Mindanao Rainforestation:
Ensuring Food and Water Security for the Philippines

Presented by

Hineleban Foundation

Flow of Presentation

- The Philippine Context
- Mindanao Opportunity
- Framework Methodology
- Results of Cost-Benefit Analysis
- Role of Forests in Carbon Sequestration
- Key Success Factors
- Hineleban Experience

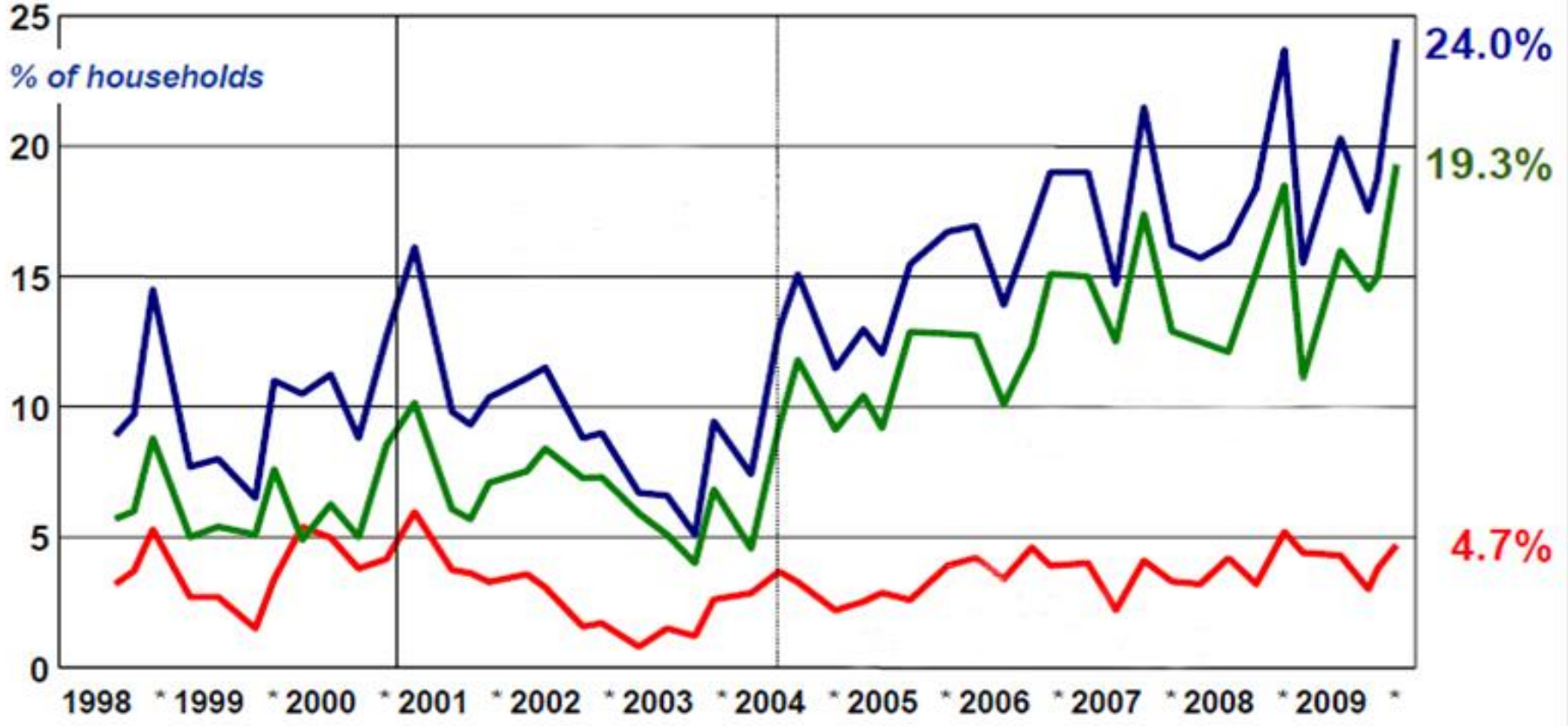
hineleban foundation

Hineleban (hĕ-nē-leu-bän)

“ The Mother Tree of the forest that sustains the cycle of all life. ”

The Provincial Consultative Body for The Indigenous People which represents the seven Tribes of Bukidnon granted the exclusive use of this Sacred Binukid Word as the name of our Foundation

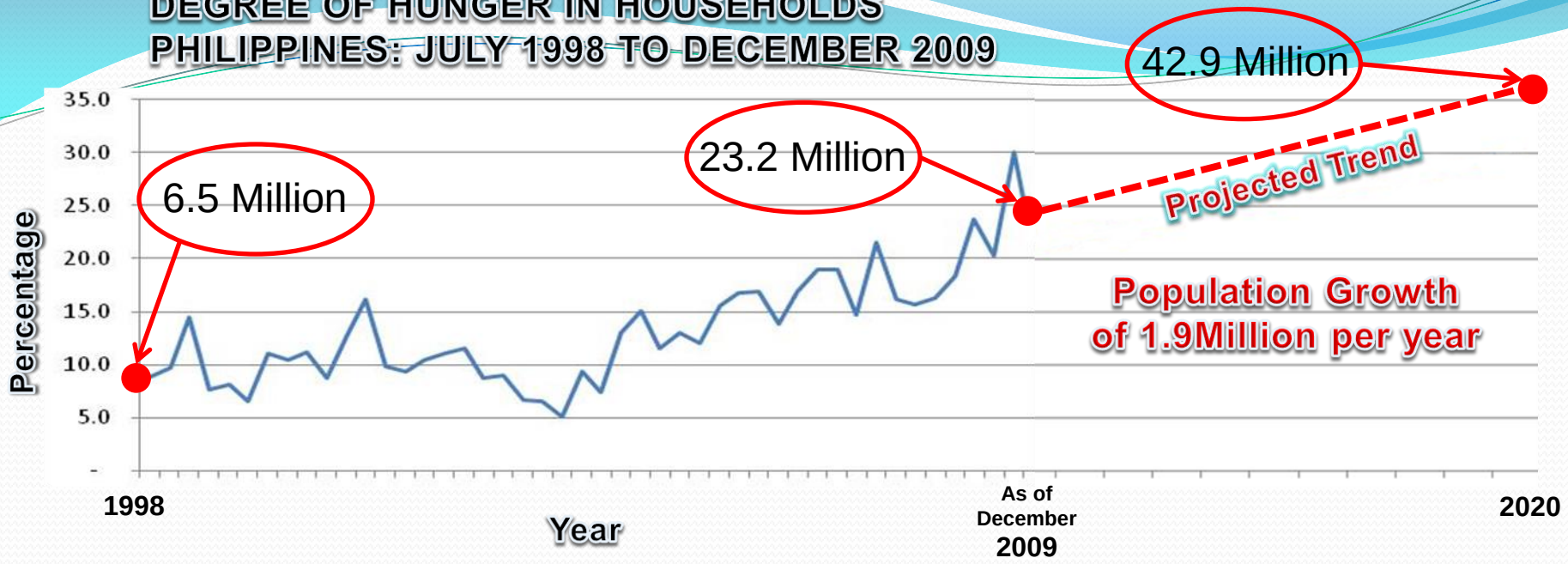
DEGREE OF HUNGER IN HOUSEHOLDS, PHILIPPINES, JUL 1998 - DEC 2009



Note: Don't Know and Refused responses are not shown.
Q: Nitong nakaraang 3 buwan, nangyari po ba kahit minsan na ang inyong pamilya ay nakaranas ng gutom at wala kayong makain? KUNG OO: Nangyari po ba 'yan ng MINSAN LAMANG, MGA ILANG BESES, MADALAS, o PALAGI?

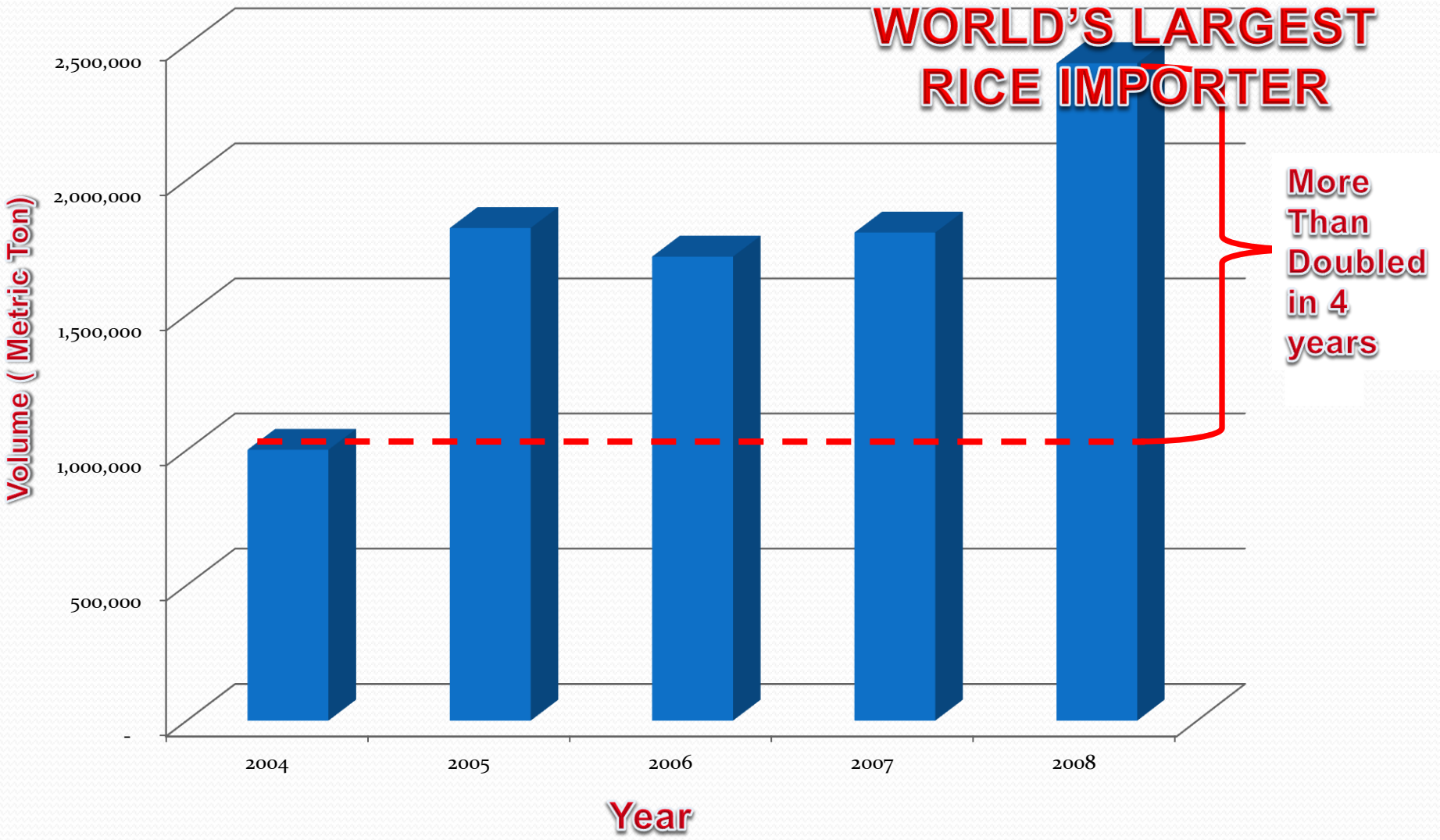
FEATURED IN BUSINESS WORLD, January 12, 2010

DEGREE OF HUNGER IN HOUSEHOLDS PHILIPPINES: JULY 1998 TO DECEMBER 2009



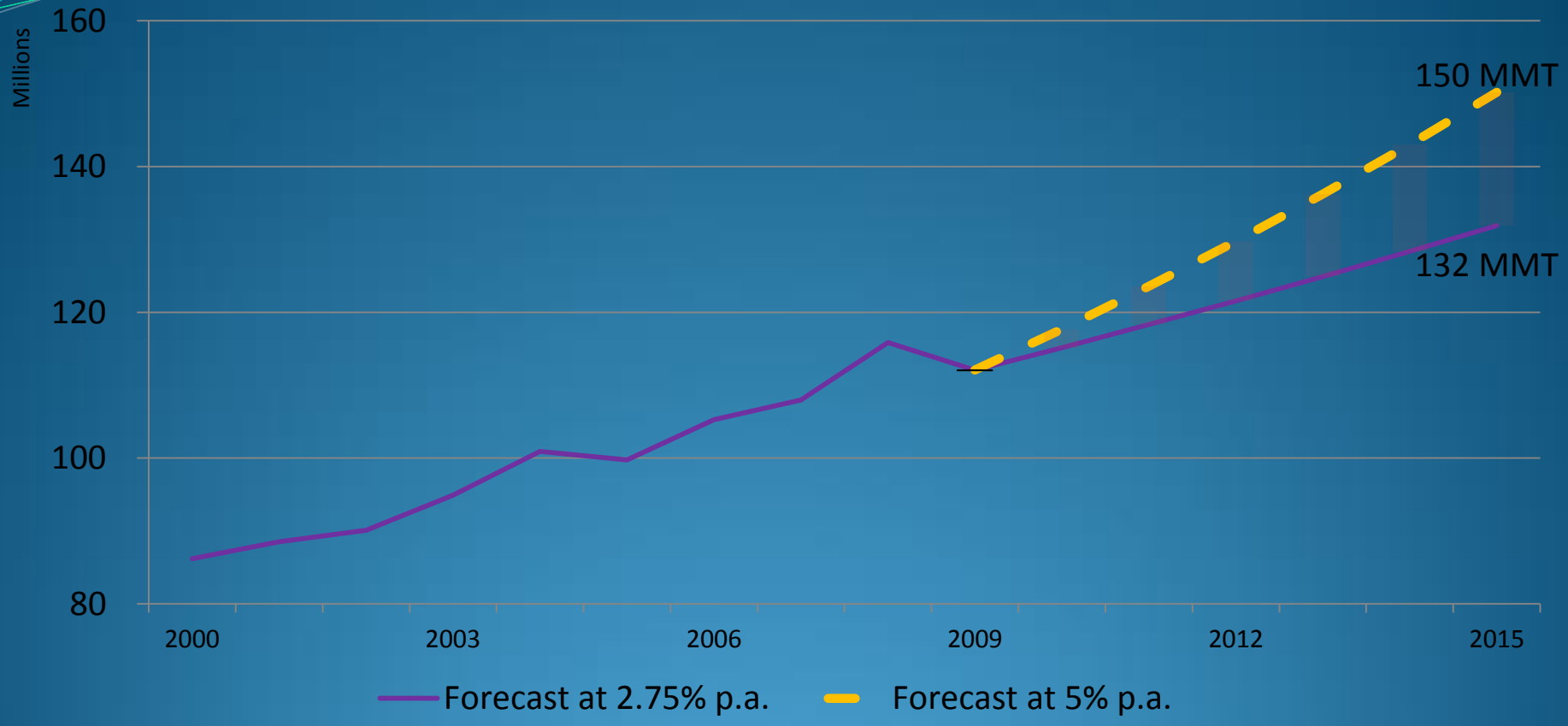
Year	Total Population	Hunger Percentage
1998	73M	8.90%
2009	97M	24.00%
2020	116M	37.00%

PHILIPPINE RICE IMPORTS



Source: DA

Philippine Agriculture Sector Production: Current vs. Required



The Executive Director of the IFPRI estimated that the Philippine agriculture sector needs to grow 5% p.a. from 2010 to 2015 to cut rural poverty and hunger.

Source: Bureau of Agricultural Statistics

THE DECLINE OF
Philippine Primary Forest Cover

Reference: Philippine Forest book

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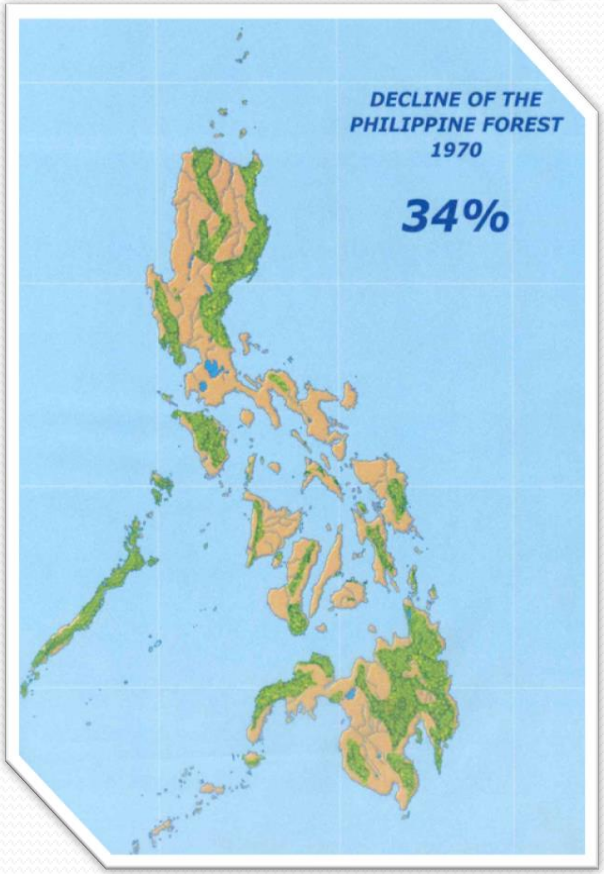
70%

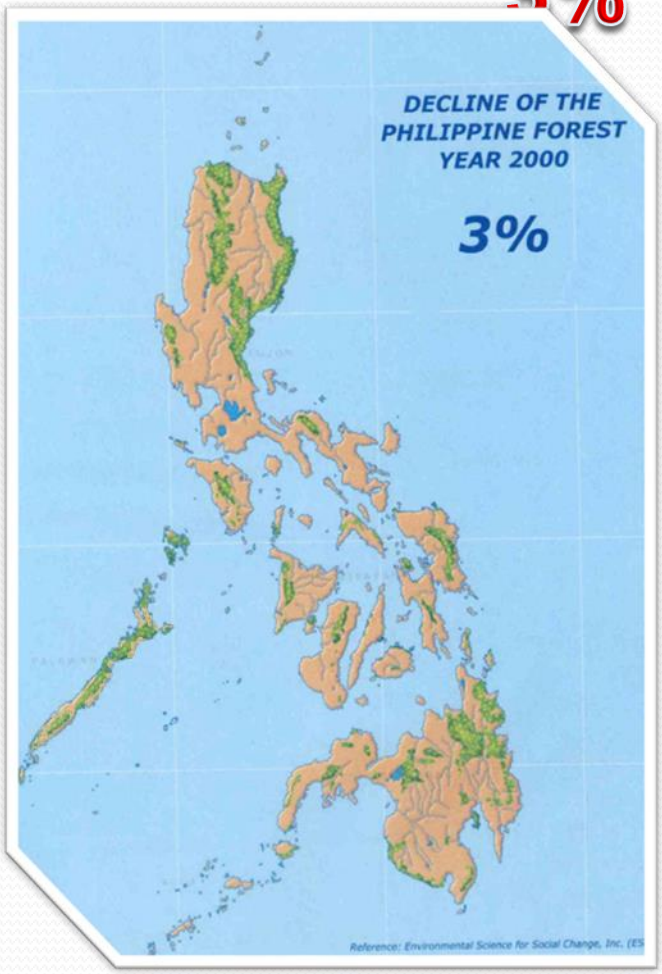
1900

34%



1970

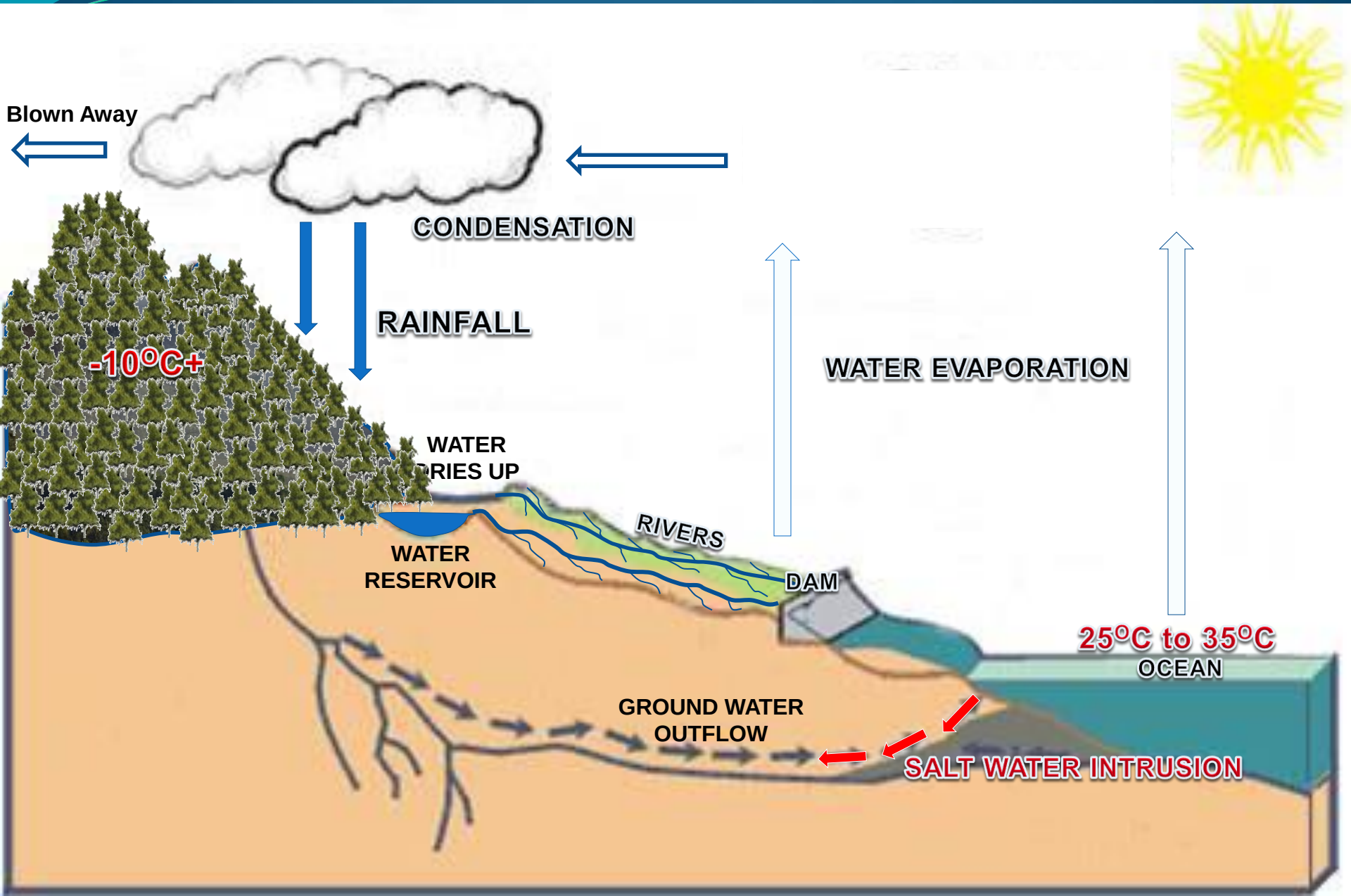
3%



2000

100 YEARS OF MASSIVE LOGGING ACTIVITY

Hydrological Cycle and Effects on the Watershed



FLOODING in LOW LAND FARM COMMUNITIES

FLOODING in CITIES

PULANGI DAM

EROSION OF BARREN MOUNTAINSIDES CAUSES:

SILTATION OF DAMS/LAKES

DEATH TO CORAL REEFS

DRASTIC REDUCTION OF FISH CATCH

RAINFALL DECLINE as EVIDENCED by LOSS OF RIVER WATER DISCHARGE

DURING THE DRY SEASON

AVERAGE DISCHARGE OF WATER BASE ON ACTUAL READING

YEAR	AGUSAN RIVER Average (Q=LPS)	KUMAYKAY RIVER Average (Q=LPS)
1955 to 1989	1,923.60	1,603.00
2001 to 2005	487.33	393.67

Decrease of water discharge

75 % Over the last 30 years

KUMAYKAY RIVER

AGUSAN RIVER

Reference: Data from NIA Region 10

THE MAJOR LONG TERM EFFECT OF THE LOSS OF FOREST COVER IS:

- DECLINE IN EVENLY DISTRIBUTED RAINFALL
- EXTENDED DRY SEASONS - 5 MONTHS IN LUZON
- DRYING UP OF RIVERS CRITICAL FOR IRRIGATION
- LACK OF REPLENISHMENT OF POTABLE WATER
- REDUCED RESERVOIR CAP. FOR HYDRO ENERGY

- When we already experience 24% hunger today, and have millions unemployed
- When we are adding 19 million people in 10 yrs & 38 Million people in 20 yrs
- When Luzon can no longer feed itself

IS THERE ANY HOPE FOR OUR COUNTRY?

MINDANAO Can be part of the SOLUTION.

POPULATION DENSITY

Luzon 442 per sq.km.

Mindanao 221 per sq. km. = 50%

MINDANAO's Contribution Today

- Situated outside the typhoon belt, Mindanao enjoys a favorable production climate throughout the year.
- Grows most of the Philippines' major crops: rubber (100%), pineapple (91%), export banana (100%), corn, sugar, palm oil, and coconut (50%)
- The above mentioned crops account for over 40 percent of the Philippines' food requirements – Today.

But Mindanao still has vast under-utilized lands waiting for development.

Challenge of Mindanao

- Despite abundant resources, there has been no perceptible improvement in the quality of life; Mindanao is the poorest island in the country.

- Interventions are needed to alleviate poverty by introducing innovative, yet culturally sensitive approaches for sustainable development.

  - *when there are more economic activities, more income-generating opportunities, more food on the table, there will always be higher levels of peaceful co-existence.*

SECURE THE WATERSHEDS OF MINDANAO, TO PROVIDE:

- Rainfall for rainfed food production
- Rivers for irrigated agriculture
- Supply of drinking water
- Hydroelectric power generation
- Response to the challenge of climate change

INVEST IN THE PROTECTION AND REGENERATION OF OUR FORESTS

RAINFORESTATION

To know how to regenerate our forests sustainably, we first need to understand……

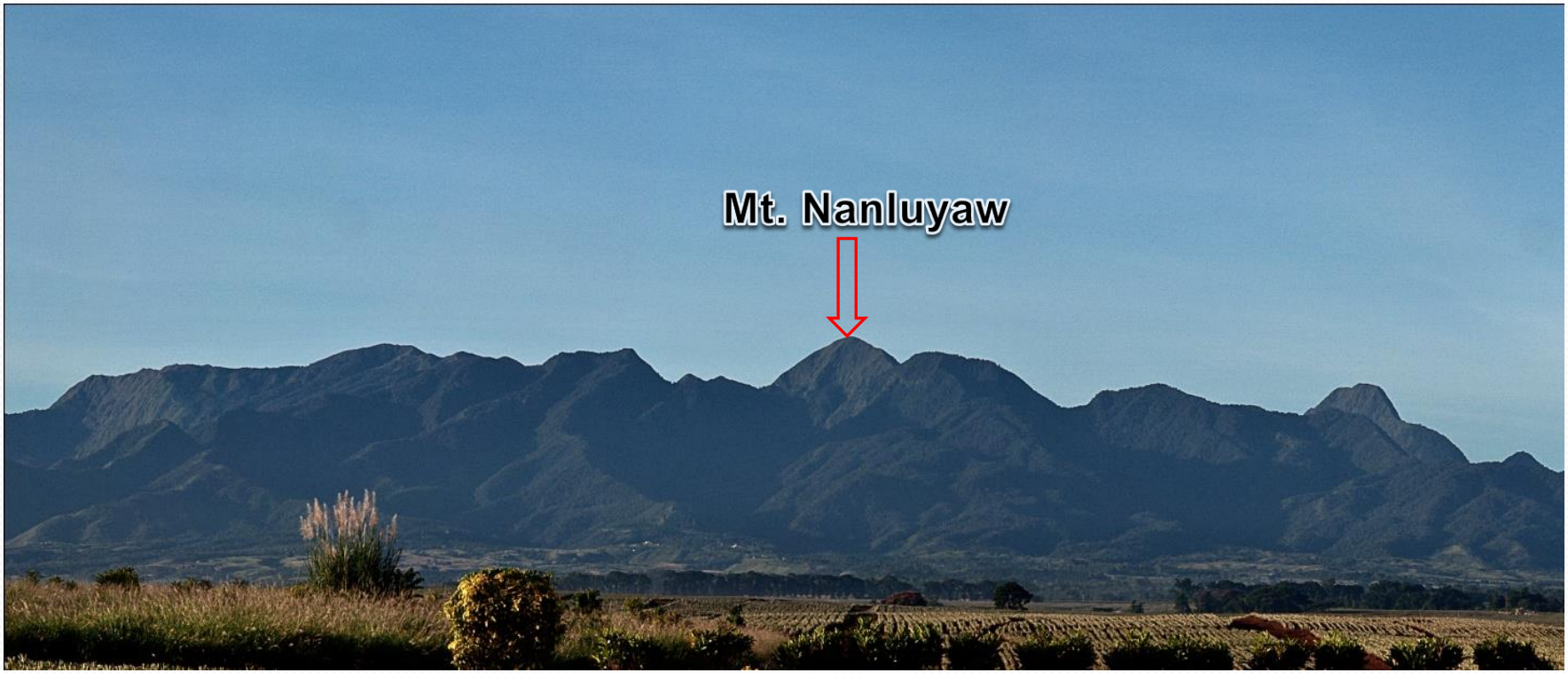
How did we lose our Forests?

UP TO 1980'S – MASSIVE LOGGING

SOME LOST DUE TO KAINGIN...


MAJOR LOSS DUE TO GRASS FIRES
COGON & TALAHIB GRASS

KITANGLAD MOUNTAIN RANGE



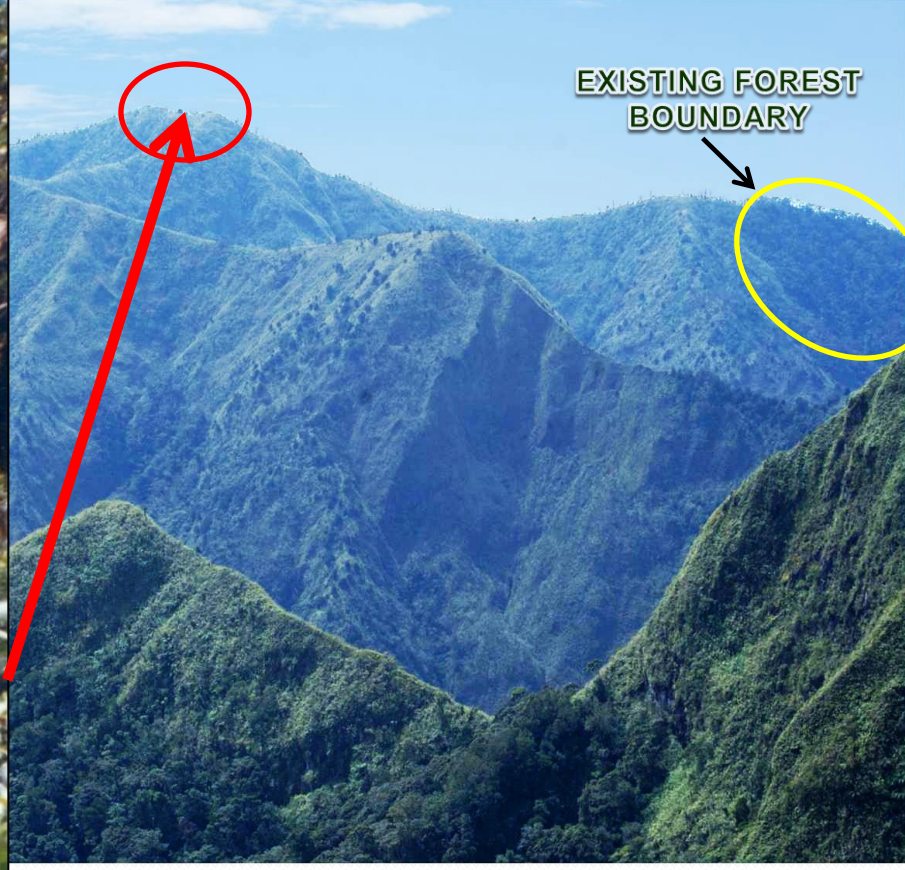
COMPARATIVE RECORD OF TREE COVER

Year 1980

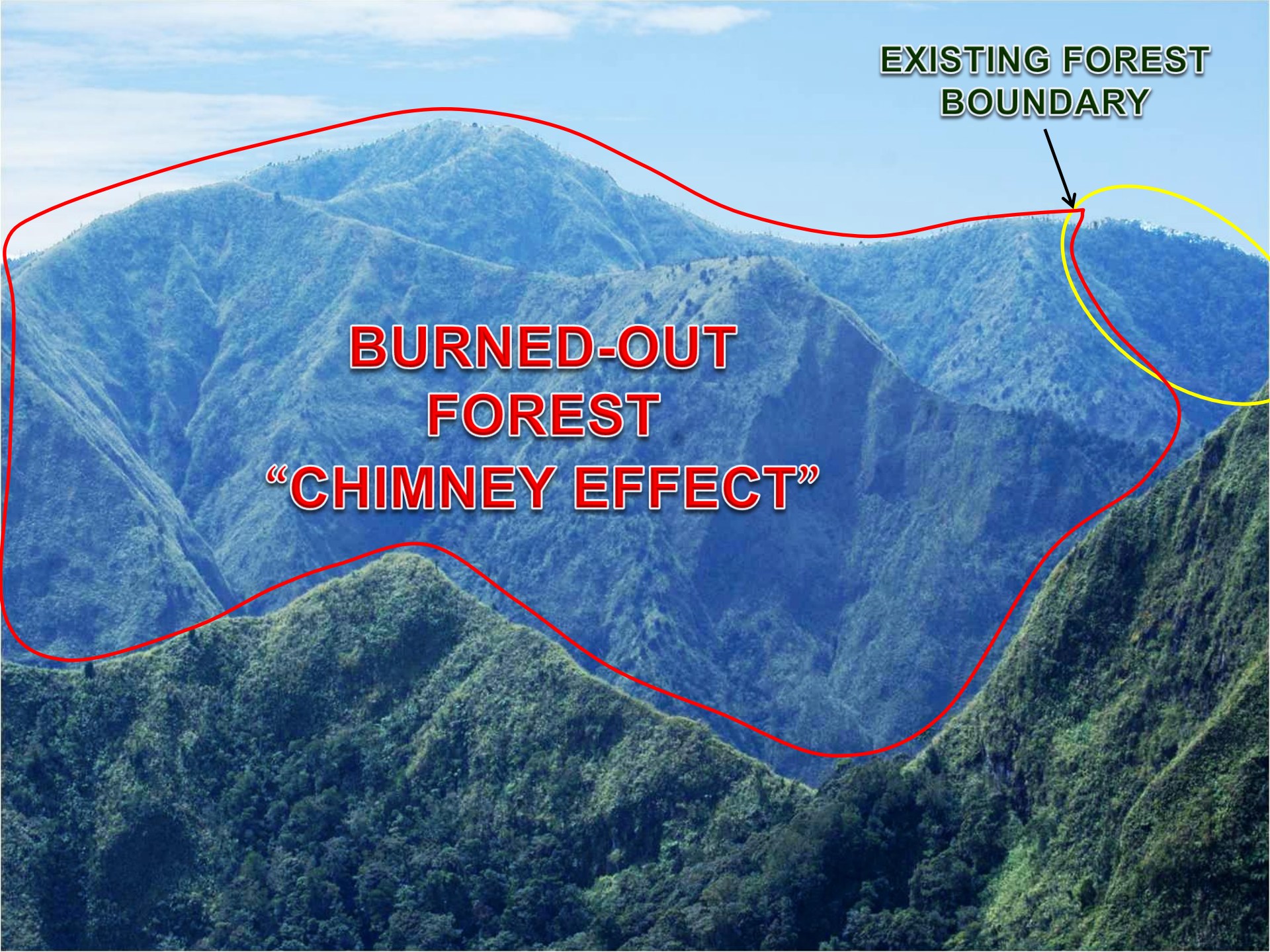
Two (2) Climbers

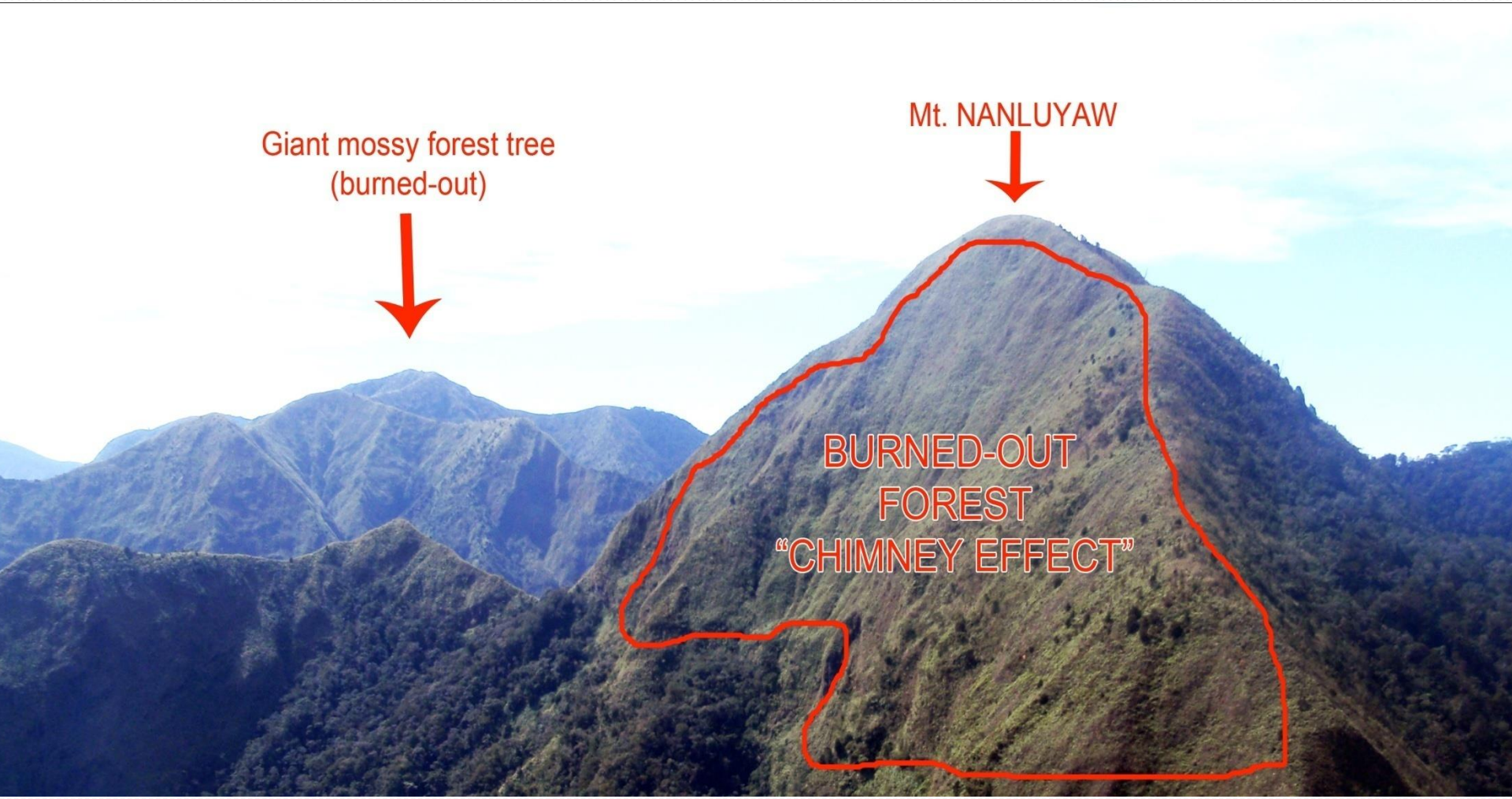
Year 2009

Year 1980



Year 2009

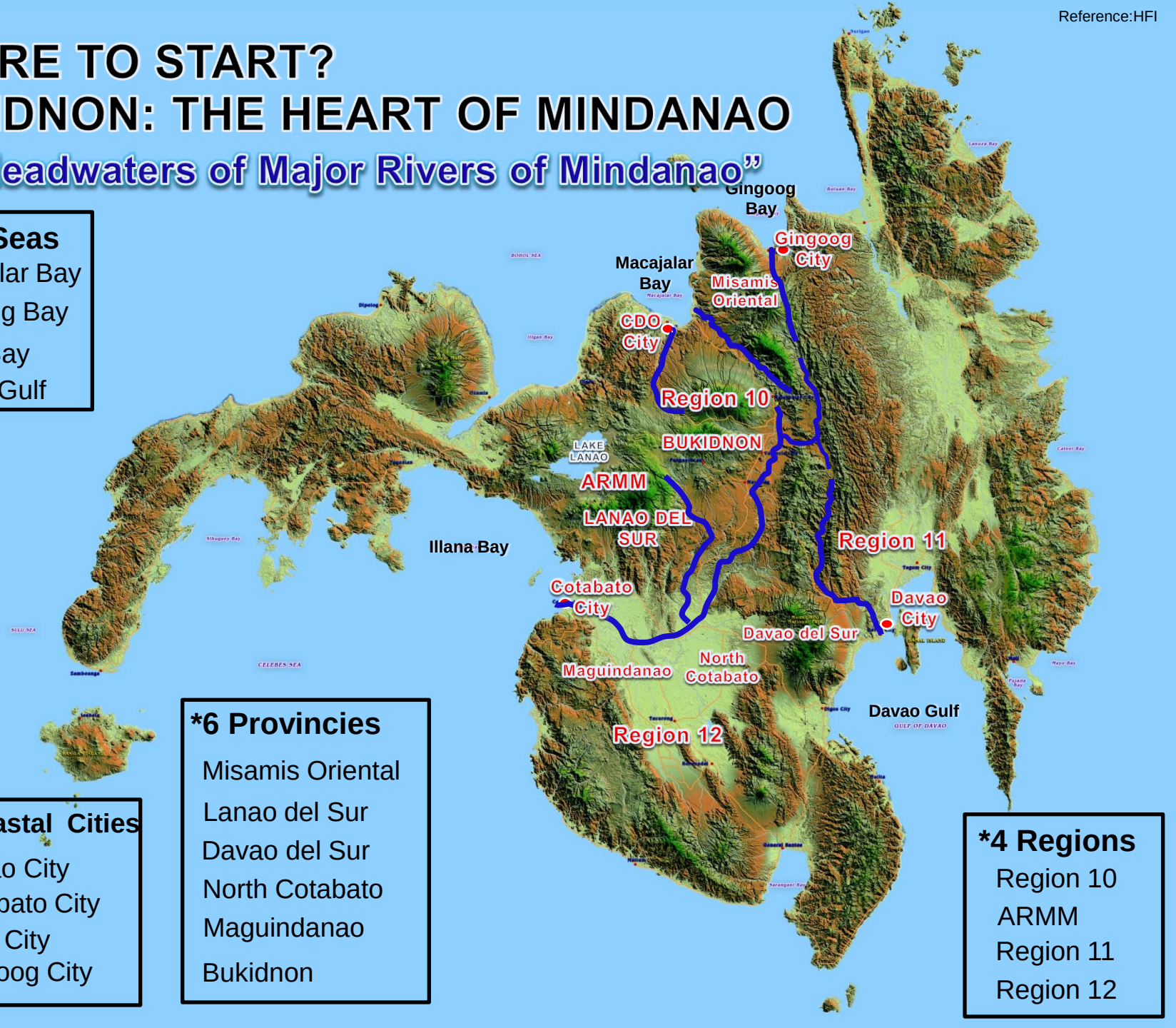

EXISTING FOREST
BOUNDARY
BURNED-OUT
FOREST
"CHIMNEY EFFECT"


Giant mossy forest tree
(burned-out)
Mt. NANLUYAW
BURNED-OUT
FOREST
"CHIMNEY EFFECT"

Reference:HFI

WHERE TO START?
BUKIDNON: THE HEART OF MINDANAO

"The Headwaters of Major Rivers of Mindanao"



***4 Big Seas**

- Macajalar Bay
- Gingoog Bay
- Illana Bay
- Davao Gulf

*** 4 Coastal Cities**

- Davao City
- Cotabato City
- CDO City
- Gingoog City

***6 Provincies**

- Misamis Oriental
- Lanao del Sur
- Davao del Sur
- North Cotabato
- Maguindanao
- Bukidnon

***4 Regions**

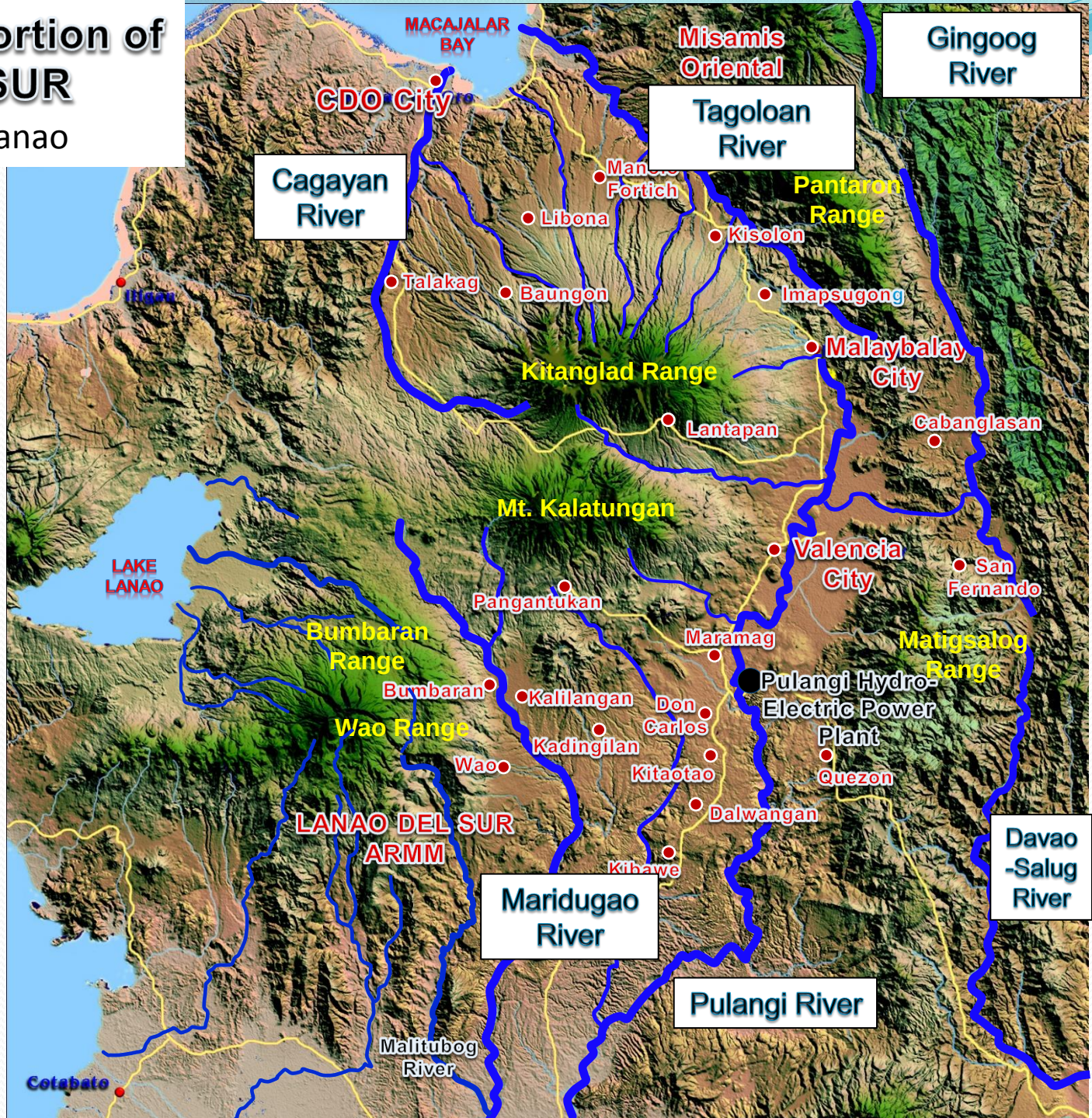
- Region 10
- ARMM
- Region 11
- Region 12

BUKIDNON and Portion of LANAO DEL SUR

The Heart of Mindanao

Has 6 BIG River systems:

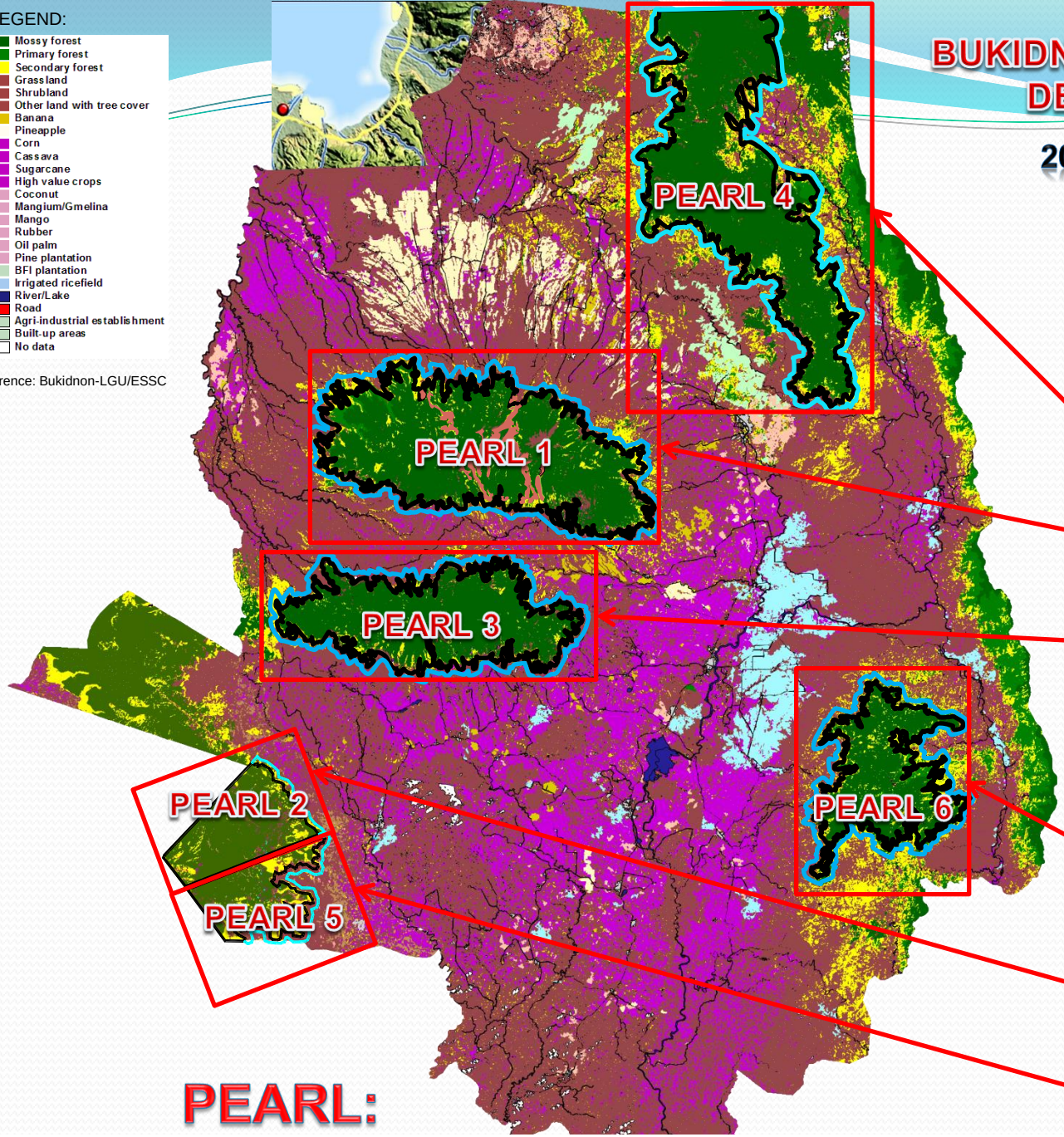
1. Cagayan River
2. Tagoloan River
3. Pulangi River
   to Rio Grande River
4. Maridugao River
   to Rio Grande River
5. Davao-Salug River
6. Gingoog River



Reference: HFI

BUKIDNON and Portion of LANAO DEL SUR LAND COVER

2005 - 2007 REMOTE SENSING



ONLY REMAINING PRIMARY FOREST

6 CRITICAL SITES:

- PANTARON RANGE
- KITANGLAD MOUNTAIN RANGE
- Mt. KALATUNGAN
- MATIGSALOG RANGE
- BUMBARAN RANGE
- WAO RANGE

PEARL:

Program for Equitable Advancement of Rural Livelihoods

PEARL Prioritization Criteria

- Enlightened Leadership (champions at the local and provincial levels)
- Easy Wins (scientific knowledge and Hineleban ‘s ground presence)
- Maximize impact on total forested area and corresponding watershed service areas.
- Extent of Deforestation and Degradation (state of watershed and mossy forests)
- Potential for Partnerships and Resource Mobilization (community relations, existing partners and possible funding sources)

Key features of PEARL's 1 &2

- **Potable Water Impact** on Cagayan de Oro (sole source) and for city of Malaybalay and seven municipalities of Bukidnon;
- **Hydroelectric Power** plant on Pulangi (Kitanglad) and Lake Lanao / Agus (Bumbaran)
- **Food Production Impact** as both sites cover vast areas for rainfed and irrigated agriculture
- **Ecological Significance and Impact** thru the reduction of siltation from the mountain ranges to the coast (ridge to rivers to reefs)

SUMMARY OF LAND COVER

PROGRAM FOR EQUITABLE ADVANCEMENT and RURAL LIVELIHOODS

LOCATION	AREA (HECTARES)					
	PRIMARY FOREST	SECONDARY FOREST	TOTAL EXISTING FOREST (Primary Forest + 50% of Secondary Forest)	GRASSLAND/ SHRUBLAND/ Other Land with Tree Cover (Less than 20% Tree Cover)	TOTAL	PROSPECT AREA FOR TREE PLANTING (50% of Secondary Forest + Total Grassland/Shrubland/ Other land with tree cover)
	above and below 1,000 meters above sea level	with 40% to 60% tree cover				
PEARL 1 - KITANGLAD RANGE	36,596.00	1,944.00	37,568.00	12,144.00	50,684.00	13,116.00
PEARL 2 - BUMBARAN RANGE	9,497.00	1,221.00	10,107.50	3,058.00	13,776.00	3,668.50
PEARL 3 - MT. KALATUNGAN	22,100.00	938.00	22,569.00	7,731.00	30,769.00	8,200.00
PEARL 4 - PANTARON RANGE	39,896.00	3,605.00	41,698.50	7,349.00	50,850.00	9,151.50
PEARL 5 - WAO RANGE	6,332.00	1,831.00	7,247.50	3,062.00	11,225.00	3,977.50
PEARL 6 - MATIGSALOG RANGE	15,674.00	5,700.00	18,524.00	3,098.00	24,472.00	5,948.00
TOTAL	130,095.00	15,239.00	137,714.50	36,442.00	181,776.00	44,061.50
As of 2009	Maximum	Maximum		Minimum		

TO PROTECT THE EXISTING
137,715 hectares

RATIO IS

1 has. Planted
= 3 has. protected

WE PLANT TREES ON
44,062 hectares

METHODOLOGY

For Sustainable Watershed Management and Forest Rehabilitation *or* RAINFORESTATION:

1. Rainforestation of Cogonal Lands
   Phase 1 - planting of Calliandra
   Phase 2 - planting of tree species for beneficiary & permanent watershed.

2. Transformation of buffer zone IP individual residents and communities from destructors to guardians of the rain forest.

3. Applications of innovative GIS Technology for pin point data gathering, project identification and mapping.

OUR FIRST TREE PLANTING OF KITANGLAD RANGE

Calliandra

(A Leguminous tree of the Ipil-Ipil family)

How it works:

PHASE 1

Plant Calliandra at a spacing of 1x5 0r 2x5 Trim after 2 years

PHASE 2

Inter-Plant Indigenous species for Reforestation/Commercial Tree farming

How Calliandra works:

The Calliandra system ensures sustainable reforestation and tree farming for Buffer Zone IP beneficiaries

NO GRASS – NO FIRES

(Horizontal multi-layer branching creates heavy shading where grasses cannot survive)

Other Benefits:

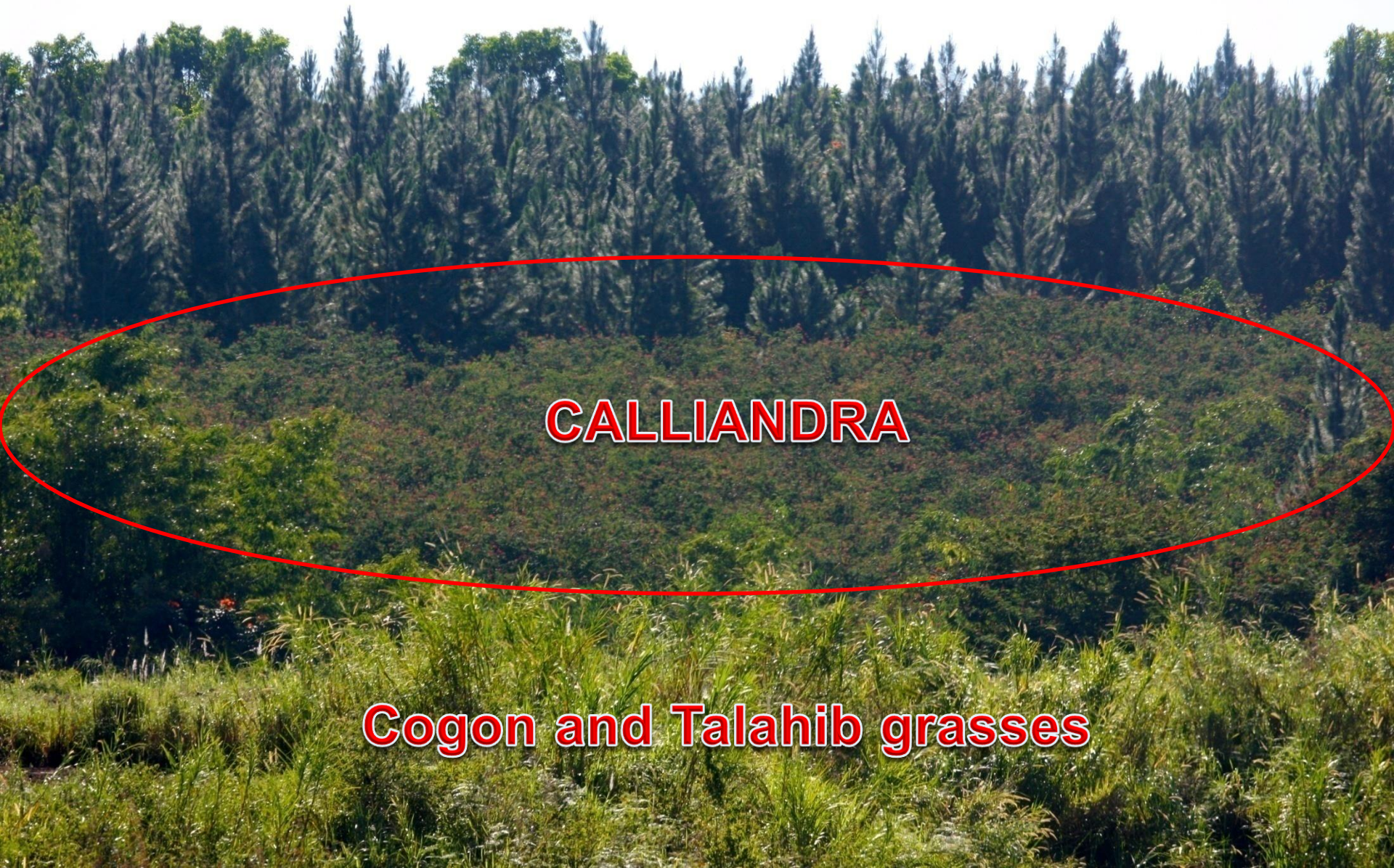
NO WEEDS – LESS MAINTENANCE COST

LEGUMINOUS MULCHING – LESS FERTILIZER

GOOD FIREWOOD & FODDER

The only proven methodology that eliminates cogon grass and the "chimney effect" fires

CALLIANDRA with PINE TREES




CALLIANDRA
PINE
CALLIANDRA SEEDLINGS
NO GRASSES!


CALLIANDRA with LAWAAN
TREES

How IP buffer zone communities contribute to forest destruction?

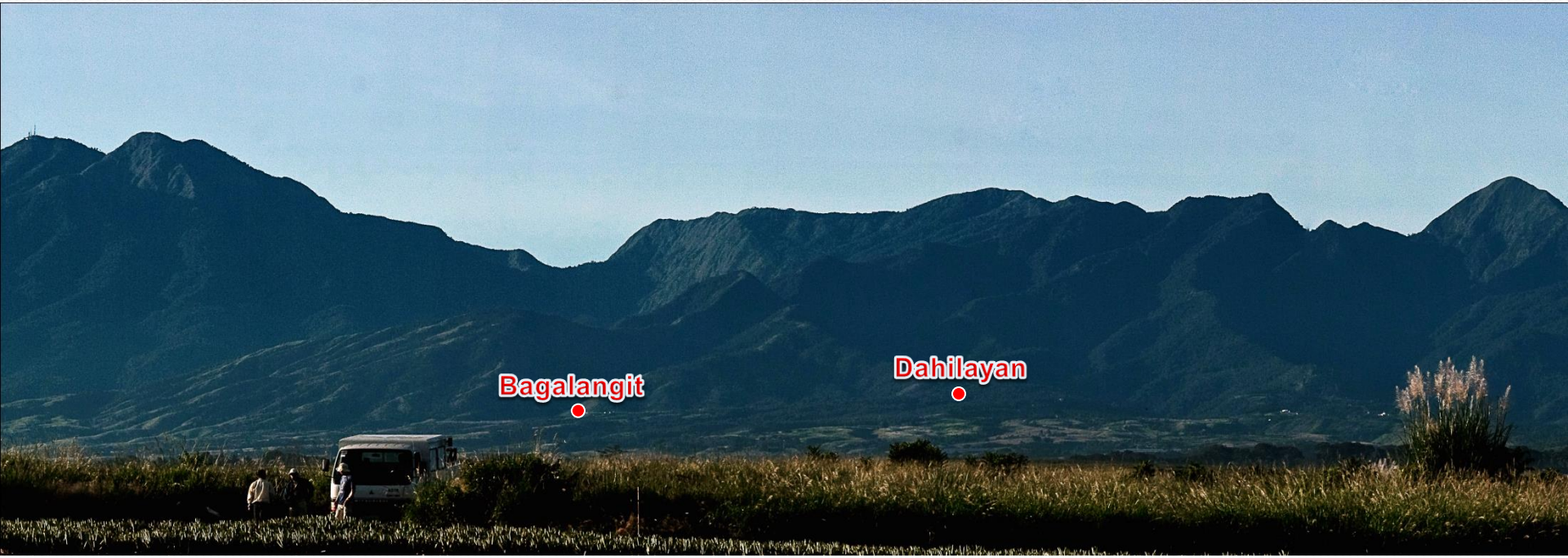
1. Clear patches of forest for food cropping then move on to new clearings after 2 or 3 years. The old clearing is taken over by cogon which later burns creating the "Chimney Effect" eventually burning all the way up to the top of each mountain ridge.

2. The Hunters Burn vegetation along the riverbanks and these fires also burn up the catchments all the way to the ridges.

3. Cutting small trees for firewood.

Who are these Indigenous People of the buffer zone?

KITANGLAD MOUNTAIN RANGE




Transform Buffer Zone IP Residents
to Guardians of the Forests by:
a. Provide them with Short, Medium and Long-Term Sustainable Income opportunities.
b. Provide food self-sufficiency for their families.
c. Provide renewable source of firewood for cooking.
d. Provide Value Formation Program
12/15/2008

What is the Indigenous People beneficiary model?

- **Total Land Area – Taken at 6 hectares considered to be maximum area that one family can maintain properly:**
  - 1/4 hectare for family food consumption
  - 5 ¾ hectare for short, medium and long-term income generation activities
- **Timeframe for livelihood activities**
  - Short-term (18 months) : Abaca
  - Medium-term (4-5 years) : Bamboo
  - Long-term (13-15 years) : Trees

CROP MODEL MATRIX BY ELEVATION

Elevation	Kalatungan/Kitanglad		Pantaron (Eastern)		Matigsalog		Tago West		Tago East		Bumbaran/Wao	
	Bagalangit		Bendum Busdi				Guihean Guilang2 Santiago		Magawa/ Bulonay			
	Talaandig/ Bukidnon/ Higaonon	Migrant	Higaonon Pulangiyon/ Umayamnon/ Tigwahanon	Migrant	Matigsalog/ Manobo/ Tigwahanon	Migrant	Higaonon Bukidnon	Migrant	Higaonon Pulangihon	Migrant	Maranao	Migrant
1000 and above	Model A Caribbean Pine Abaca	Model B Caribbean Pine	x	x	x	x	Model A Caribbean Pine Abaca	x	Model A Caribbean Pine Abaca	x	Model A Caribbean Pine Abaca	Model B Caribbean Pine
800-1000	Model C Bamboo (G) Rattan Abaca Caribbean Pine Mangium (S)	Model D Bamboo (G) Caribbean Pine Mangium (S)	Model C Bamboo (G) Rattan Abaca Caribbean Pine Mangium (S)	Model E Bamboo (G) Caribbean Pine Mangium (S)	Model C Bamboo (G) Rattan Abaca Caribbean Pine Mangium (S)	Model D Bamboo (G) Caribbean Pine Mangium (S)	Model F Bamboo (G) Rattan Abaca Caribbean Pine Mangium (S)	Model D Bamboo (G) Caribbean Pine Mangium (S)	Model C Bamboo (G) Rattan Abaca Caribbean Pine Mangium (S)	Model D Bamboo (G) Caribbean Pine Mangium (S)	Model C Bamboo (G) Rattan Abaca Caribbean Pine Mangium (S)	Model D Bamboo (G) Caribbean Pine Mangium (S)
600-800	Model G Bamboo (G) Rattan Abaca Mangium (S)	Model H Bamboo (G) Mangium (S)	Model G Bamboo (G) Rattan Abaca Mangium (S)	Model H Bamboo (G) Mangium (S)	Model G Bamboo (G) Rattan Abaca Mangium (S)	Model H Bamboo (G) Mangium (S)	Model G Bamboo (G) Rattan Abaca Mangium (S)	Model H Bamboo (G) Mangium (S)	Model G Bamboo (G) Rattan Abaca Mangium (S)	Model H Bamboo (G) Mangium (S)	Model G Bamboo (G) Rattan Abaca Mangium (S)	Model H Bamboo (G) Mangium (S)
Below 600	Model I Bamboo (G) Mangium (S) Rubber	Model I Bamboo (G) Mangium (S) Rubber	Model I Bamboo (G) Mangium (S) Rubber	Model I Bamboo (G) Mangium (S) Rubber	Model I Bamboo (G) Mangium (S) Rubber	Model I Bamboo (G) Mangium (S) Rubber	Model I Bamboo (G) Mangium (S) Rubber	Model I Bamboo (G) Mangium (S) Rubber	Model I Bamboo (G) Mangium (S) Rubber	Model I Bamboo (G) Mangium (S) Rubber	Model I Bamboo (G) Mangium (S) Rubber	Model I Bamboo (G) Mangium (S) Rubber

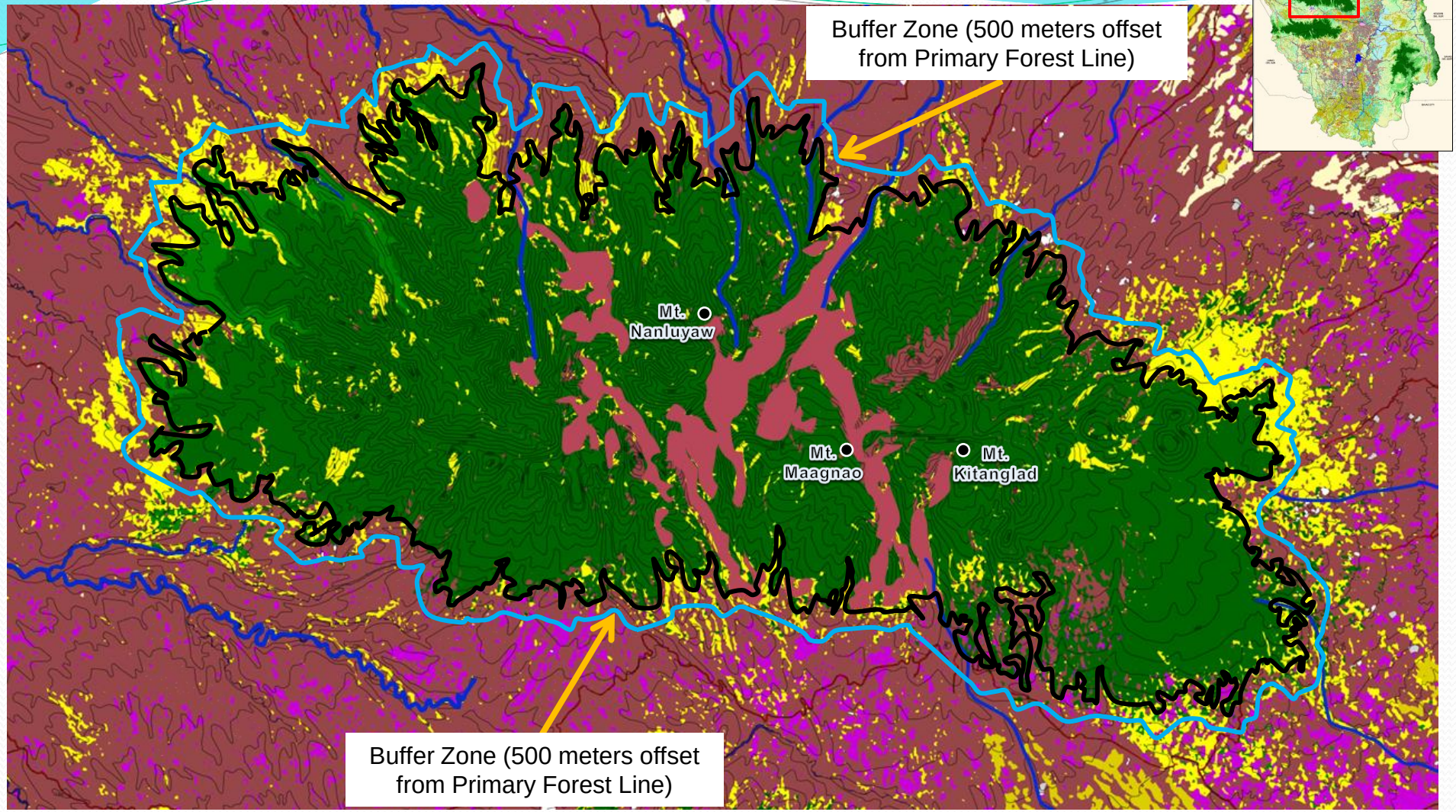
CROP MODEL MATRIX BY ELEVATION

AVERAGE MONTHLY INCOME PER HOUSEHOLD (Php)

Year	Kalatungan/Kitanglad		Pantaron (Eastern)		Matigsalog		Tago West		Tago East		Bumbaran/Wao	
	Bagalangit		Bendum Busdi				Guihean Guilang2 Santiago		Magawa/ Bulonay			
	Talaandig/ Bukidnon/ Higaonon	Migrant	Higaonon Pulangiyon/ Umayamnon/ Tigwahanon	Migrant	Matigsalog/ Manobo/ Tigwahanon	Migrant	Higaonon Bukidnon	Migrant	Higaonon Pulangihon	Migrant		Migrant
	Model A	Model B					Model A		Model A		Model A	Model B
Year 3	8,171.57	-					8,171.57		8,171.57		8,171.57	-
Year 5	8,171.57	-	x	x	x	x	8,171.57	x	8,171.57	x	8,171.57	-
Year 10	8,171.57	-					8,171.57		8,171.57		8,171.57	-
Year 14	97,482.41	89,310.83					97,482.41		97,482.41		97,482.41	89,310.83
Year 16	8,171.57	-					8,171.57		8,171.57		8,171.57	-
Year 18	20,171.57	-					20,171.57		20,171.57		20,171.57	-
	Model C	Model D	Model C	Model E	Model C	Model D	Model F	Model D	Model C	Model D	Model C	Model D
Year 3	8,171.57	-	8,171.57	-	8,171.57	-	3,145.96	-	8,171.57	-	8,171.57	-
Year 5	8,171.57	-	8,171.57	-	8,171.57	-	5,667.20	-	8,171.57	-	8,171.57	-
Year 10	20,671.57	12,500.00	20,671.57	18,750.00	20,671.57	12,500.00	30,667.20	12,500.00	20,671.57	12,500.00	20,671.57	12,500.00
Year 14	118,363.24	113,316.67	118,363.24	115,419.58	118,363.24	113,316.67	130,471.11	113,316.67	118,363.24	113,316.67	118,363.24	113,316.67
Year 16	23,171.57	-	23,171.57	-	23,171.57	-	32,008.20	-	23,171.57	-	23,171.57	-
Year 18	32,671.57	15,625.00	32,671.57	23,437.50	32,671.57	15,625.00	48,258.20	15,625.00	32,671.57	15,625.00	32,671.57	15,625.00
	Model G	Model H	Model G	Model H	Model G	Model H	Model G	Model H	Model G	Model H	Model G	Model H
Year 3	4,085.79	-	4,085.79	-	4,085.79	-	4,085.79	-	4,085.79	-	4,085.79	-
Year 5	4,085.79	-	4,085.79	-	4,085.79	-	4,085.79	-	4,085.79	-	4,085.79	-
Year 10	29,085.79	25,000.00	29,085.79	25,000.00	29,085.79	25,000.00	29,085.79	25,000.00	29,085.79	25,000.00	29,085.79	25,000.00
Year 14	144,108.29	127,772.50	144,108.29	127,772.50	144,108.29	127,772.50	144,108.29	127,772.50	144,108.29	127,772.50	144,108.29	127,772.50
Year 16	25,085.79	-	25,085.79	-	25,085.79	-	25,085.79	-	25,085.79	-	25,085.79	-
Year 18	41,335.79	25,000.00	41,335.79	25,000.00	41,335.79	25,000.00	41,335.79	25,000.00	41,335.79	25,000.00	41,335.79	25,000.00
	Model I	Model I	Model I	Model I	Model I	Model I	Model I	Model I	Model I	Model I	Model I	Model I
Year 3	-	-	-	-	-	-	-	-	-	-	-	-
Year 5	-	-	-	-	-	-	-	-	-	-	-	-
Year 10	29,500.00	29,500.00	29,500.00	29,500.00	29,500.00	29,500.00	29,500.00	29,500.00	29,500.00	29,500.00	29,500.00	29,500.00
Year 14	115,684.17	115,684.17	115,684.17	115,684.17	115,684.17	115,684.17	115,684.17	115,684.17	115,684.17	115,684.17	115,684.17	115,684.17
Year 16	4,500.00	4,500.00	4,500.00	4,500.00	4,500.00	4,500.00	4,500.00	4,500.00	4,500.00	4,500.00	4,500.00	4,500.00
Year 18	35,750.00	35,750.00	35,750.00	35,750.00	35,750.00	35,750.00	35,750.00	35,750.00	35,750.00	35,750.00	35,750.00	35,750.00

KITANGLAD RANGE (PROTECTED AND BUFFER ZONE AREA)

REMOTE SENSING MAP (BUKIDNON LAND COVER)



LEGEND:

- PRIMARY FOREST (1,000 meters above sea level)
- PRIMARY FOREST (below 1,000meters above sea level)
- SECONDARY FOREST (with 40% to 60% tree cover)
- BUFFER ZONE AREA
- PRIMARY FOREST LINE
- CONTOUR (100 Meter Interval)
- GRASSLAND, SHRUBLAND and OTHER LAND with TREE COVER (less than 20% tree cover)

Reference: ESSC/HFI

PEARL 1 – WATERSHED SERVICE AREA FOR FOOD PRODUCTION

(REMOTE SENSING/TOPO MAP)

KITANGLAD MOUNTAIN RANGE

BOBONAWAN-AGUSAN
TARGET PROJECT AREA = 984 Has.

AGUSAN-KUMAYKAY-MANGIMA
TARGET PROJECT AREA = 753 Has.

MANGIMA-KULAMAN
TARGET PROJECT AREA = 814 Has.

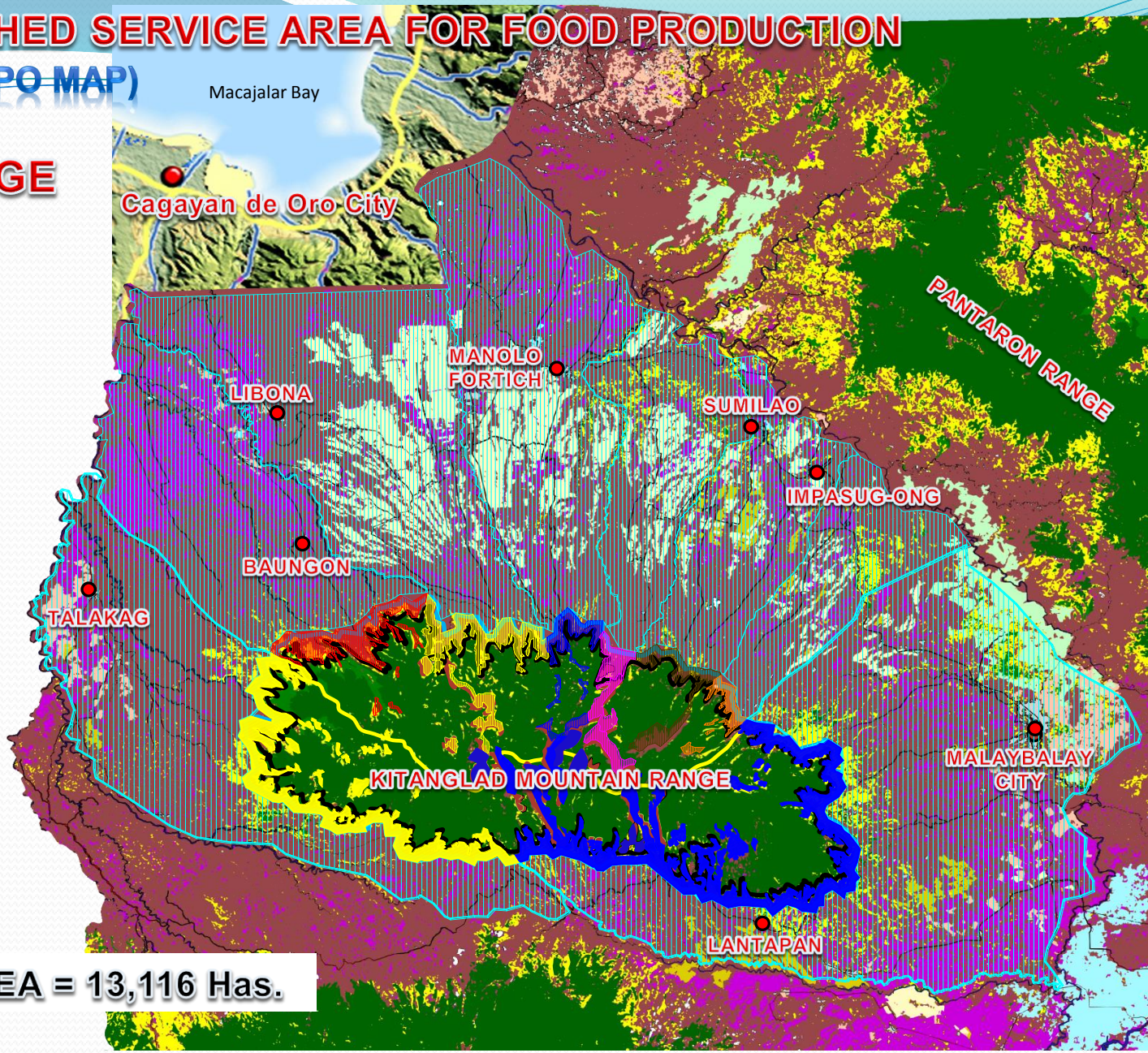
KULAMAN-ATUGAN
TARGET PROJECT AREA = 713 Has.

ATUGAN-BDRY MALAYBALY CITY
TARGET PROJECT AREA = 458 Has.

BOBONAWAN-BDRY TALAKAG
TARGET PROJECT AREA = 2,251 Has.

TALAKAG-BDRY LANTAPAN
TARGET PROJECT AREA = 2,857 Has.

LANTAPAN-MALAYBALAY
TARGET PROJECT AREA = 4,286 Has.



TOTAL PROSPECT AREA = 13,116 Has.

LEGEND:

- PRIMARY FOREST (1,000 meters above sea level)
- PRIMARY FOREST (below 1,000meters above sea level)
- SECONDARY FOREST (with 40% to 60% tree cover)
- PRIMARY FOREST LINE
- BUFFER ZONE AREA
- GRASSLAND, SHRUBLAND and OTHER LAND with TREE COVER (less than 20%)

Reference: ESSC/HFI

PEARL 1 – KITANGLAD MOUNTAIN RANGE

Critical Head Waters Project 1:
Agusan-Kumaykay-Mangima-Kulaman Rivers

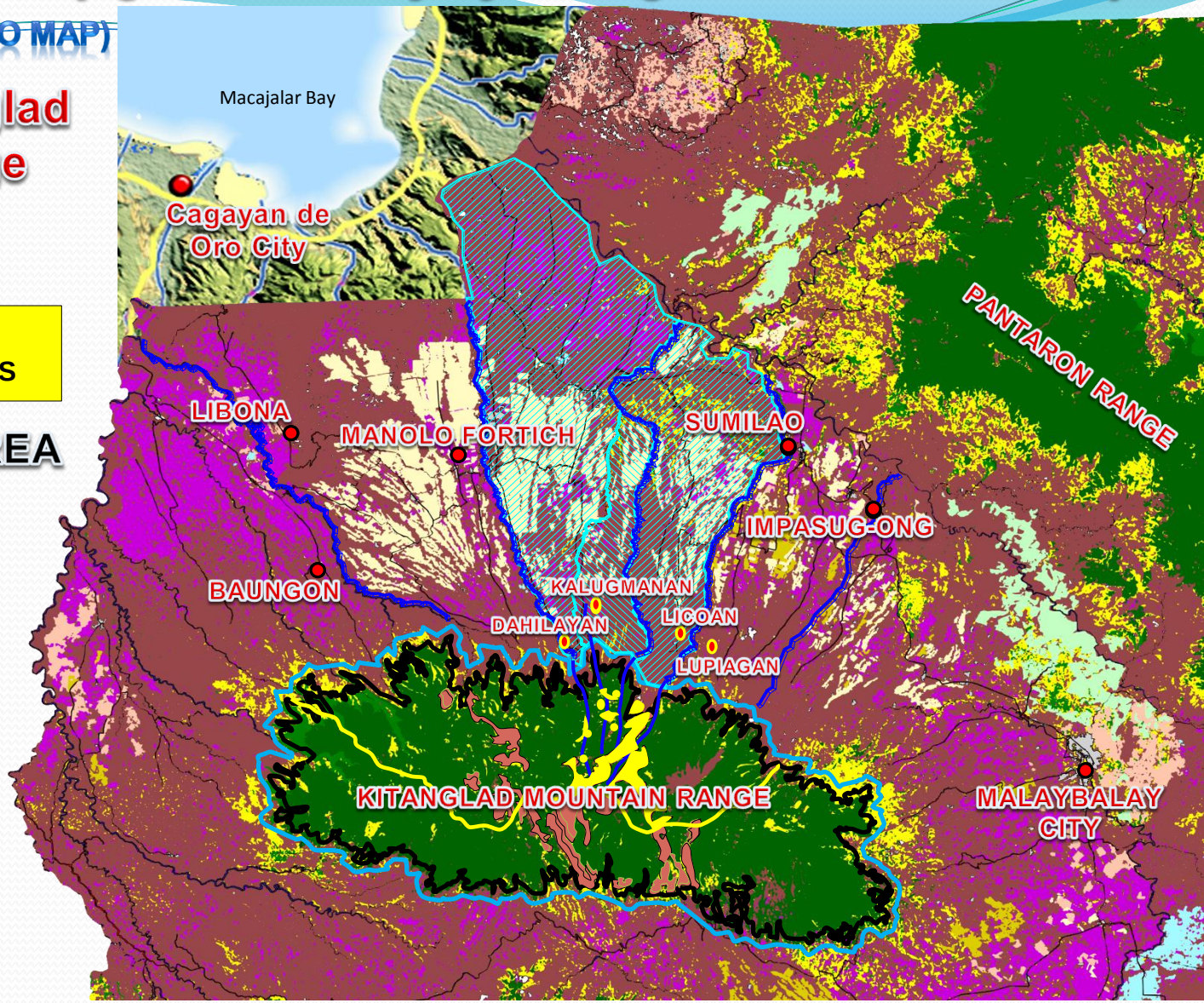
PEARL 1 - PROJECT 1: (Agusan – Kumaycay – Mangima – Kulaman Rivers)

(REMOTE SENSING/TOPO MAP)

Portion of Kitanglad Mountain Range

AGUSAN-KUMAYKAY-MANGIMA-KULAMAN RIVERS

TOTAL PROJECT AREA = 1,567 Has.



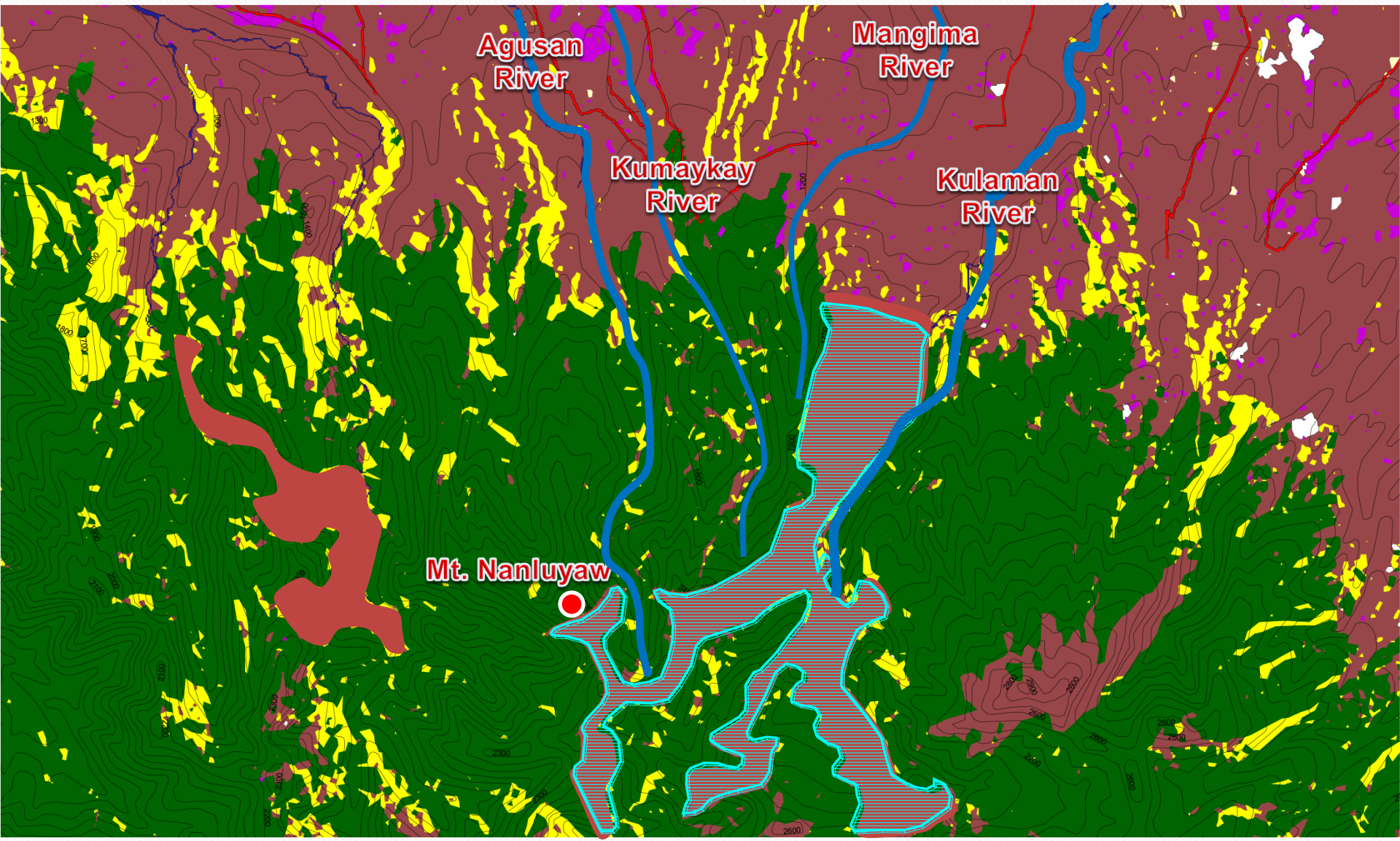
LEGEND:

- PRIMARY FOREST (1,000 meters above sea level)
- PRIMARY FOREST (below 1,000meters above sea level)
- SECONDARY FOREST (with 40% to 60% tree cover)
- PRIMARY FOREST LINE
- BUFFER ZONE AREA
- GRASSLAND, SHRUBLAND and OTHER LAND with TREE COVER (less than 20%)

Reference: ESSC/HFI

PEARL 1 – PROJECT 1: CRITICAL HEADWATER - Agusan–Kumaykay–Mangima–Kulaman Rivers

REMOTE SENSING and TOPO MAP



PHYSICAL and COST SUMMARY

AREA IN HECTARES					
PRIMARY FOREST	SECONDARY FOREST	TOTAL EXISTING FOREST	GRASSLAND/ SHRUBLAND	TOTAL FOREST AREA	PROSPECT AREA FOR TREE PLANTING
above and below 1,000 meters above sea level	with 40% to 60% tree cover	Primary Forest + 50% of Secondary Forest	Other Land with Tree Cover (Less than 20% Tree Cover)		(50% of Secondary Forest + Total Grassland/Shrubland /Other land with tree cover)
2,866	47	2,889	1,544	4,456	1,567

ALLOCATION OF PROSPECT AREA		
BENEFICIARY PLANTING	PERMANENT WATERSHED	TOTAL
312	1,255	1,567

NUMBER OF BENEFICIARY FAMILIES	52

PROJECT FINANCING - IN USD (000's)		
BENEFICIARY PLANTING	PERMANENT WATERSHED	TOTAL
854	1,880	2,734

COST PER HECTARE - IN USD			
NEW TREE PLANTINGS			TOTAL FOREST AREA
BENEFICIARY PLANTING	PERMANENT WATERSHED	AVERAGE	
2,736	1,498	1,744	613

PEARL 1 – KITANGLAD MOUNTAIN RANGE

Critical Head Waters Project 2:

Maagnao River

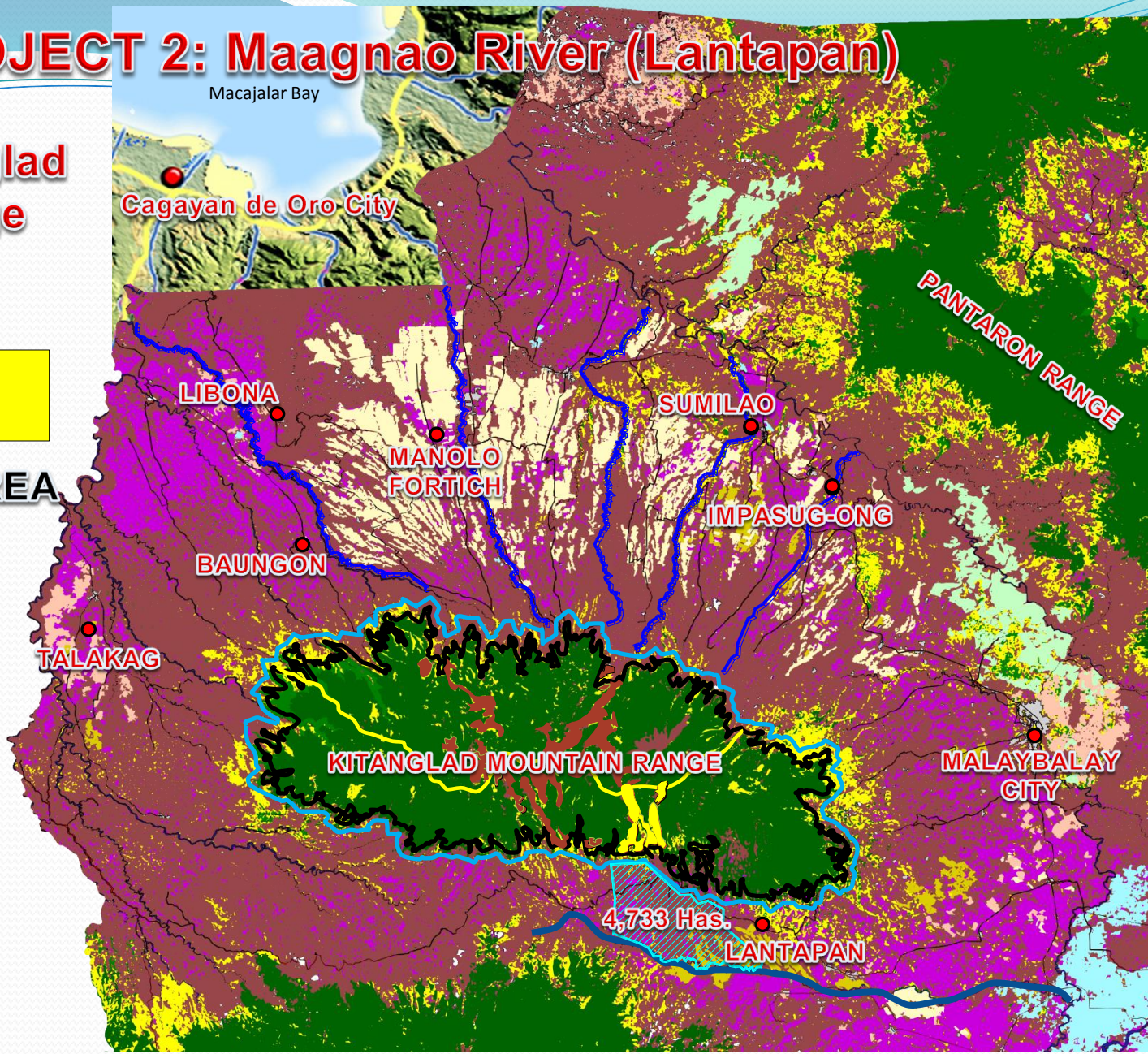
(LANTAPAN)

PEARL 1 – PROJECT 2: Maagnao River (Lantapan)

Portion of Kitanglad Mountain Range

MAAGNAO RIVER

TOTAL PROJECT AREA = 1,209 Has.



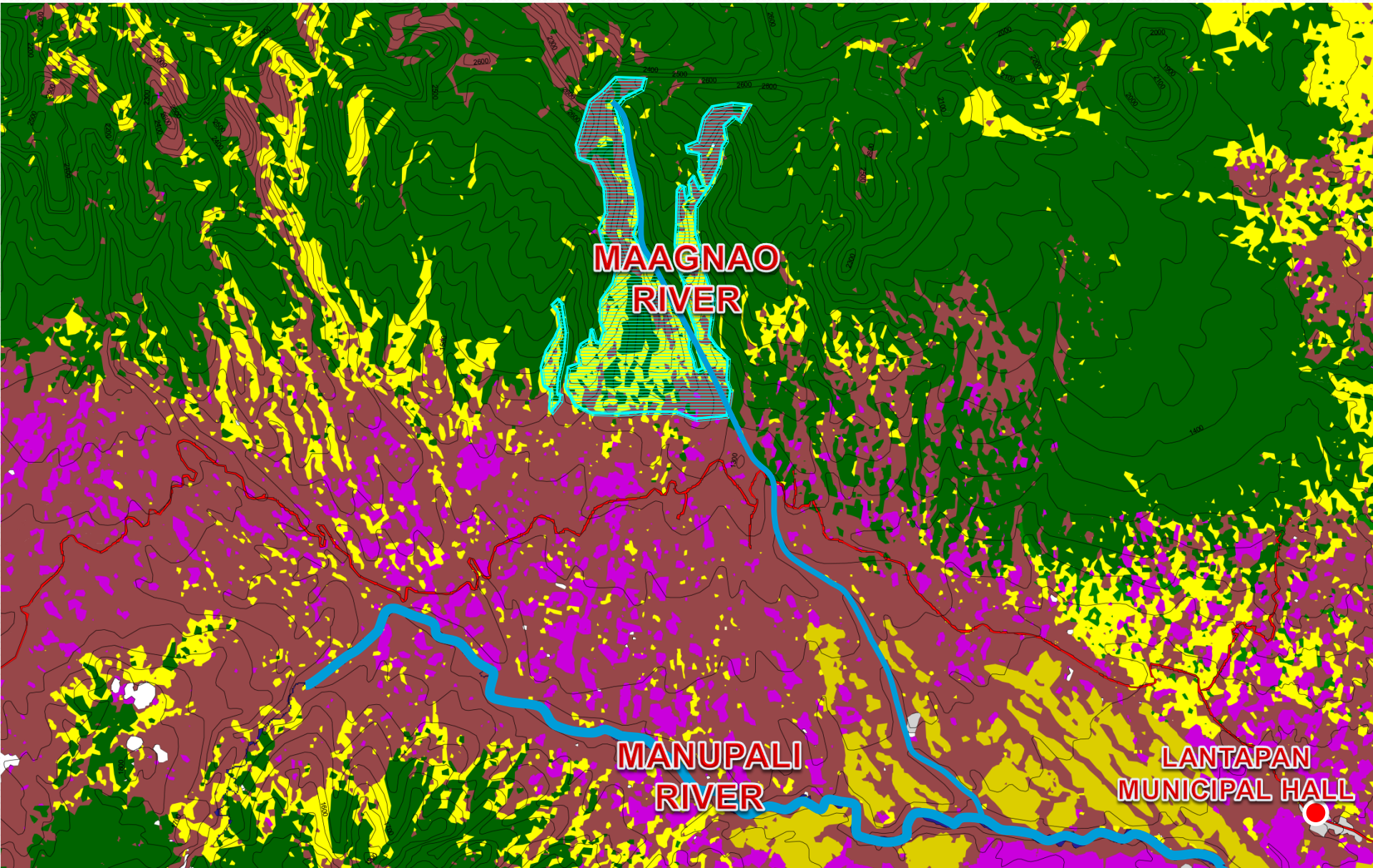
LEGEND:

- PRIMARY FOREST (1,000 meters above sea level)
- PRIMARY FOREST (below 1,000meters above sea level)
- SECONDARY FOREST (with 40% to 60% tree cover)
- PRIMARY FOREST LINE
- BUFFER ZONE AREA
- GRASSLAND, SHRUBLAND and OTHER LAND with TREE COVER (less than 20%)

Reference: ESSC/HFI

PEARL 1 – PROJECT 2: CRITICAL HEADWATER - MAAGNAO RIVER

REMOTE SENSING and TOPO MAP



PHYSICAL and COST SUMMARY

AREA IN HECTARES					
PRIMARY FOREST	SECONDARY FOREST	TOTAL EXISTING FOREST	GRASSLAND/ SHRUBLAND	TOTAL FOREST AREA	PROSPECT AREA FOR TREE PLANTING
above and below 1,000 meters above sea level	with 40% to 60% tree cover	Primary Forest + 50% of Secondary Forest	Other Land with Tree Cover (Less than 20% Tree Cover)		(50% of Secondary Forest + Total Grassland/Shrubland /Other land with tree cover)
1,943	77	1,982	1,170	3,190	1,209

ALLOCATION OF PROSPECT AREA		
BENEFICIARY PLANTING	PERMANENT WATERSHED	TOTAL
228	981	1,209

NUMBER OF BENEFICIARY FAMILIES	38

PROJECT FINANCING - IN USD (000's)		
BENEFICIARY PLANTING	PERMANENT WATERSHED	TOTAL
493	1,468	1,961

COST PER HECTARE - IN USD			
NEW TREE PLANTINGS			TOTAL FOREST AREA
BENEFICIARY PLANTING	PERMANENT WATERSHED	AVERAGE	
2,162	1,498	1,623	615

PEARL – PHYSICAL SUMMARY

ALLOCATION OF PROSPECT AREA FOR TREE PLANTING				NUMBER OF BENEFICIARY FAMILIES
MOUNTAIN RANGE	BENEFICIARY PLANTING	PERMANENT WATERSHED	TOTAL	
PEARL 1 - KITANGLAD	3,654	9,462	13,116	609
PEARL 2 - BUMBARAN	2,160	1,509	3,669	360
PEARL 3 - MT. KALATUNGAN	4,854	3,346	8,200	809
PEARL 4 - PANTARON	7,548	1,604	9,152	1,258
PEARL 5 - WAO	1,506	2,472	3,978	251
PEARL 6 - MATIGSALOG	3,600	2,348	5,948	600
TOTAL	23,322	20,740	44,062	3,887

MOUNTAIN RANGE	AREA (HECTARES)					
	PRIMARY FOREST	SECONDARY FOREST	TOTAL FOREST AREA	GRASSLAND/SHRUBLAND	TOTAL	PROSPECT AREA FOR TREE PLANTING (50% of Secondary Forest + Total Grassland/Shrubland/ Other land with tree cover<20%)
	above and below 1,000 meters above sea level	with 40% to 60% tree cover	Primary Forest + 50% of Secondary Forest	Other Land with Tree Cover (Less than 20% Tree Cover)		
PEARL 1 - KITANGLAD	36,596	1,944	37,568	12,144	50,684	13,116
PEARL 2 - BUMBARAN	9,497	1,221	10,108	3,058	13,776	3,669
PEARL 3 - MT. KALATUNGAN	22,100	938	22,569	7,731	30,769	8,200
PEARL 4 - PANTARON	39,896	3,605	41,699	7,349	50,850	9,152
PEARL 5 - WAO	6,332	1,831	7,248	3,062	11,225	3,978
PEARL 6 - MATIGSALOG	15,674	5,700	18,524	3,098	24,472	5,948
TOTAL	130,095	15,239	137,715	36,442	181,776	44,062

PEARL – COST SUMMARY

PROJECT FINANCING - IN USD (000's)			
MOUNTAIN RANGE	BENEFICIARY PLANTING	PERMANENT WATERSHED	TOTAL
PEARL 1 - KITANGLAD	9,532	14,171	23,703
PEARL 2 - BUMBARAN	5,899	2,259	8,158
PEARL 3 - MT. KALATUNGAN	11,834	5,011	16,845
PEARL 4 - PANTARON	15,864	2,402	18,265
PEARL 5 - WAO	3,674	3,702	7,376
PEARL 6 - MATIGSALOG	9,169	3,517	12,685
TOTAL	55,971	31,061	87,032

COST PER HECTARE - IN USD				
MOUNTAIN RANGE	NEW TREE PLANTINGS			TOTAL FOREST AREA
	BENEFICIARY PLANTING	PERMANENT WATERSHED	AVERAGE	
PEARL 1 - KITANGLAD	2,609	1,498	1,807	468
PEARL 2 - BUMBARAN	2,731	1,498	2,224	592
PEARL 3 - MT. KALATUNGAN	2,438	1,498	2,054	547
PEARL 4 - PANTARON	2,102	1,498	1,996	359
PEARL 5 - WAO	2,440	1,498	1,854	657
PEARL 6 - MATIGSALOG	2,547	1,498	2,133	518
AVERAGE	2,400	1,498	1,975	479

PEARL Financial Analysis

FINANCIAL SUMMARY											
	Payback Period		Financial Internal Rate of Return				NPV-15th Yr USD (000's)		Buffer zone Communities	Number of Households	Number of Beneficiaries
			15th Year		20th Year						
	Beneficiary	Total	Beneficiary	Total	Beneficiary	Total	Beneficiary	Total			
PEARL 1	9th Year	16th Year	14.06%	-1.34%	15.82%	1.91%	1,688	-8,233	25	609	3,654
PEARL 2	8th Year	10th Year	17.43%	11.22%	18.23%	12.29%	2,176	444	9	360	2,160
PEARL 3	8th Year	11th Year	15.94%	9.25%	16.99%	10.70%	3,158	-495	21	809	4,854
PEARL 4	12th Year	12th Year	9.96%	6.97%	13.69%	11.04%	-24	-1,848	14	1,258	7,548
PEARL 5	10th Year	16th Year	12.75%	1.59%	13.81%	3.31%	477	-2,279	7	251	1,506
PEARL 6	10th Year	12th Year	12.58%	6.72%	14.70%	9.37%	1,034	-1,667	15	600	3,600
TOTAL	10th Year	14th Year	13.65%	5.52%	15.50%	8.12%	8,508	-14,078	91	3,887	23,322

PEARL Economic Analysis (*with and without program scenarios*)

ECONOMIC SUMMARY											
	Payback Period		Economic Internal Rate of Return				NPV-15th Yr USD (000's)		Buffer zone Communities	Number of Households	Number of Beneficiaries
			15th Year		20th Year						
	Beneficiary	Total	Beneficiary	Total	Beneficiary	Total	Beneficiary	Total			
PEARL 1	6th Year	12th Year	30.19%	11.02%	30.99%	13.02%	9,782	853	25	609	3,654
PEARL 2	6th Year	7th Year	33.01%	25.19%	33.45%	25.86%	8,272	6,713	9	360	2,160
PEARL 3	6th Year	7th Year	32.79%	24.61%	33.26%	25.34%	15,598	12,311	21	809	4,854
PEARL 4	8th Year	9th Year	34.84%	29.68%	35.76%	30.79%	20,156	18,514	14	1,258	7,548
PEARL 5	7th Year	10th Year	28.79%	15.71%	29.40%	16.84%	4,575	2,094	7	251	1,506
PEARL 6	7th Year	8th Year	30.58%	23.00%	31.45%	24.20%	11,674	9,244	15	600	3,600
TOTAL	7th Year	9th Year	32.10%	21.78%	32.81%	22.93%	70,056	49,729	91	3,887	23,322

THE ADDITIONAL BENEFITS OF PLANTING TREES: YOUR PERSONAL CONTRIBUTION

hinelebanfoundation

1 ha of trees = 3rd year 15 tons of CO_2 sequestered / ha / year
= 5th year 25 tons of CO_2 sequestered / ha / year
= 10th year 50 tons of CO_2 sequestered / ha / year
= 15th year 75 tons of CO_2 sequestered / ha / year
= 20th year 100 tons of CO_2 sequestered / ha / year

AVERAGE FAMILY OF FIVE

= 39 tons CO_2 emissions per year

= 0.78 hectares of trees per family

HOW MUCH CARBON DOES YOUR BUSINESS EMIT?

1,000 hectares of trees = 50,000 tons CO_2 sequestered per year by year 10

Role of Forests in Climate Change Mitigation

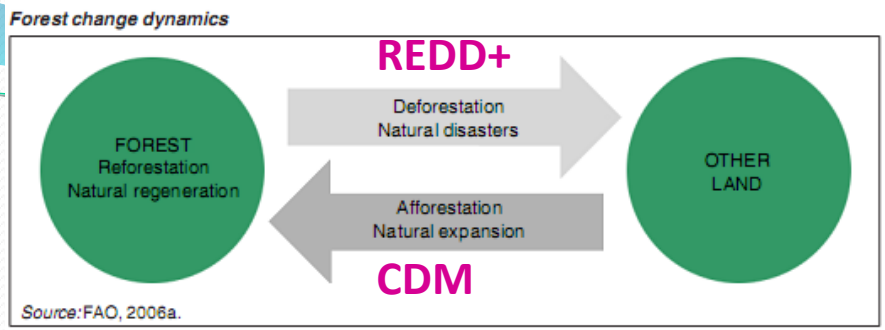
As carbon sinks…

- Conserve stored carbon in forests
- Enhance carbon storage in forests & their products
- Substitute wood for fossil fuels & high-energy products

As carbon sources…

- Conversion of forest to non-forest land use (deforestation)
- Change in canopy or structure (degradation)

What is REDD+?



- REDD is..
  - Reducing Emissions from Deforestation (avoided deforestation) and forest Degradation
- + is..
  - conservation of forest carbon stocks
  - sustainable management of forests
  - Enhancement of forest carbon stocks
- REDD+ is a mechanism to pay for environmental services from carbon sequestration.
- REDD+ is part of UNFCCC mechanism for mitigating climate change.

Philippines' Response to Climate Change Mitigation Challenge

Philippine National REDD+ Strategy (PNRPS)

Vision: Empowered forest managers sustainably and equitably managing forestlands and ancestral domains with enhanced carbon stock and reduced greenhouse gas emissions.

- Reduced forest degradation and deforestation
- Poverty alleviation
- Biodiversity Conservation
- Improved governance

http://ntfp.org/coderedd/the-philippine-national-redd-plus-strategy/

PEARL's link with PNRPS Features

- ✓ Watershed, Natural Ecosystem, Landscape approach to conservation and management
- ✓ Community tenured areas and protected areas as priority development zones
- ✓ Community-focused methodology
- ✓ Multi-level governance, maximizing existing decentralized working mechanisms
- ✓ Inter-sectoral coordination, participatory & multi-stakeholder partnerships
- ✓ Rigorous forest cover monitoring, a must for robust carbon accounting
- ✓ Nested, scaling up approach

KEY SUCCESS FACTORS

* Proven Methodology to Protect our Forests
* Effective Approaches to Transform IP's into Forest Guardians
* Active Watershed Management Council as the Project Driver
* Committed Support of the Local Government Leadership: Provincial, Municipal, Barangay & Tribal Leaders
* Technical Assistance and Financial Support

Group Experience over 3 decades

- Commercial Agricultural Production
  - 35 years in Bukidnon and Davao
  - 15 years in the Autonomous Region for Muslim Mindanao
- Reforestation & Rehabilitation of forests (20 years)
  - Grasslands/Mine Sites/Agricultural Complex
- Sustainable Livelihood Models
  - 5 Pilot Communities with about 100 hectares of Giant Bamboo and around 30 hectares of Arabica Coffee
  - 180 Indigenous People family beneficiaries with improved health and nutrition
- Excellent Community Relations and Network
- Naturally farmed Organic Vegetable Production

Maraming Salamat

Thank you for your kind attention