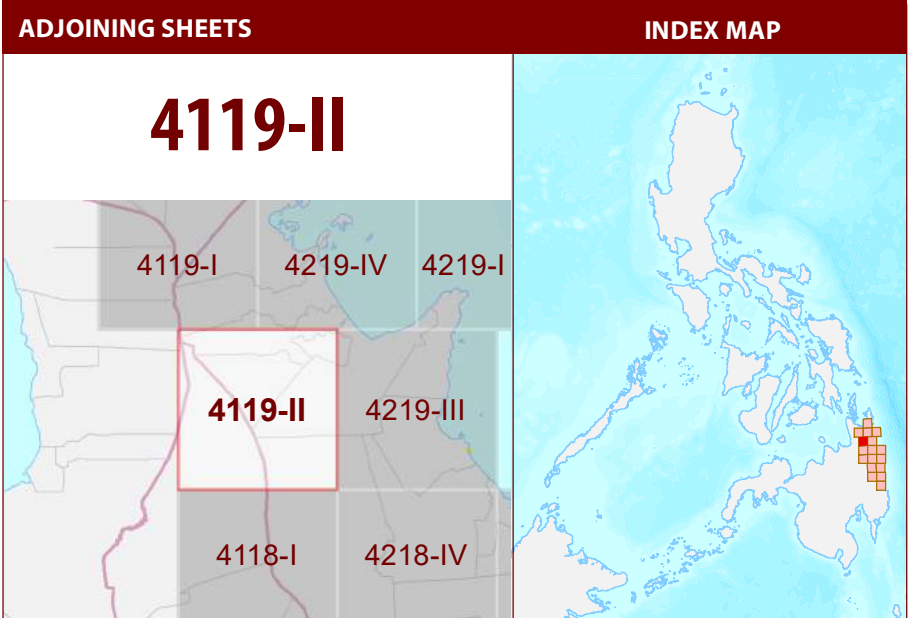
- Sea / Shoreline
- Lakes / Rivers

**PLACES**

- Capital City / City
- Capital Town / Town

**LAND USE**

- Built-up
- Fishpond
- Mangrove



**MISCELLANEOUS INFORMATION**

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: Local Government Unit (LGU) of covered provinces and municipalities

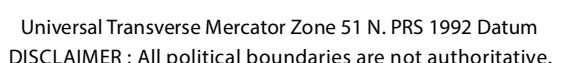
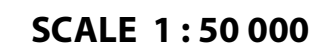
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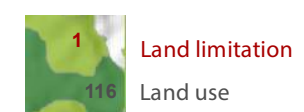


## LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS



### SUITABILITY CLASSES

- ☐
- Not Suitable/ Not Relevant**

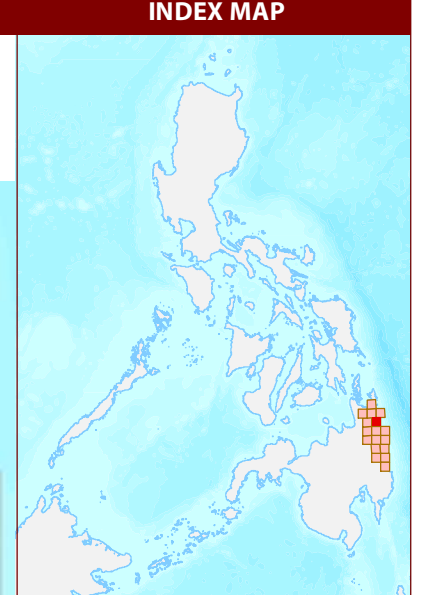
 NGP A

## ROADS

- ## LAND USE

- Built-u**

## INDEX MAP



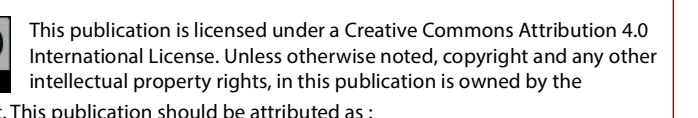
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                                  Department of Agriculture and Fisheries - ARMM, Department of Agriculture Regional Field Office of Region IX, X, XI and XIII (Cagayan),  
                                  Local Government Unit (LGU) of covered provinces and municipalities

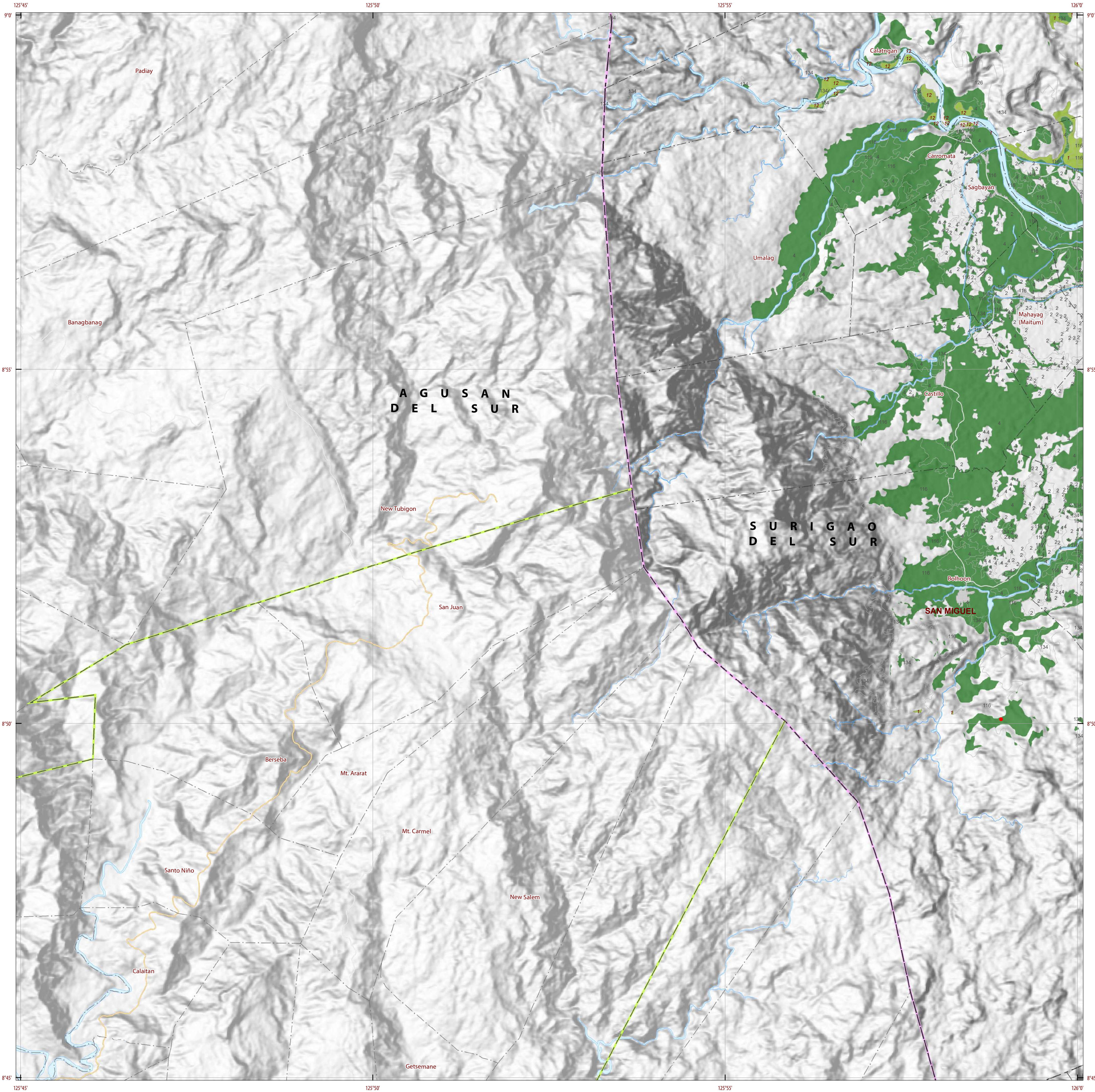
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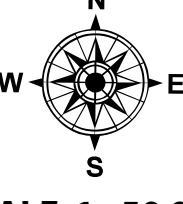





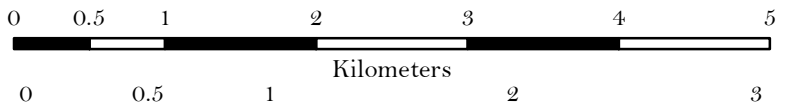


LAND SUITABILITY MAP  
CACAO

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.

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.

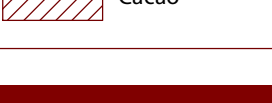
S3

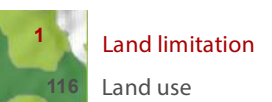
Marginally Suitable - Land having limitations which in aggregate are severe for sustained application of a given use and will so reduce productivity or benefits, or increase required inputs, that this expenditure will be only marginally justified.


Not Suitable/ Not Relevant

OTHER SIGNS

 NGP Areas


 Cacao

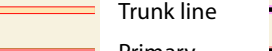
 Land limitation

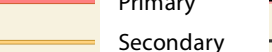
 Land use


CONVENTIONAL SIGNS


ROADS

 Expressway


 Trunk line


 Primary

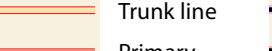
 Secondary

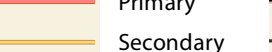
 Tertiary


BOUNDARY

 Region


 Province

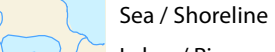
 District

 Municipality

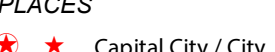
 Barangay

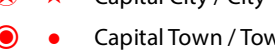
HYDROLOGY

 Sea / Shoreline


 Lakes / Rivers


PLACES


 Capital City / City

 Capital Town / Town

LAND USE

 Built-up

 Fishpond

 Mangrove

ADJOINING SHEETS

4118-I

4119-II

4219-III

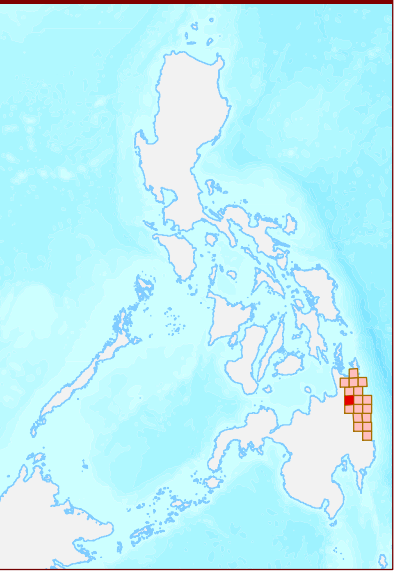
4118-I

4218-IV

4118-II

4218-III

INDEX MAP



MISCELLANEOUS INFORMATION

SOURCES OF INFORMATION : Topographic information taken from NAMRIA Topographic Map at 1:50,000 scale. Land resources information from the Agricultural Land Management and Evaluation Division (ALMED), Soils Survey Division (SSD) and Laboratory Services Division (LSD) of BSWM. Rice areas obtained from the Land Use System (FAO, 2015) and Philippine Rice Information System (PRISM) (IRRI, 2015). Data analysis and compilation through the Land Resources Evaluation and Suitability Assessment of Strategic Production Areas for Major Commodities Project implemented by BSWM (2017).

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BUREAU OF SOILS AND WATER MANAGEMENT

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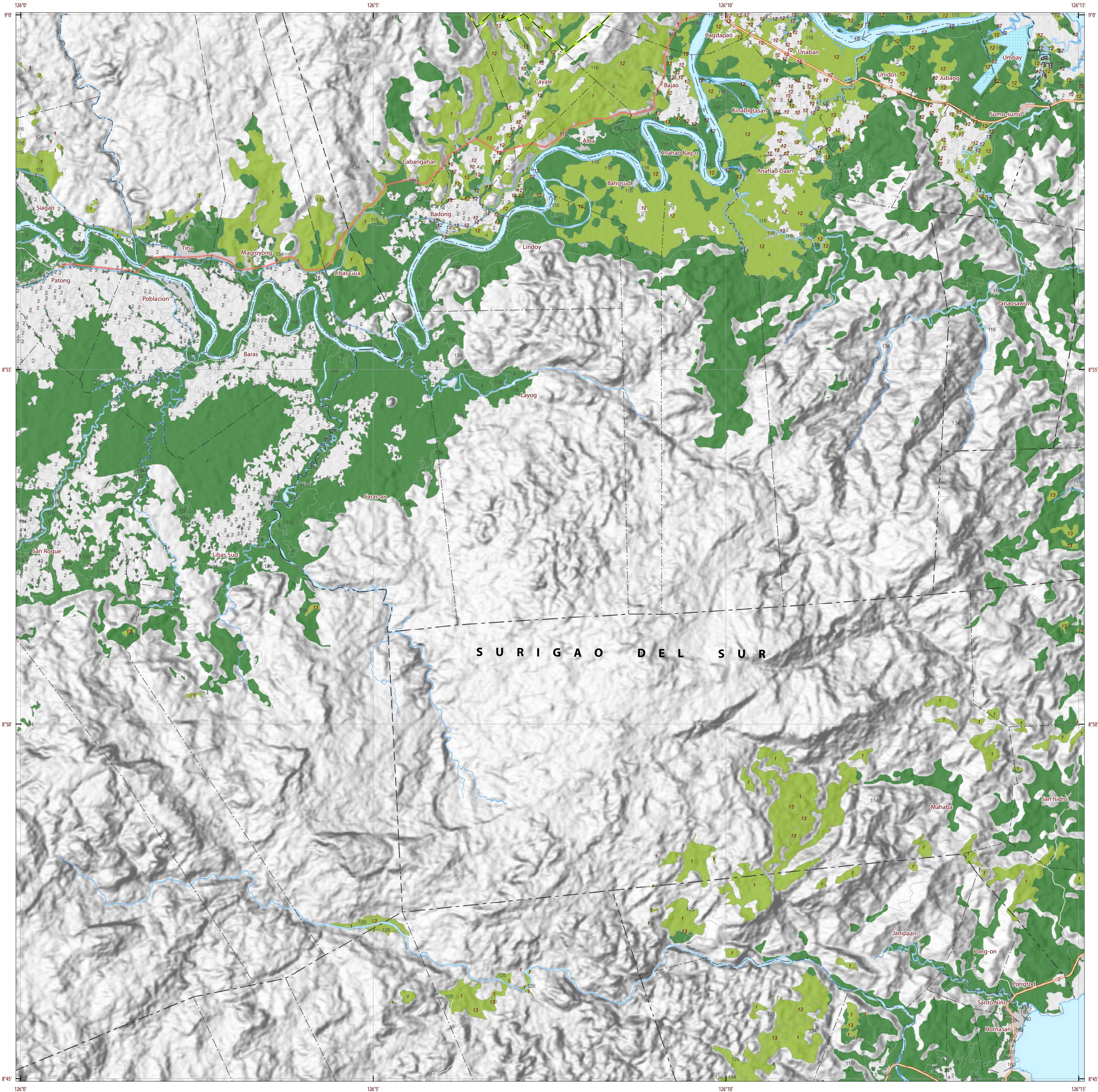
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PROVINCE OF SURIGAO DEL SUR

Sheet 7 of 17

Sheet No. 4118-I





## LAND SUITABILITY MAP CACAO

### 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

- 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** - 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

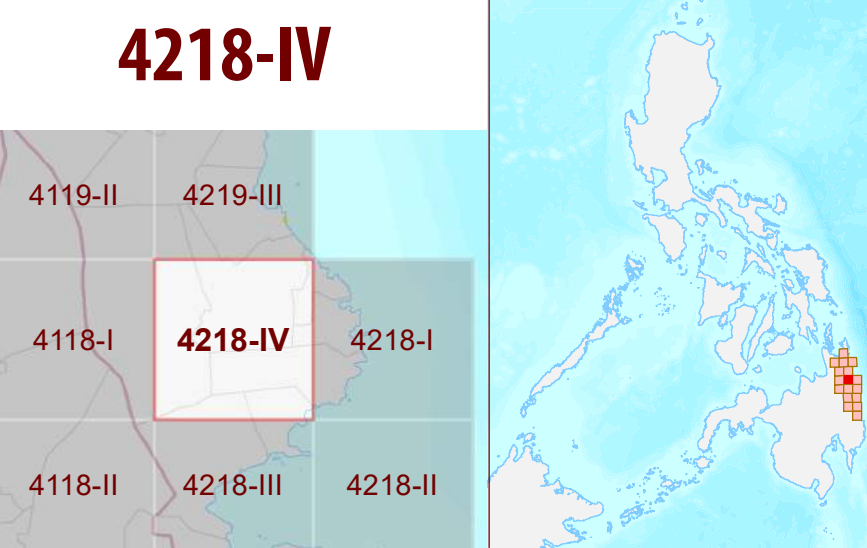
##### OTHER SIGNS

- 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



#### MISCELLANEOUS INFORMATION

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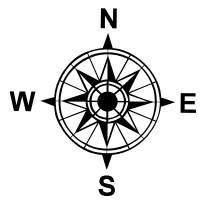








LAND SUITABILITY MAP  
CACAO

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

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.

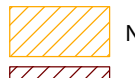
S3


Marginally Suitable


- 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

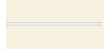
ROADS

 Expressway


 Trunk line


 Primary


 Secondary

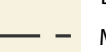
 Tertiary

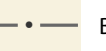
BOUNDARY

 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

4218-I

4219-III

4218-IV

4218-III

4218-II

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MISCELLANEOUS INFORMATION

SOURCES OF INFORMATION

Topographic information taken from NAMRIA Topographic Map at 1:50,000 scale. Land resources information from the Agricultural Land Management and Evaluation Division (ALMED), Soils Survey Division (SSD) and Laboratory Services Division (LSD) of BSWM. Rice areas obtained from the Land Use System (FAO, 2015) and Philippine Rice Information System (PRISM) (IRRI, 2015). Data analysis and compilation through the Land Resources Evaluation and Suitability Assessment of Strategic Production Areas for Major Commodities Project implemented by BSWM (2017).

Project Leader

IRVIN K. SAMALCA

Funding Agency

Department of Agriculture - Bureau of Agricultural Research (DA-BAR)

Collaborating Agencies

Philippine Council on Agriculture and Fisheries (PCA-F)  
Department of Agriculture and Fisheries - ARMM, Department of Agriculture Regional Field Office of Region IX, X, XI, XII and XIII (Caraga)  
Local Government Unit (LGU) of covered provinces and municipalities

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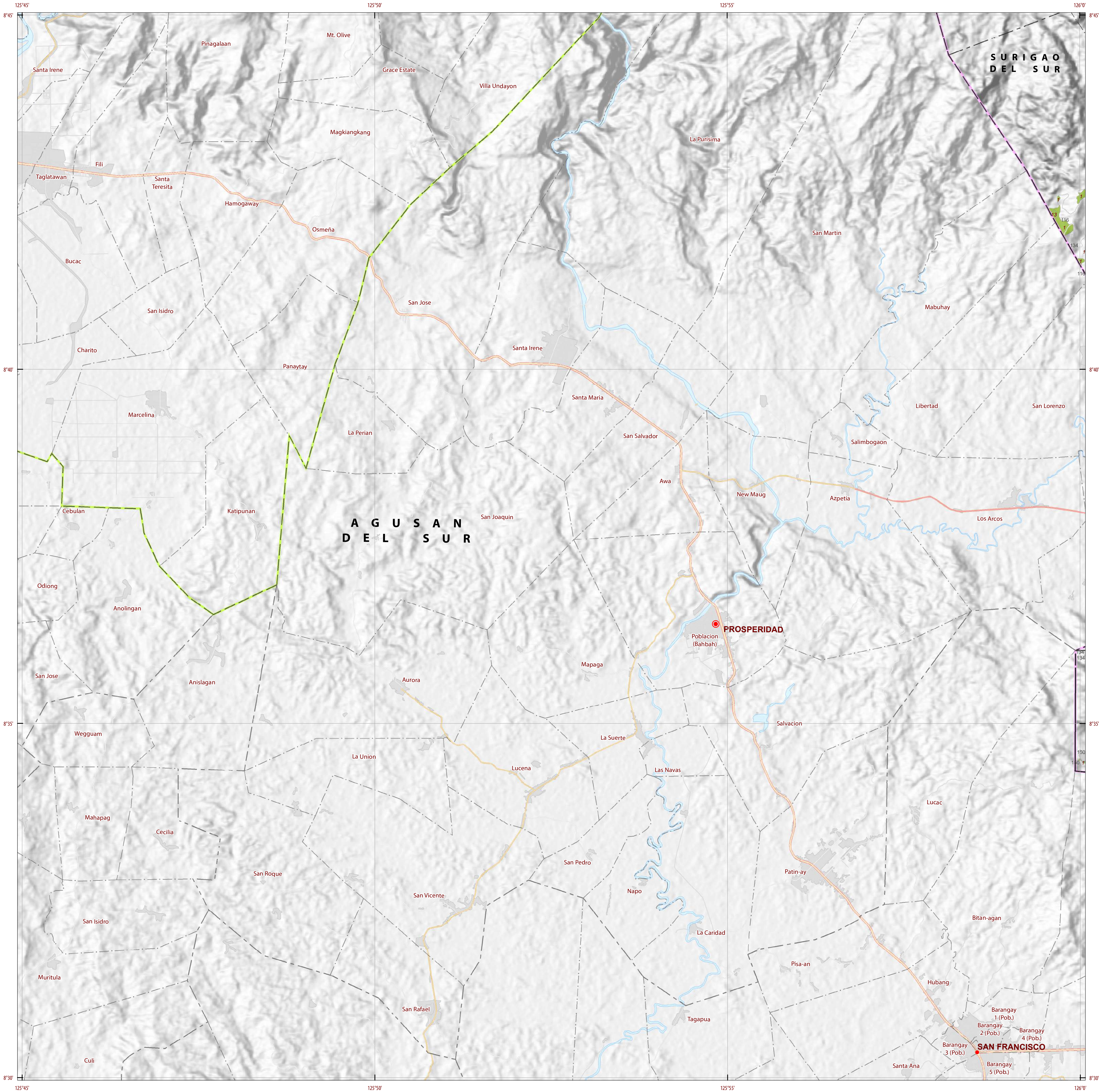
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Tel/Fax No. : (+632) 332-9534 E-mail: bswmcenter@da.gov.ph



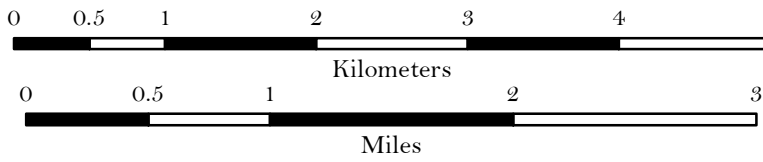


## LAND SUITABILITY MAP CACAO

### 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

- 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** - 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**

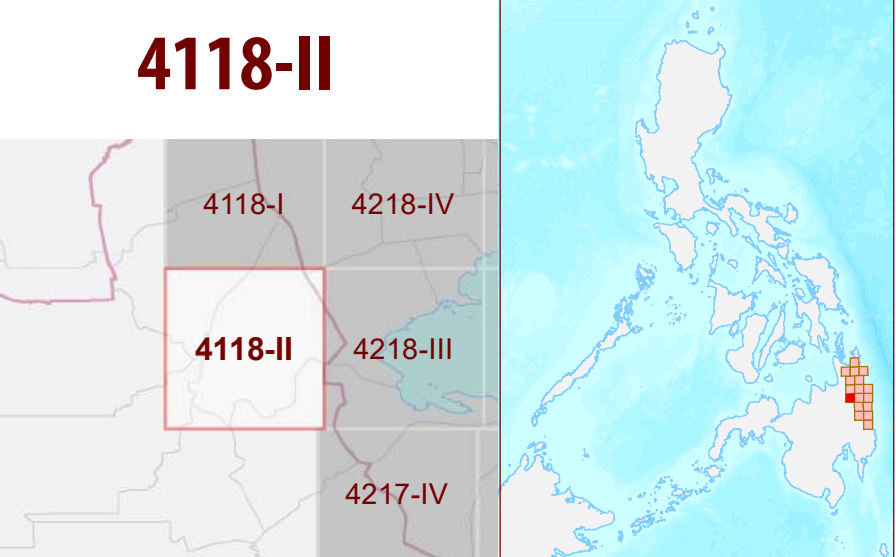
##### OTHER SIGNS

- 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



#### MISCELLANEOUS INFORMATION

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Project Leader : BERNARDO B. PASCUA  
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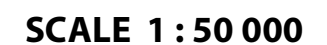
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## LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS



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

### SUITABILITY CLASSES

- ☐
- Not Suitable/ Not Relevant**

 NGP A

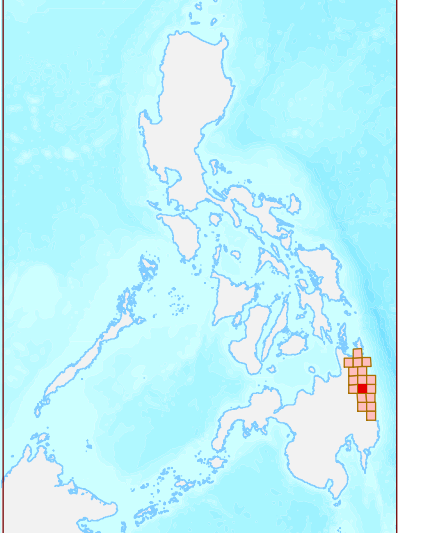
- 
- Cacao

## ROADS

- ## LAND USE

-  Built-up

## INDEX MAP



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GIS and Cartography :   IRVIN R. SAMALICA

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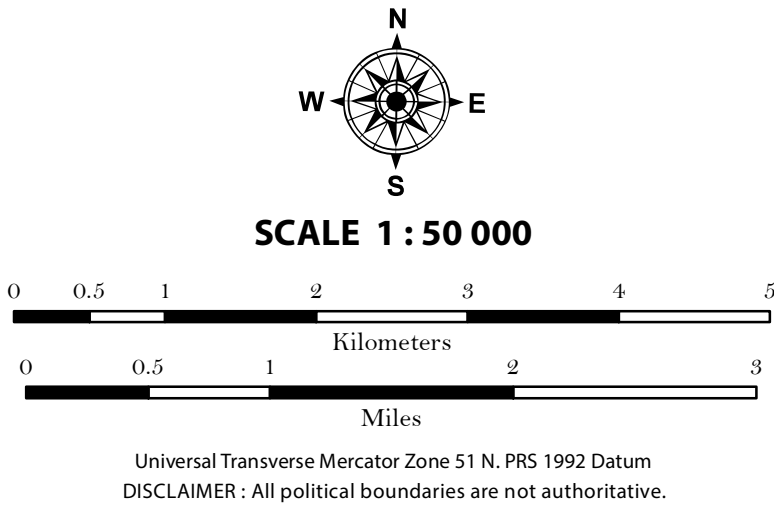
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LAND SUITABILITY MAP  
CACAO

LAND RESOURCES EVALUATION AND SUITABILITY  
ASSESSMENT OF STRATEGIC PRODUCTION AREAS



**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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- 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**

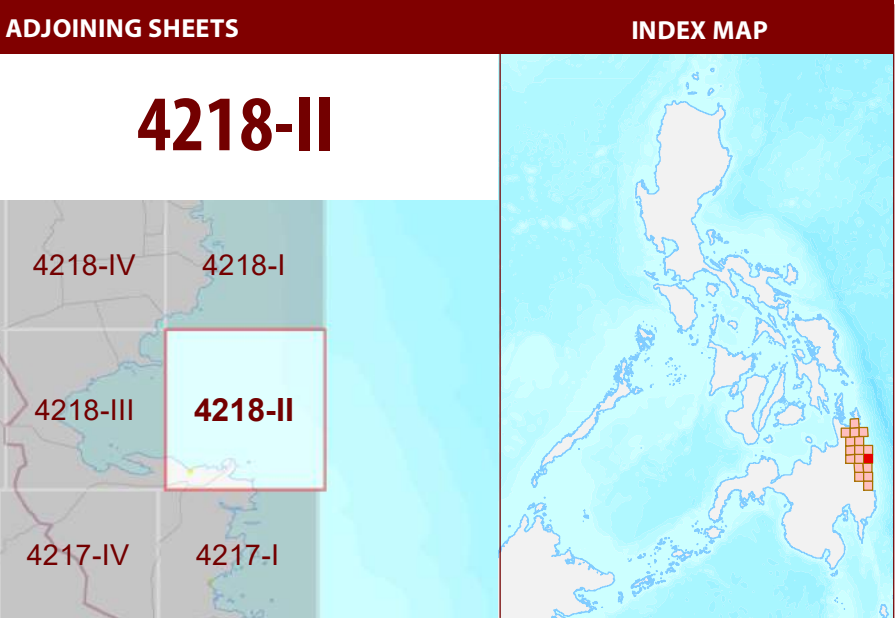
- Sea / Shoreline
- Lakes / Rivers

**PLACES**

- Capital City / City
- Capital Town / Town

**LAND USE**

- Built-up
- Fishpond
- Mangrove



**MISCELLANEOUS INFORMATION**

**SOURCES OF INFORMATION** : Topographic information taken from NAMRIA Topographic Map at 1:50,000 scale. Land resources information from the Agricultural Land Management and Evaluation Division (ALMED), Soils Survey Division (SSD) and Laboratory Services Division (LSD) of BSWM. Rice areas obtained from the Land Use System (FAO, 2015) and Philippine Rice Information System (PRISM) (IRRI, 2015). Data analysis and compilation through the **Land Resources Evaluation and Suitability Assessment of Strategic Production Areas for Major Commodities Project** implemented by BSWM (2017).

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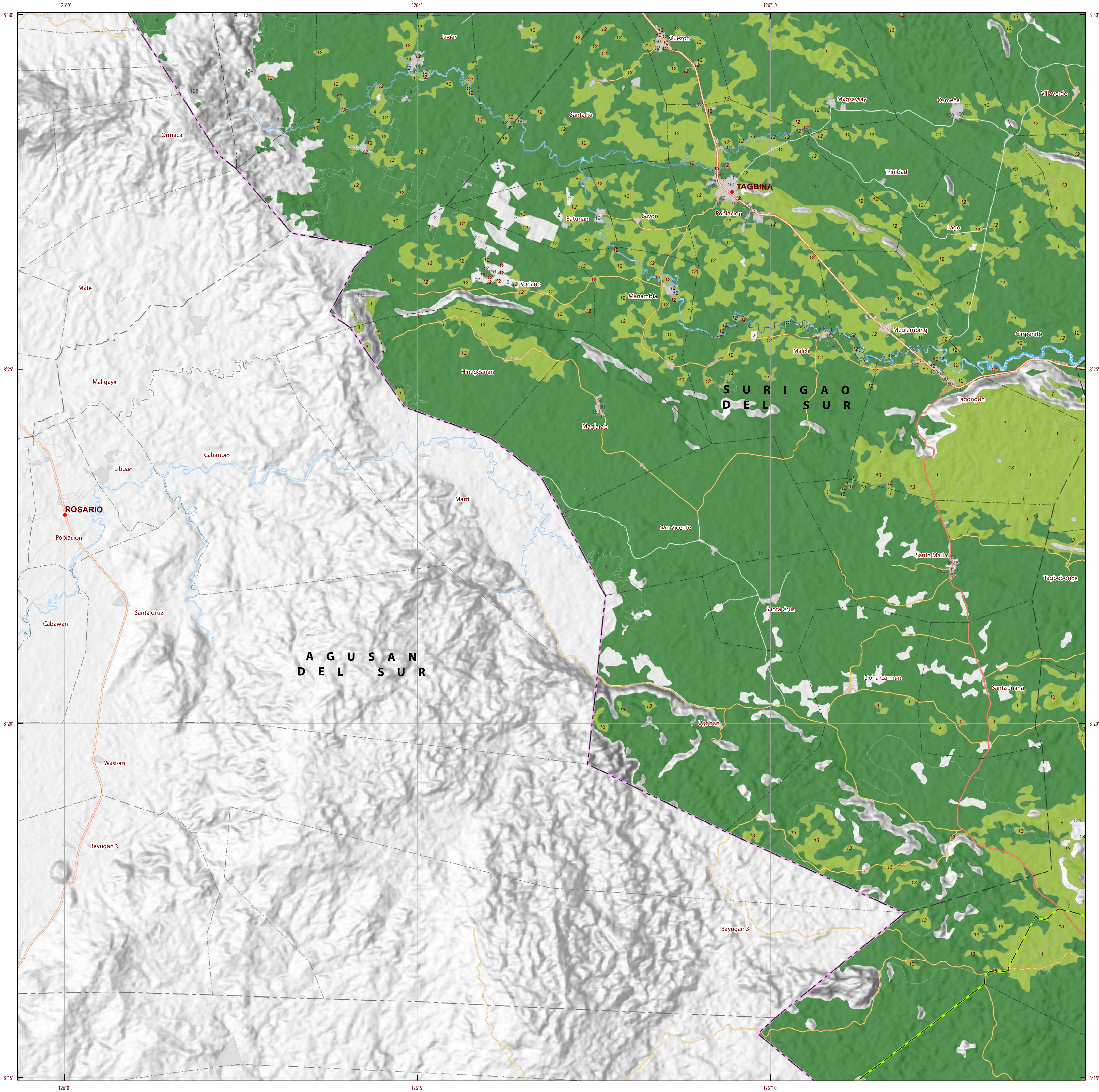
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PROVINCE OF SURIGAO DEL SUR Sheet 12 of 17 Sheet No. 4218-II





## LAND SUITABILITY MAP CACAO

### 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

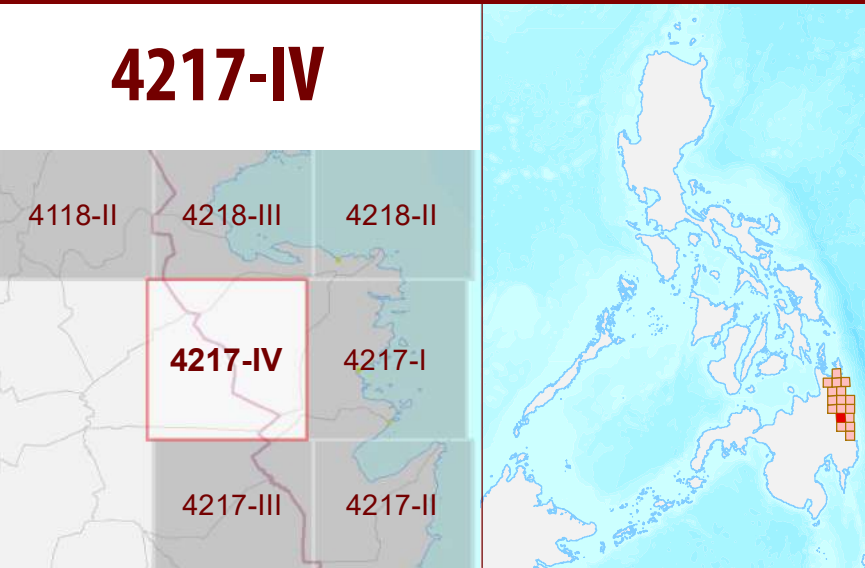
##### OTHER SIGNS

- NGP Areas
- 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



#### MISCELLANEOUS INFORMATION

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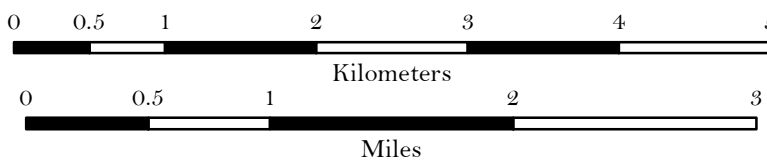


LAND SUITABILITY MAP  
CACAO

LAND RESOURCES EVALUATION AND SUITABILITY  
ASSESSMENT OF STRATEGIC PRODUCTION AREAS



SCALE 1 : 50 000



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LEGEND

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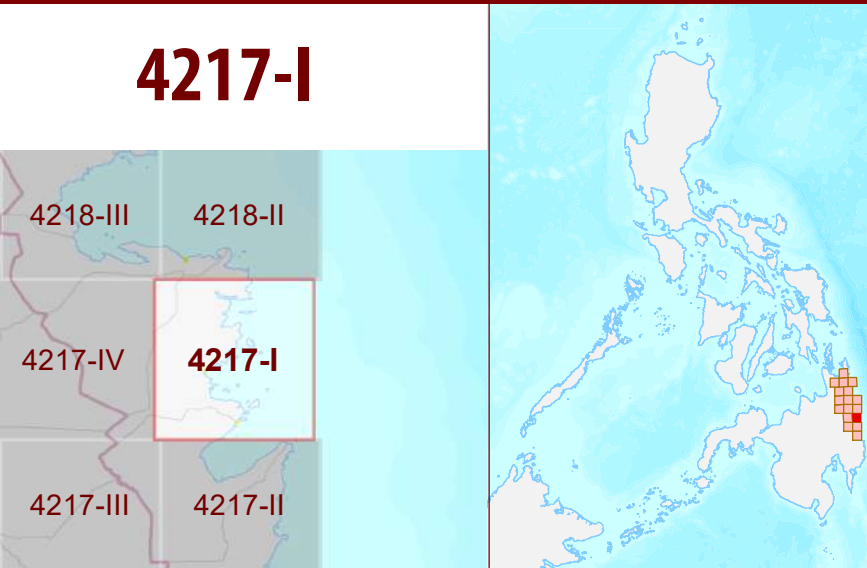
OTHER SIGNS

- NGP Areas
- 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



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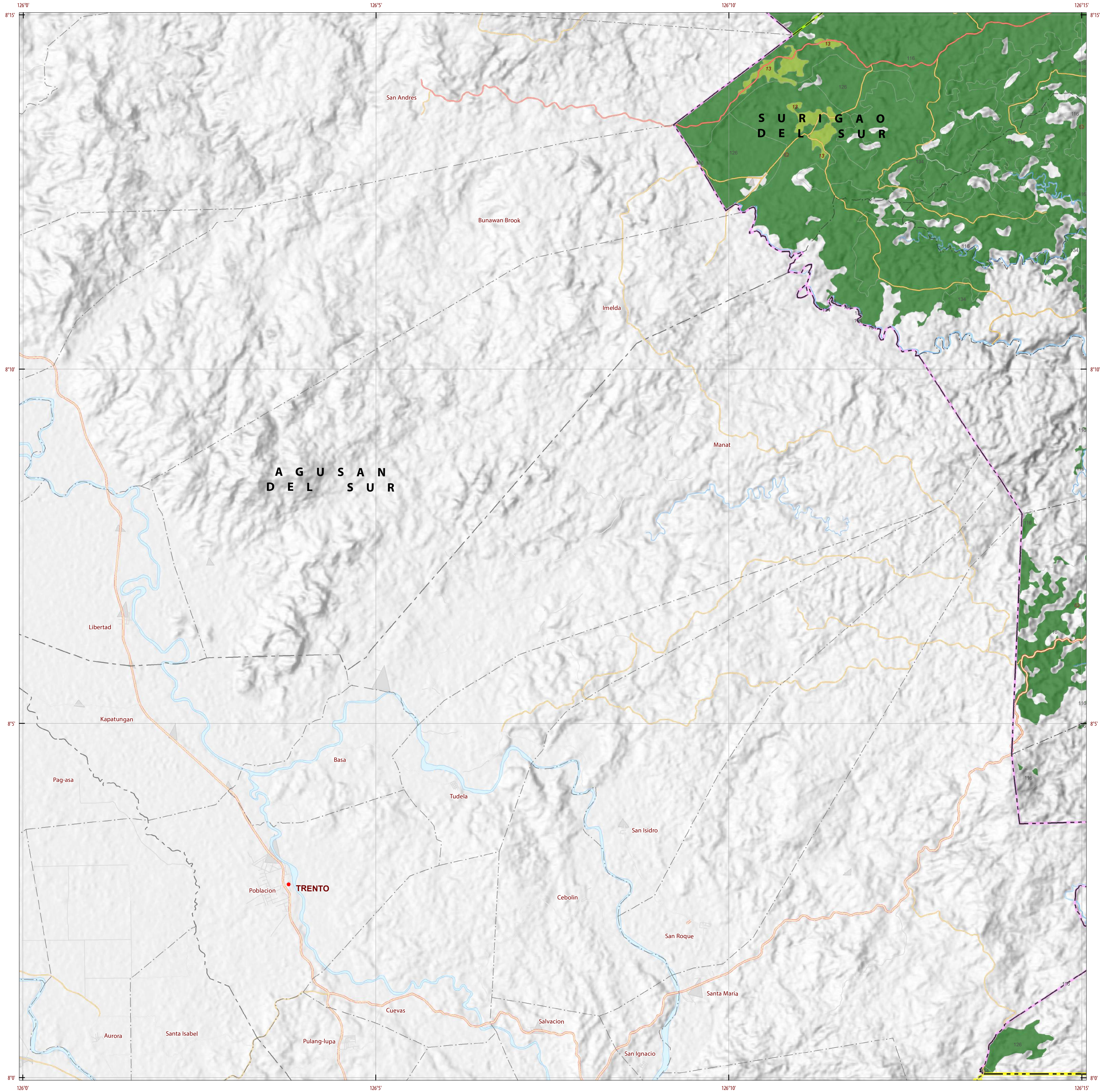
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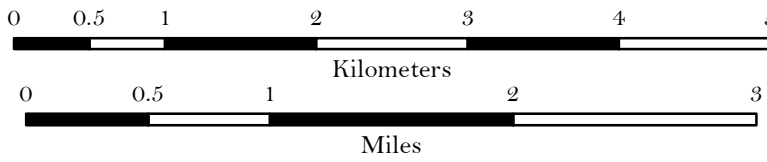


## LAND SUITABILITY MAP CACAO

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



SCALE 1 : 50 000



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#### LEGEND

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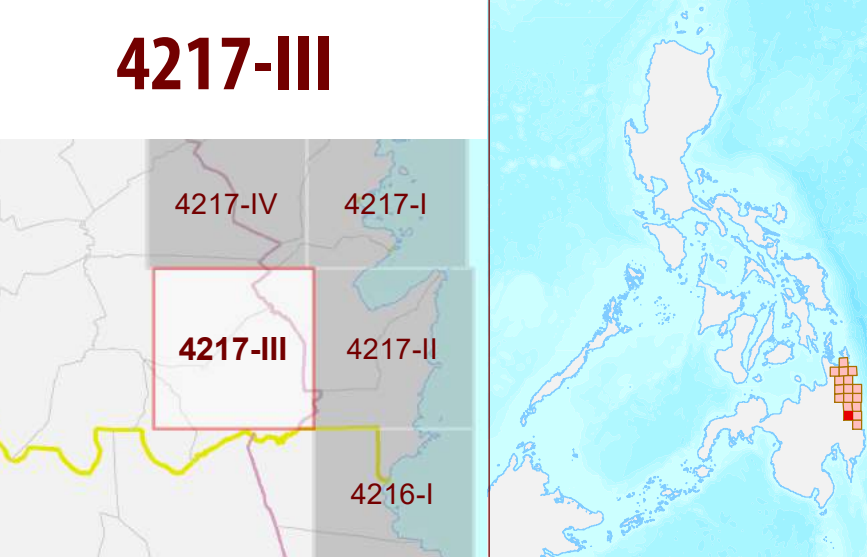
##### OTHER SIGNS

- NGP Areas
- Cacao
- Land limitation
- Land use

#### CONVENTIONAL SIGNS

- ROADS**
  - Expressway
  - Trunk line
  - Primary
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#### ADJOINING SHEETS



#### MISCELLANEOUS INFORMATION

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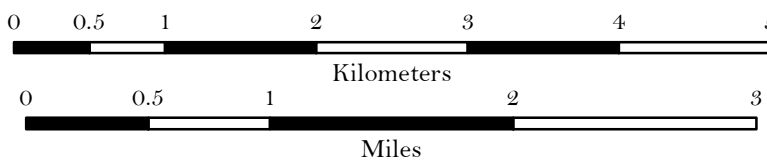


## LAND SUITABILITY MAP CACAO

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



SCALE 1 : 50 000



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#### LEGEND

##### SUITABILITY CLASSES

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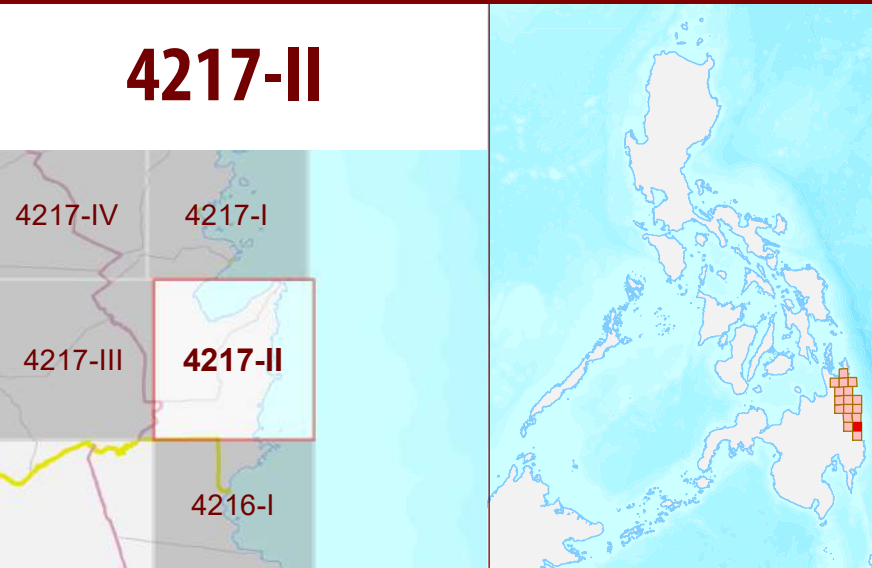
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#### ADJOINING SHEETS



#### MISCELLANEOUS INFORMATION

**SOURCES OF INFORMATION** : Topographic information taken from NAMRIA Topographic Map at 1:50,000 scale. Land resources information from the Agricultural Land Management and Evaluation Division (ALMED), Soils Survey Division (SSD) and Laboratory Services Division (LSD) of BSWM. Rice areas obtained from the Land Use System (FAO, 2015) and Philippine Rice Information System (PRISM) (IRRI, 2015). Data analysis and compilation through the **Land Resources Evaluation and Suitability Assessment of Strategic Production Areas for Major Commodities Project** implemented by BSWM (2017).

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GIS and Cartography : IRVIN K. SAMALCA  
Funding Agency : Department of Agriculture - Bureau of Agricultural Research (DA-BAR)  
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: Department of Agriculture and Fisheries - ARMM, Department of Agriculture Regional Field Office of Region IX, X, XI, XII and XIII (Caraga)  
: Local Government Unit (LGU) of covered provinces and municipalities

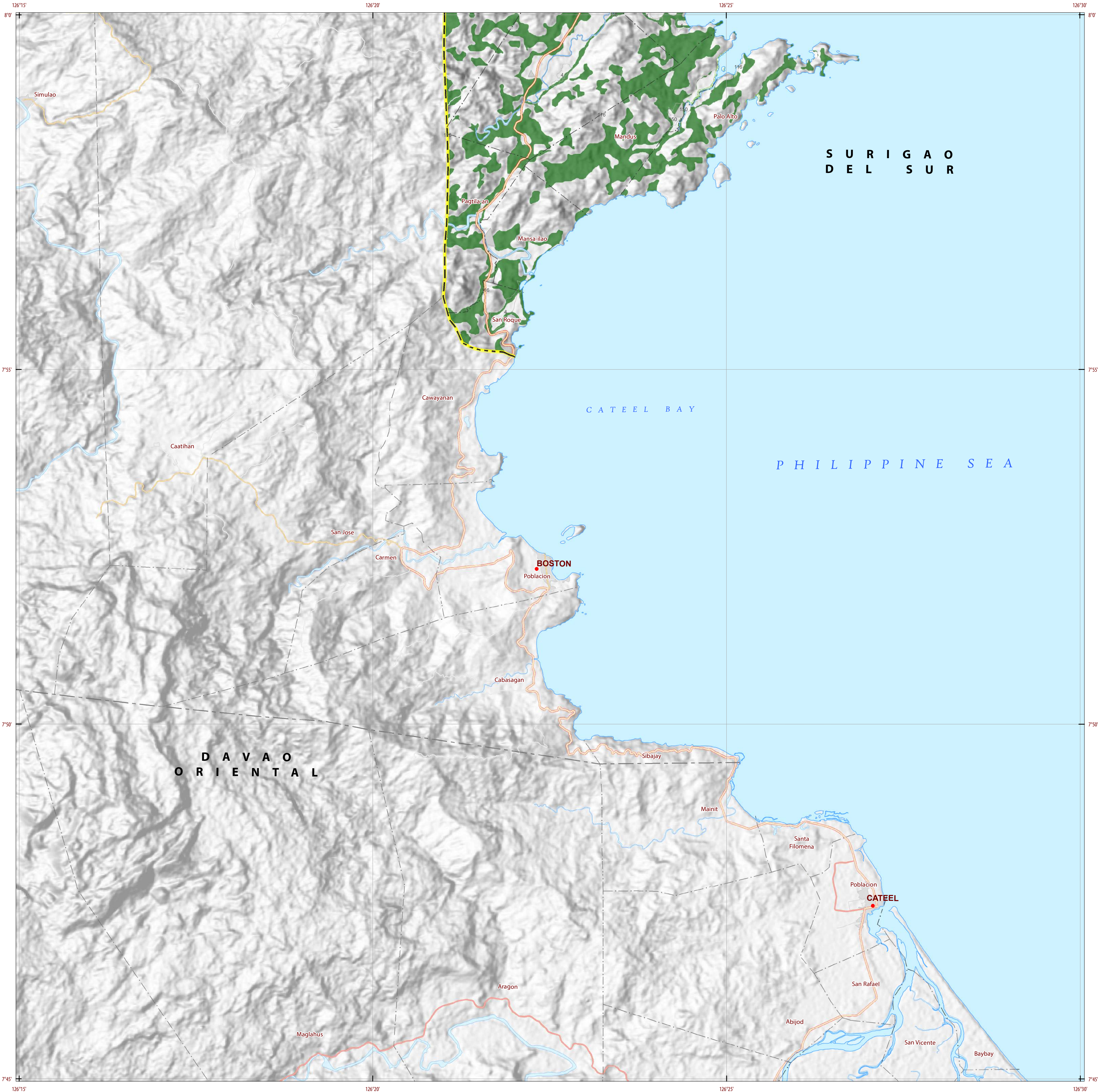
Map produced by the Geomatics and Soil Information Technology Division, Bureau of Soils and Water Management (BSWM). Users noting errors or omissions in this publication are requested to inform the Bureau of Soils and Water Management.






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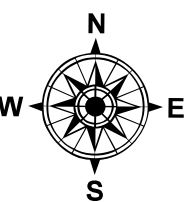








LAND SUITABILITY MAP  
CACAO

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

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

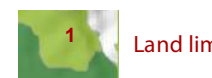
- Land having limitations which in aggregate are severe for sustained application of a given use and will so reduce productivity or benefits, or increase required inputs, that this expenditure will be only marginally justified.

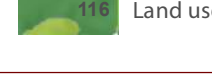
Not Suitable/ Not Relevant

OTHER SIGNS

 NGP Areas

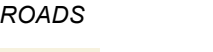
 Cacao


 Land limitation

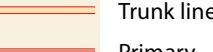
 Land use

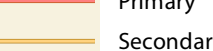
CONVENTIONAL SIGNS

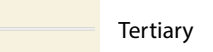
ROADS

 Expressway


 Trunk line


 Primary


 Secondary


 Tertiary

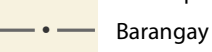
BOUNDARY

 Region


 Province

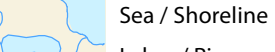
 District

 Municipality


 Barangay


HYDROLOGY

 Sea / Shoreline


 Lakes / Rivers


PLACES


 Capital City / City

 Capital Town / Town

LAND USE

 Built-up

 Fishpond

 Mangrove

ADJOINING SHEETS

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4217-II

4216-I

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PROVINCE OF SURIGAO DEL SUR

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