



**GROUP B  
B FOR THE BEST**

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Summer Course Program @ IPB, Bogor, 14-20 Sep 2013

**INTERNATIONAL SUMMER COURSE 2013**

The International Summer Course is a part of an annual short term international trans-mobility program which initiated by Ibaraki University (IU) and Bogor Agricultural University (IPB).

**Topic :**  
**Sustainable Tropical Agriculture Production Which  
 Special Reference on Plantation and Agroforestry**



**EXCLUSIVE REPORT GROUP B**



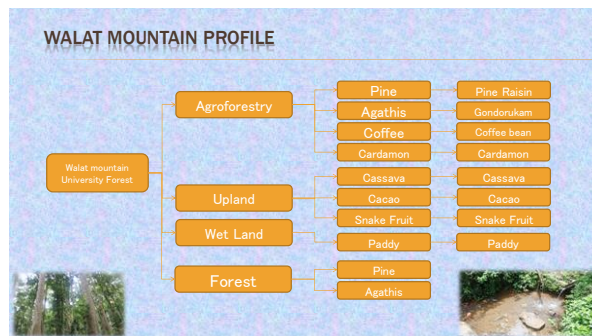
Profile of Gunung Walat Forest and IPB's Field



Sustainable Agriculture Analysis



One Week Activity




**CIKABAYAN UNIVERSITY FARM PROFILE**

Cikabayan university farm is one of the experimental farm developed by IPB, among others. The land area is approximately 50 ha. IPB allow the student to use the land as a research center and planning a variety plant, both type of fruits and vegetable. The animal science laboratory also in cikabayan.



**WALAT MOUNTAIN**



HUTAN PENDIDIKAN GEMUNG WALAT  
 FAKULTAS KERUKUTANAN IPB  
 PETAK KOLEKSI TUMBUHAN OBAT

# ENVIRONMENT ANALYSIS

### Content of Soil Analysis

The diagram illustrates the components of soil analysis. It includes four categories: Ammonium (represented by test tubes with green liquid), Nitrat (represented by test tubes with pink liquid), Potassium (represented by test tubes with green liquid), and pH of soil (represented by a person using a pH meter on a soil sample).

### Analysis of Water Samples

The flowchart shows the process of water sample analysis. It starts with a person taking a water sample, followed by pouring it into a test tube. The process then leads to the use of two test kits: 'Phosphat-Test Phosphat-Test' and 'Ammonium-Test Ammonium-Test'. The final step shows a person holding a test tube with a yellowish liquid.

### Measurement the Degreening Leaves

The diagram shows the process of measuring chlorophyll content in leaves. It starts with a person holding a leaf, followed by a digital scale showing a reading of 0.00g. The final step shows a person holding a small vial, likely containing the extracted chlorophyll.

### Making Pure Water

The flowchart shows the process of making pure water. It starts with a person taking a water sample, followed by pouring it into a bottle. The process then leads to a person checking the anion and cation content. The final step shows a person filtering the water through a filter.

### The Preparation of Analysis Contenti in Soil

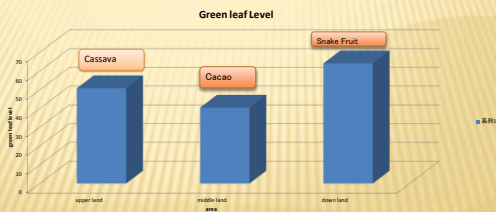
The diagram shows the process of preparing soil for analysis. It starts with a person taking a soil sample, followed by pouring it into a bottle. The final step shows a person filtering the soil through a filter.

### WATER NUTRIENT CONTENT

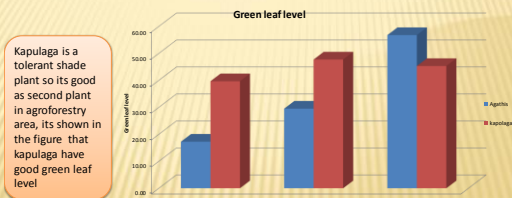
Area	NH4 (mg/l)	NO3 (mg/l)	PO4 (mg/l)	AL (mg/l)
downstream	LO	LO	5	LO
middlestream	LO	LO	LO	LO
upstream	LO	6	LO	LO

The springs have Low Content of NH4. In up stream have highest NO3 content because of rain or the organic matter decomposition.  
 The PO4 content in downstream also Highest maybe because of the farmer fertilizer  
 The AL content is low its good for plant to grow

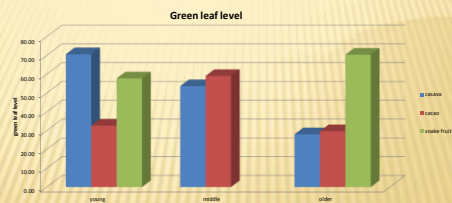
### GREEN LEAF LEVEL IN EVERY AREA



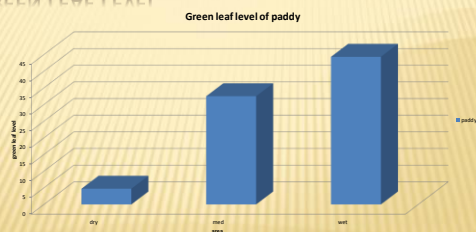
### GREEN LEAF LEVEL IN AGROFORESTRY



### GREEN LEAF LEVEL IN DRYLAND



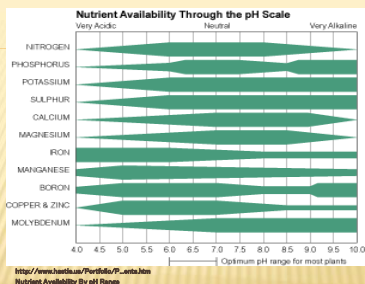
### GREEN LEAF LEVEL

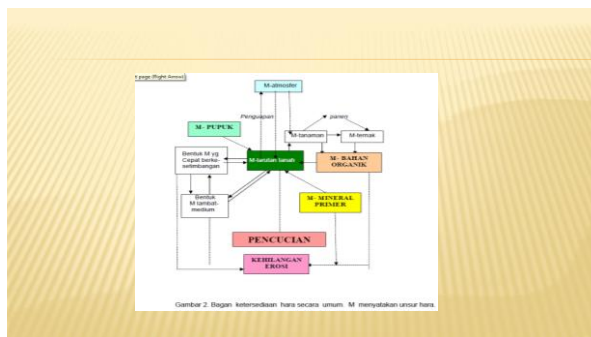
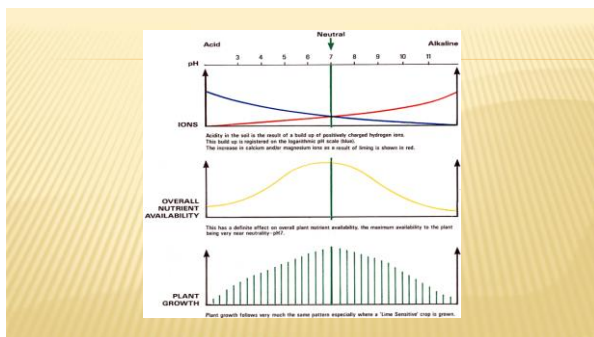


### pH of Soil



The pH average in Forest industry, agroforestry and dryland area is almost 6 and in the wet area is 5 more acid than the other because of its cultivation process



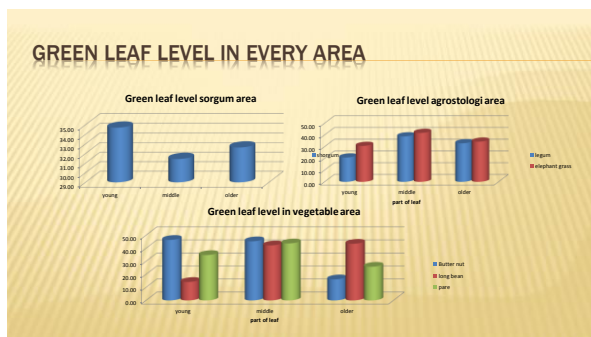
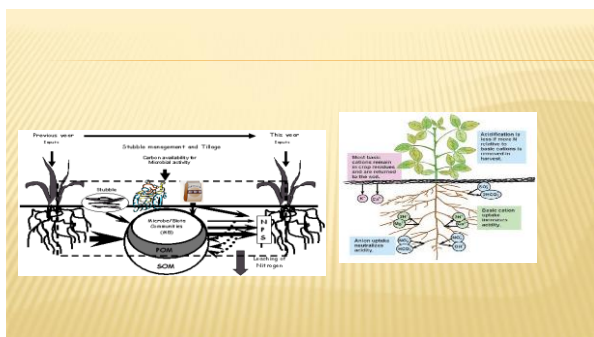
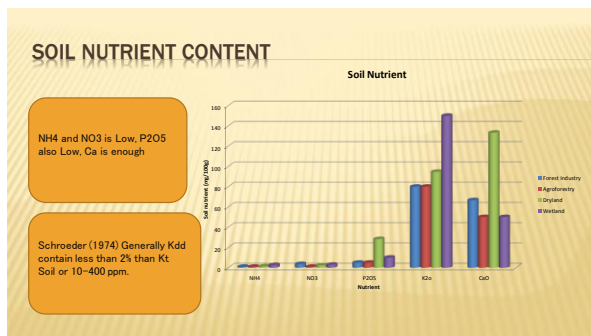


### NUTRIENTS AVAILABILITY STATUS

	very low	low	middle	high	very high
C-Organik (%)	< 1,00	1,00-2,00	2,01-3,00	3,01-5,00	> 5,00
Nitrogen (%)	< 0,10	0,10-0,20	0,21-0,50	0,51-0,75	> 0,75
C/N	< 5	5 - 10	11 - 15	16 - 25	> 25
Aluminium (%)	< 10	10 - 20	21 - 30	31 - 50	> 60

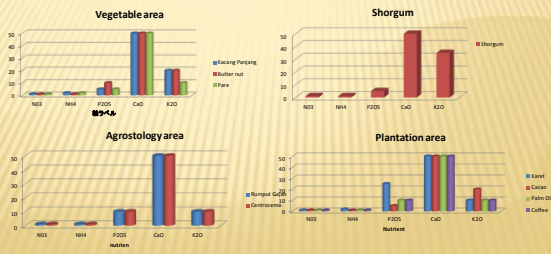
  

nutrients	Nutrients availability				Toksik
	Defisien	low	middle	high	
P (%)	< 0,16	0,16 - 0,25	0,26 - 0,50	0,51 - 0,80	> 0,80
K (%)	< 1,26	1,26 - 1,70	1,71 - 2,50	2,51 - 2,75	> 2,75
Mn (mg/kg)	< 15	15 - 20	21 - 100	100 - 250	> 250





### SOIL NUTRIENT CONTENT IN EVERY AREA



### CONCLUSION

- N and P nutrient content is low → organic matters and manure
- Adaptable plant to less N and P
- Based on appearance of the kapulaga plant growth → suitable for agroforestry
- Shading plant for agroforestry

### SOCIAL IMPACTS

- ✘ Educate people around Gunung Walat to keep the sustainability of the forest (not to cut down the trees, sense of belonging).



### ECONOMIC IMPACTS

- Provide job for local people around Gunung Walat (hire 40 local people as resin tappers) → increase income
  - Pine resin=cosmetics raw materials, paint, varnish  
Wage =Rp. 1.600/kg pine resin  
A tapper can tap 300 kg pine resin/month
  - Agatis copal= cosmetics raw materials, paint, varnish, aromatherapy products  
Wage=Rp. 2.000/kg copal  
A tapper can tap 200 kg copal/month.  
Average income that tappers get=  
Rp. 900.000- Rp. 1.500.000/month.



### ECONOMIC IMPACTS

- Cardamon → medicine  
Fresh cardamon= Rp. 4.000/kg.  
Dried cardamon=Rp. 15.000/kg.  
Per 400m2 can produce ± 50 kg.  
100 kg fresh cardamon → 50-60 kg dried cardamon.
- Coffee → opportunity to develop coffee farm (domestic and non-domestic demand)



### ECONOMIC IMPACTS

- ✘ Local people can get free access of the water.
- ✘ Carbon trade → Rp. 100.000/tree/year.
- ✘ Reduce environmental cost → air, water and soil pollution, waste, etc.



### SUGGESTION IN SOCIAL ECONOMIC ASPECTS:

- ✦ Processed product production to gain higher value added → increase tappers income and absorb more human resources as labor.  
Ex: medicine, aromatherapy products, cosmetics, etc.  
It causes high incremental cost for the business investment, but it has a good opportunity to get high profit in the long term.
- ✦ Promotion strategy for processed product → market penetration of new products.



### SUGGESTION IN SOCIAL ECONOMIC ASPECTS:

- ✦ Promotion for agroedutourism program  
→ get higher visitor so it can improve the business (economic) and teach and share to larger community about environment awareness (social).



### ECONOMIC POINT OF VIEW FOR SOIL CONTENT

- ✦ Soil content has a correlation with input cost to buy fertilizer and labor cost (in Indonesia, labor wage +/- Rp. 50.000/labor/day for plantation business).
- ✦ Lack of soil content → increased of production cost.
- ✦ Balanced fertilizing system → reduce environmental cost.



Walat Mountains

Tropical fruits

Water Management for Acacia plantation in tropical peatland

Human factors in Agricultural Production System

Types and benefits of bamboo

1. Walat mountain → success story how the forest land survive
2. Tropical fruits still sell in raw material → technology → social economy
1. Bamboo → many types → useful → social and economic impact
2. Agricultural need → human factor, management of environment, technology/local wisdom, senses of belonging

**Sustainability**  
Global changes  
Young generation  
Agent of Changes  
Our sciences  
Apply it in real  
Wait and see how our earth will have big smile ☺

**Sustainable Agricultural depends on:**

1. Method
2. Technology
3. Environment factor
4. Human factor

3. Sustainable → continues  
Keep the environment

2. To create sustainability in agriculture, all subsystem should be conducted together from upstream to downstream to support each other.

**What should we do to make Sustainability of agroforestry?**

1. Use the post harvest machinery to process the raw material from the forest. Applied machinery in post harvest we can make increase the product

**Shorgum**

Food  
Animal feed  
Biofuel  
Harvesting period 95-100 days

Adaptable to dry land → less water  
The petroleum stock is decreasing every year → It can be one of alternative biofuel in the future (sustainability)

