

# **LAND SUITABILITY MAP**

## **ROBUSTA, LIBERICA AND EXCELSA COFFEE**

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

### **PROVINCE OF MISAMIS OCCIDENTAL**



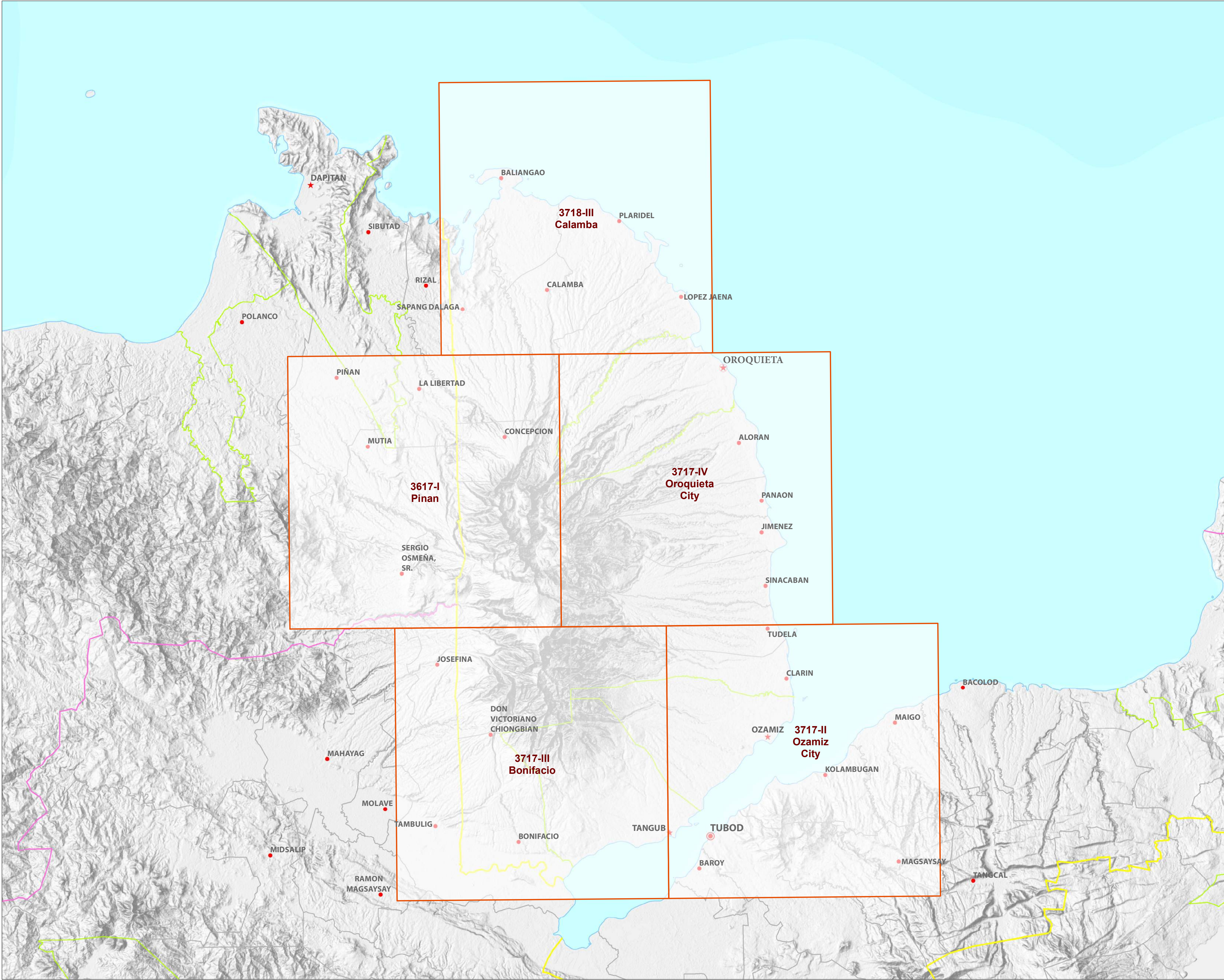
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# MAP INDEX

## LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS PROVINCE OF MISAMIS OCCIDENTAL



**LEGEND**

**Places**

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

**Administrative Boundary**

- Regional
- Provincial
- City
- Municipal

**Map Index**

- Index grid

**Topographic Relief**

**Bathymetry**



**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 ROBUSTA, LIBERICA AND EXCELSA COFFEE

## LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS MISAMIS OCCIDENTAL, REGION X

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

MUNICIPALITY	EXISTING COFFEE (Ha)			TOTAL EXISTING AREA (Ha)	EXPANSION AREA (Ha)						CONFLICT RESOLUTION (Ha)						TOTAL POTENTIAL EXPANSION AREA (Ha)
					Coconut		Shrubland, unmanaged*		Grassland, unmanaged*		Corn		Paddy rice, non-irrigated		Other crops		
	S1	S2	S3		S1	S2	S1	S2	S1	S2	S1	S2	S1	S2			
ALORAN	-	-	-	-	3,656	277	41	24	-	-	92	-	-	-	-	-	4,090
BALIANGAO	-	-	-	-	3,922	-	-	-	-	-	544	-	-	-	-	-	4,467
BONIFACIO	-	-	-	-	3,417	384	49	-	10	-	2,282	-	-	-	-	-	6,143
CALAMBA	1	-	-	1	4,236	106	-	-	489	4	164	-	-	-	-	-	5,000
CLARIN	-	-	-	-	2,942	17	-	3	43	24	252	22	-	-	-	-	3,302
CONCEPCION	-	-	-	-	101	536	-	-	94	246	6	786	-	-	-	-	1,770
DON VICTORIANO CHIONGBIAN	-	-	-	-	47	513	-	195	-	95	-	567	-	-	-	-	1,417
JIMENEZ	-	-	-	-	2,496	289	9	-	101	-	96	-	-	-	-	-	2,993
LOPEZ JAENA	-	-	-	-	6,899	132	49	-	35	-	275	5	-	-	-	-	7,395
OROQUIETA CITY	-	-	-	-	7,664	420	-	-	-	-	117	-	-	-	-	-	8,201
OZAMIS CITY	-	-	-	-	9,035	56	-	1	33	18	1,727	198	-	-	-	-	11,067
PANAON	-	-	-	-	2,317	138	-	-	-	-	88	-	-	-	-	-	2,544
PLARIDEL	1	-	-	1	4,919	58	-	-	-	-	1,038	8	-	-	-	-	6,024
SAPANG DALAGA	1	-	-	1	7,190	442	3	-	157	-	64	39	-	-	-	-	7,895
SINACABAN	-	-	-	-	3,475	532	-	-	45	89	32	-	-	-	-	-	4,174
TANGUB CITY	-	-	-	-	6,165	297	54	2	43	57	3,169	101	-	-	-	-	9,888
TUDELA	-	-	-	-	4,148	713	-	-	2	24	43	-	-	-	-	-	4,930
TOTAL	3	-	-	3	72,631	4,911	204	224	1,053	555	9,991	1,727	-	-	-	-	91,297

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.

### AGRONOMIC REQUIREMENT OF ROBUSTA, LIBERICA AND EXCELSA COFFEE PRODUCTION

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

#### SLOPE (%)

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

#### SOIL DRAINAGE

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

#### SOIL REACTION (pH)

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

#### SOIL TEXTURE

##### Coarse

S - sand  
LS - loamy sand  
CSL - coarse sandy loam  
SL - sandy loam

##### Medium

FSL - fine sandy loam  
L - loam  
SiL - silt loam  
CL - clay loam  
SiCL - silty clay loam  
SCL - sandy clay loam

##### Fine

SC - sandy clay  
SiC - silty clay  
C - clay  
HC - heavy clay

#### SOIL DEPTH (cm)

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

#### SURFACE IMPEDIMENT

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

### LAND LIMITATIONS DESCRIPTION AND COMBINATIONS

#### ELEVATION

EI2 - 1000m - 2000m  
EI3 - > 2000m

#### SOIL DRAINAGE

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

#### SOIL DEPTH

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

#### SOIL EROSION

E2 - Moderate erosion  
E3 - Severe erosion

#### SLOPE/TOPOGRAPHY

T2 - Undulating to moderately steep  
T3 - Steep to very steep

#### SOIL TEXTURE

Tc - Coarse texture

#### ROCK OUTCROPS

Rc2 - Common  
Rc3 - Many

#### FLOODING

F2 - Moderate seasonal flooding  
F3 - Severe seasonal flooding

CODE	LIMITATION	CODE	LIMITATION	CODE	LIMITATION	CODE	LIMITATION
1	E2-Sh2-Rc2	11	T2-E3-Rc2	21	T3-E3-Sh3-Rc2	31	T3-EI2-E3-Sh3-Rc3
2	EI2	12	T2-E3-Sh2-Rc2	22	T3-EI2	32	T3-EI3-E3-Sh3-Rc3
3	EI2-Sh2-Rc2	13	T2-E3-Sh2-Rc3	23	T3-EI2-E3-Sh3-Rc2	33	T3-EI3
4	EI3-Sh2-Rc2	14	T2-EI2	24	T3-EI3-E3-Sh3-Rc2	34	T3-EI3-F3-D2
5	F2-D2	15	T2-EI2-E3-Sh2-Rc2	25	T3-F3-D2		
6	F3-D2	16	T2-EI3-E3-Sh2-Rc2	26	T3		
7	Sh2	17	T2-F2-D2	27	T3-E3		
8	Sh2-Rc2	18	T2-F3-D2	28	T3-E3-Sh3-Rc3		
9	T2	19	T3	29	T3-EI2		
10	T2-E3	20	T3-E3	30	T3-EI2-E3		

CODE	LANDUSE
4	Corn
81	Coffee
82	Cacao
116	Coconut
126	Grassland
134	Shrubs, unmanaged
137	Rubber

### 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.

### CLIMATE TYPE

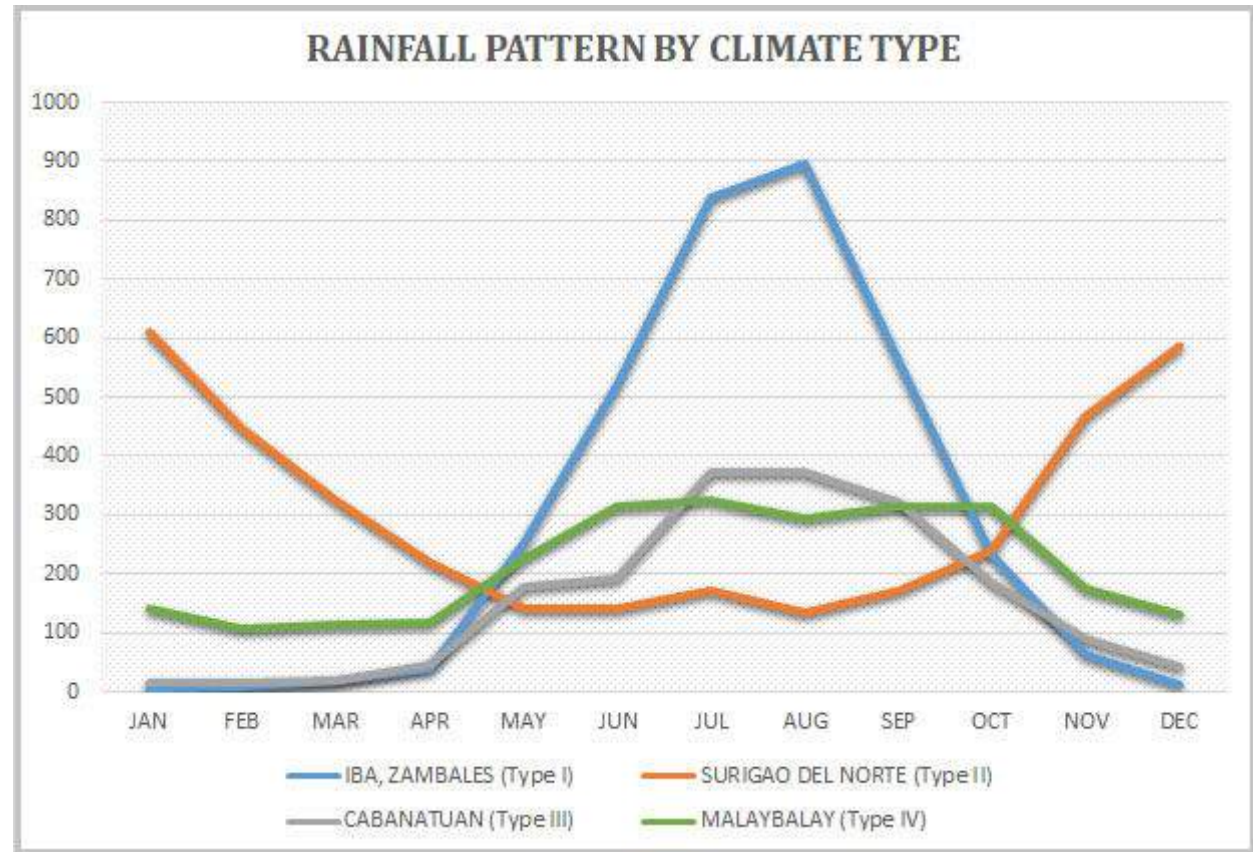
**TYPE I** : Two pronounced season, dry from November to April and wet during the rest of the year. Maximum rain period is from June to September

**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.

Almost whole part of Misamis Occidental classified as climatic Type III and small part in the Western side is climate Type IV.

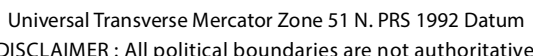
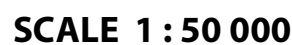


Source: PAGASA 2018, *Climatological Normals (Rainfall)*, Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), accessed 27 July 2018, <<https://www1.pagasa.dost.gov.ph/index.php/climate/climatological-normals>>.

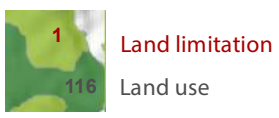





















## LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS



### SUITABILITY CLASSES

☐ Not Suitable/ Not Relevant NGP

## ROADS

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

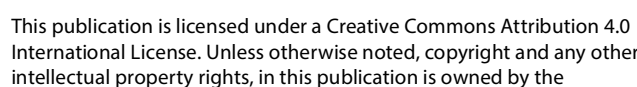
## INDEX MAP

**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 IRWIN. Data obtained from the Land Use System (PAQ, 2015) and Philippine Fisheries Information System (PFIS) and Data analysis and compilation from the **Land Resource 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)  
Collaborating Agencies :   Philippine Council on Agriculture and Fisheries (PCAP)  
                                  Department of Agriculture and Fisheries - ANR, Department of Agriculture Regional Office (DAR) Regions X, XI, XII and XIII (Caraga)  
                                  Local Government Unit (LGU) of covered provinces and municipalities

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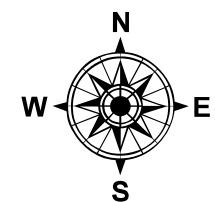


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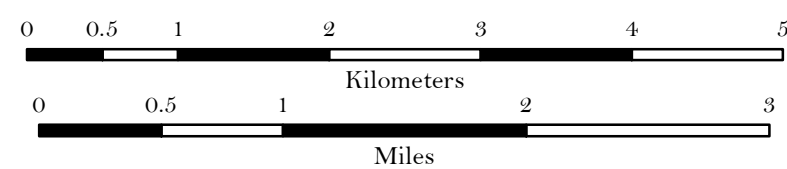
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## LAND RESOURCES EVALUATION AND SUITABILITY ASSESSMENT OF STRATEGIC PRODUCTION AREAS



**SCALE 1 : 50 000**



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

### LEGEND

### SUITABILITY CLASSES

- |    |  |
|----|--|
| S1 | <b>Highly Suitable</b> - 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 | <b>Moderately Suitable</b> - 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 application of a given use from the use, although still attractive, will be appreciably inferior to that expected on class S1 land. |
| S3 | <b>Marginally Suitable</b> - Land having limitations which in aggregate are severe for sustained application of a given use and will so reduce productivity or benefits, or increase required inputs, that this expenditure will be only marginally justified.   |

**Not Suitable/ Not Relevant**

### OTHER SIGNS

- 
 NGP Areas  
 Cacao
- 
 1 Land limitation  
 116 Land use

## CONVENTIONAL SIGNS

## ROADS

- Expressway
- Trunk line
- Primary
- Secondary
- Tertiary

**BOUNDARY**

- 
- Region
- Sea/Lake

## HYDROLOGY

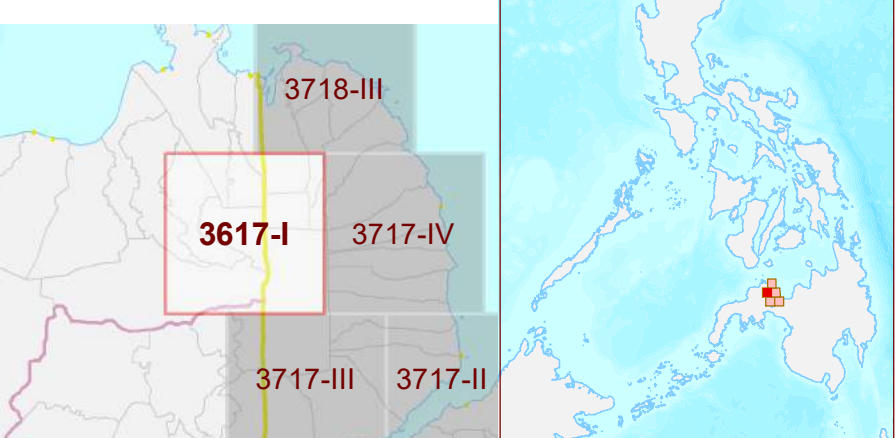
- Sea / Shoreline  
Lakes / Rivers
- PLACES**
- ★ ★ Capital City / City  
● ● Capital Town / Town

## LAND USE

-  Built-up  Fishpond  Mangrove

## ADJOINING SHEETS

# 3617-I




### MISCELLANEOUS INFORMATION

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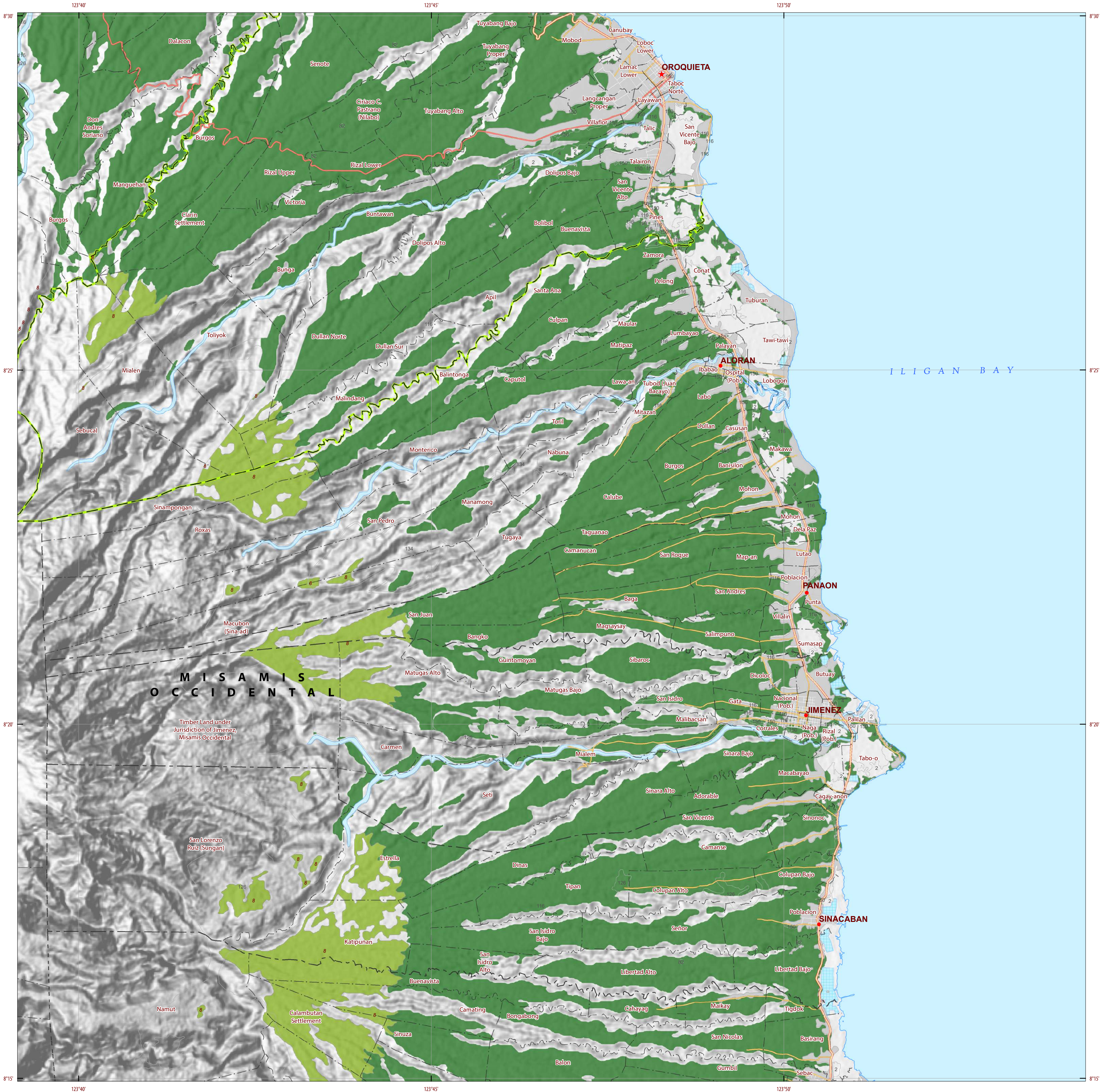
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PROVINCE OF MISAMIS OCCIDENTAL

Sheet 2 of 5      Sheet No. 3617-



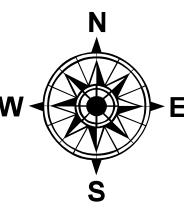




## LAND SUITABILITY MAP

### ROBUSTA, LIBERICA AND EXCELSA COFFEE

#### 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  
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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


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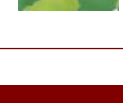
**Not Suitable/ Not Relevant**

**OTHER SIGNS**

 NGP Areas

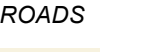
 Cacao


 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**

3718-III

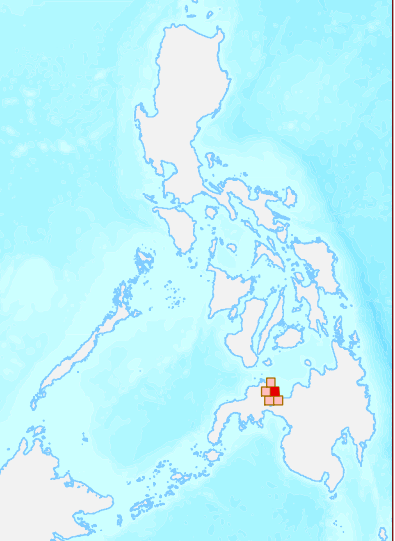
3617-I

**3717-IV**

3717-III

3717-II

**INDEX MAP**



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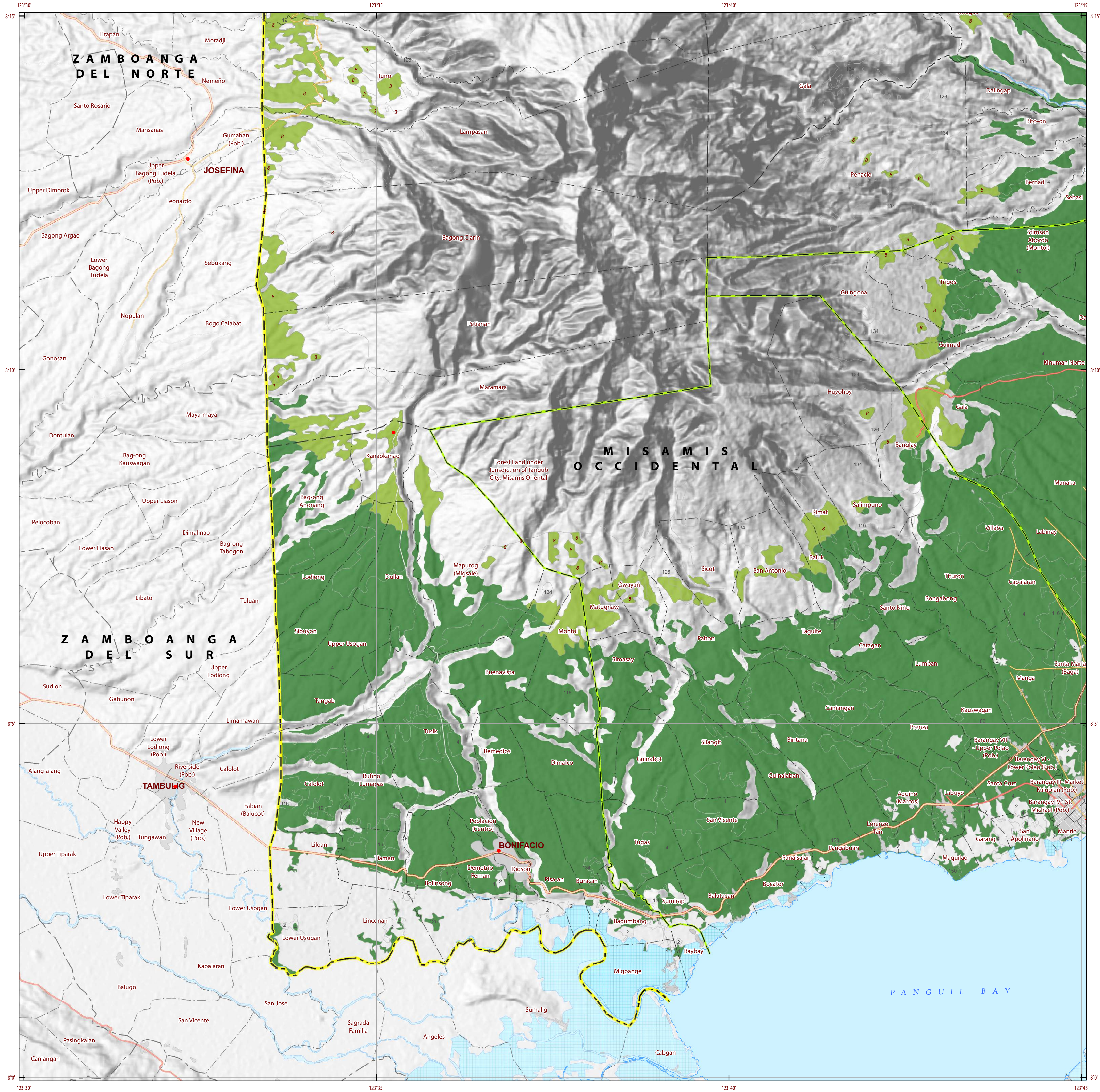
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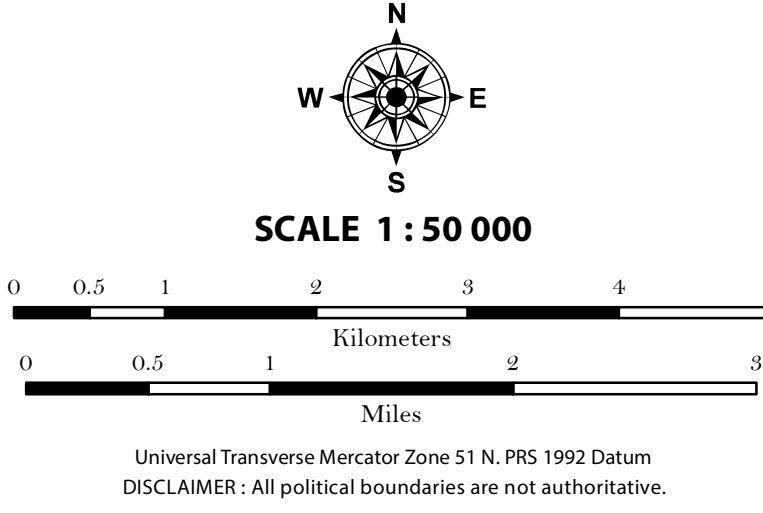
**REPUBLIC OF THE PHILIPPINES**  
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# LAND SUITABILITY MAP ROBUSTA, LIBERICA AND EXCELSA COFFEE

## 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**

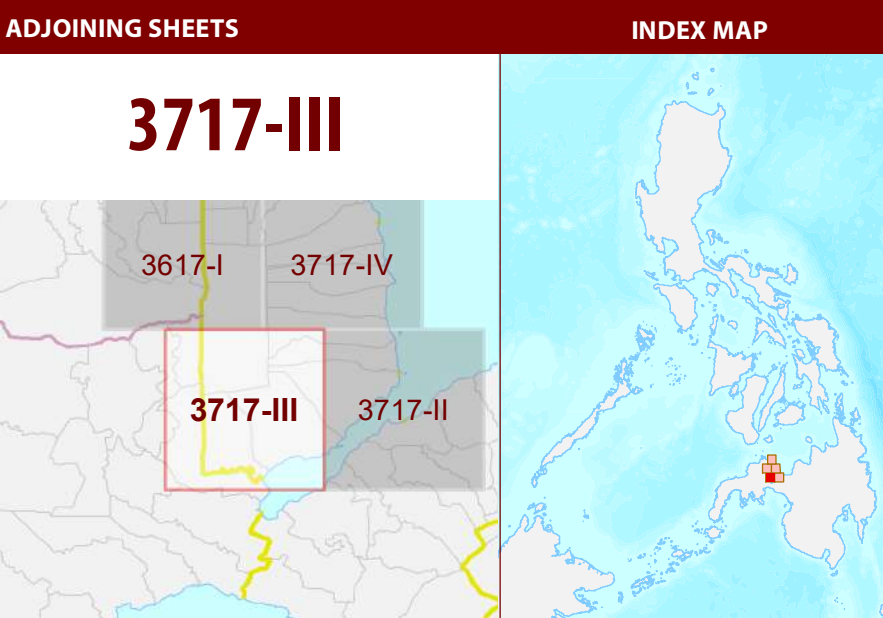
- Sea / Shoreline
- Lakes / Rivers

**PLACES**

- Capital City / City
- Capital Town / Town

**LAND USE**

- Built-up
- Fishpond
- Mangrove



**MISCELLANEOUS INFORMATION**

**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)  
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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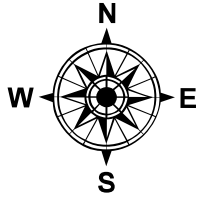
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LAND SUITABILITY MAP  
ROBUSTA, LIBERICA  
AND EXCELSA COFFEE

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

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Built-up  
Fishpond  
Mangrove

ADJOINING SHEETS

3717-II

3617-I 3717-IV

3717-III

INDEX MAP



MISCELLANEOUS INFORMATION

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