

AGROFORESTRY OF JELUTUNG ON PEATLAND: A LESSON LEARNED FROM CENTRAL KALIMANTAN



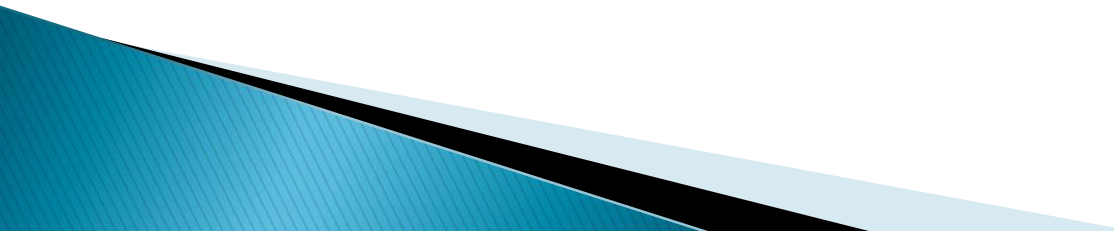
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OUTLINE

- ▶ INTRODUCTION
 - ▶ METHODS
 - ▶ RESULTS AND DISCUSSIONS
 - ▶ CONCLUSIONS
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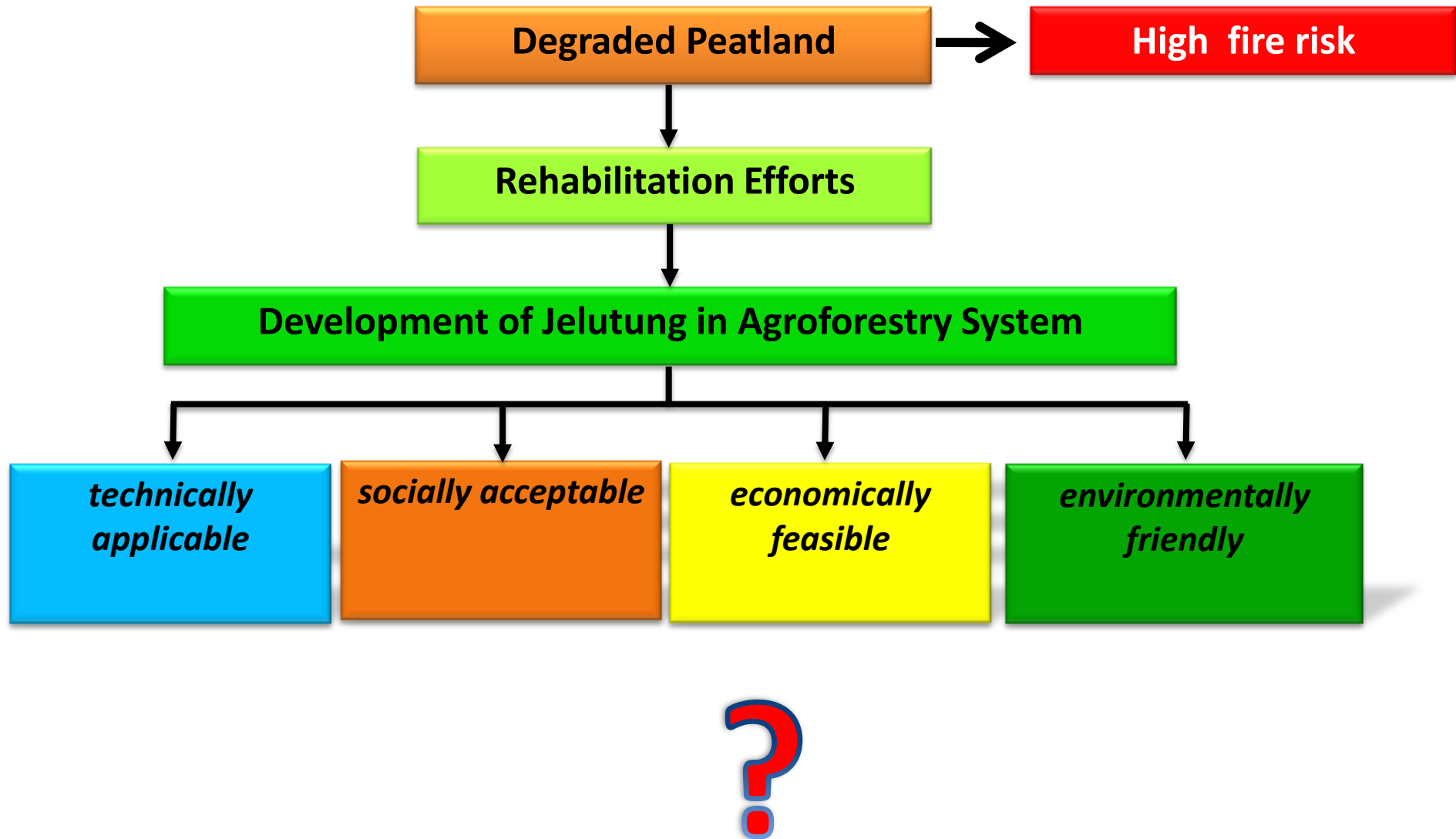
INTRODUCTION



- Indonesia's peatland ranks 4th after Canada, Russia and USA
- 20 mill ha in average
- The largest tropical peatland in the world

Critical peatland in Central Kalimantan

No.	Status & Function	Very critical (ha)	Critical (ha)	Almost critical (ha)
1.	Conversion production forest	183,53	168.312,04	-
2.	Production forest	1.966,49	406.812,99	3002,002
3.	Tanjung Keluang Tourism Park	3,21	283,24	-
4.	Tanjung Puting National Park	161,60	31.164,02	44.197,240
5.	Sebangau National Park	-	3,91	71.984,780
6.	Lamandau Wildlife sanctuary	81,83	1.893,36	-
7.	Conservation forest	58,53	232.151,48	11.002,520
8.	Cultivation area	467,79	50.743,81	38.486,150
Total		2.922,98	891.364,86	168.672,690
Percentage		0,27	85,85	15.86

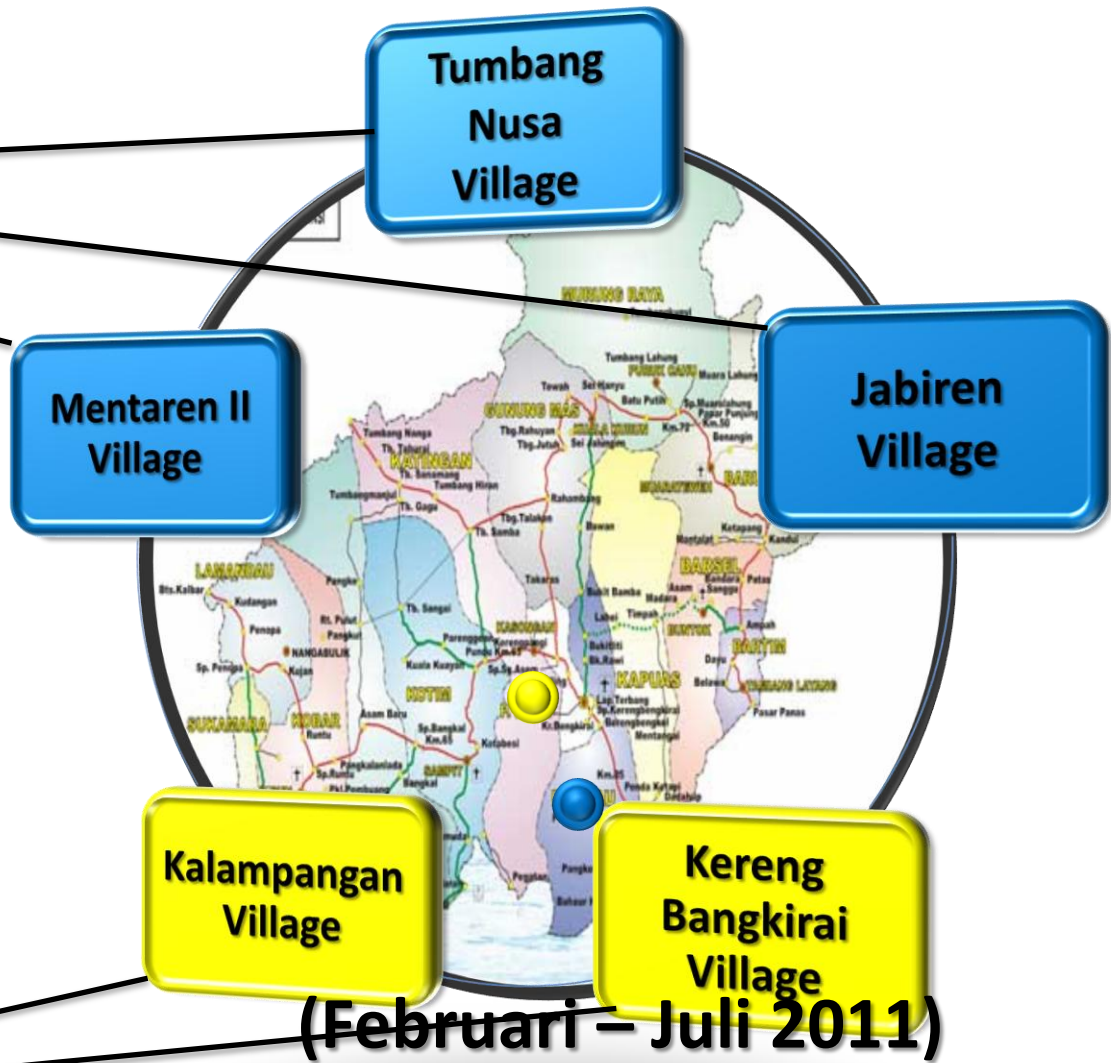
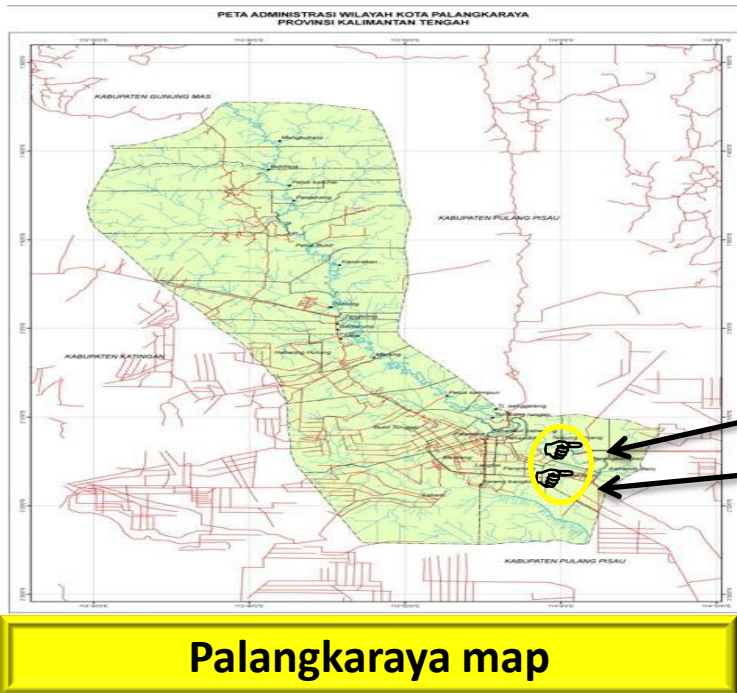
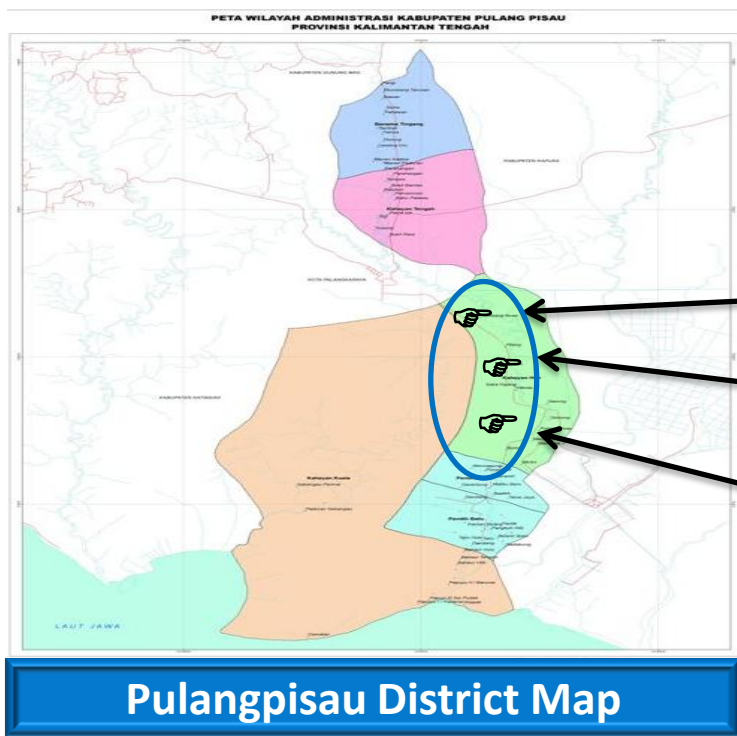


Why Jelutung ?

- *Dyera lowii*
- Indigenous tree species of peatland
- Protected
- Multipurpose tree (wood, latex)
- Alternative livelihood



Study Location



METHODS

No	Data	Data Source	Data compilation technique	Output
Technical Aspect				
1.	Silvicultural Technique for development of jelutung in Agroforestry system (Availability of seedling vegetatively and generatively, nursery, planting technique).	Primary	Field Observation, interview	Information on silvicultural technique of jelutung in agroforestry system.
		Secondary	Research report, journal, document	
2.	Performance of jelutung growth in agroforestry (height & stem diameter, growth , % replanting, % stem borer attack).	Primary	Field measurement	Information on jelutung growth in various agroforestry system(height & stem diameter, growth , % replanting, % stem borer attack).
		Secondary	Research report, journal, document	
3.	Elements of jelutung based agroforestry design in peatland.	Primary	Diagnosis method & Design	jelutung based agroforestry design in peatland
		Secondary	Research report, journal, document	

Environmental aspect

4.	microclimate in three land cover types : (a) jelutung agroforestry, (b) monoculture farming area, and (c) abandoned land.	Primary	Field measurement of T, RH, Tsoil, light intensity	Microclimate in various land cover types
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RESULTS



Table 1. Seed production in various identified seed source

No.	Owner of seed source	Production per year (seed)
1.	Hardianto	115.200.000
2.	KUD Kahimat Desa Pilang	1.440.000
3.	PT. Katingan Jaya Perkasa	2.664.000
4.	KUD Kahimat Desa Tumbang Nusa	5.616.000
5.	Ir. Soeyatno K. S.	2.000.000
Total		126.920.000

Seed supply from community cooperation and individuals in Central Kalimantan (assumption of seed viability of 80%) about 101,536.000 seed per year. Ready stock seedling for planting (assumption of survival percentage of 80 %): 81,228.800 seedling per year.

Seedling used for degraded peatland (assumption of death in transportation of 20% and the successful planting in the field of 80% with planting spacing of 5 x 4 m): 51,986.432 seedling for 103,972.86 ha degraded peatland area per year.





Nursery of jelutung developed by community in several villages: Tumbang Nusa, Taruna Jaya, Jabiren, and Hampangin. Tumbang Nusa is known as center for jelutung nursery with production of ready stock seedling about 1 – 3 millions per year.

Table 2. Agroforestry pattern in shallow and deep peat

Agroforestry pattern	Short description	Main component
Shallow peat		
<i>Alley cropping</i> with heap	Paddy planted on the alley, trees planted on the heap	Trees: rubber, jelutung. Seasonal crops: local paddy
<i>Alley cropping</i> with sunken beds	Paddy planted on the alley, trees planted on the raised beds	Trees: rubber, jelutung. Seasonal crops: local paddy
Agrosilvofishery	Fish pond, trees planted on the beds	Trees: rubber, jelutung, gaharu, manggo, and durian. Fruit plants: <i>salak pondoh</i> . Fish pond
Deep peat		
Mixcropping with ditch	Cultivation area surrounded by ditch sized 50 cm – 100 cm width and depth. Trees planted on strip alternately, spacing 7 mx7m. Seasonal crops planted surrounding ditch	Trees: jelutung and rambutan Seasonal crop: pineapple
Alley cropping with ditch	Land divided into blocks with ditch surrounding. Narrow blocks for trees, broader blocks for seasonal crops	Trees: jelutung Seasonal crops: vegetables (maize, long bean, brassica, leek, chilli).

Mentaren village



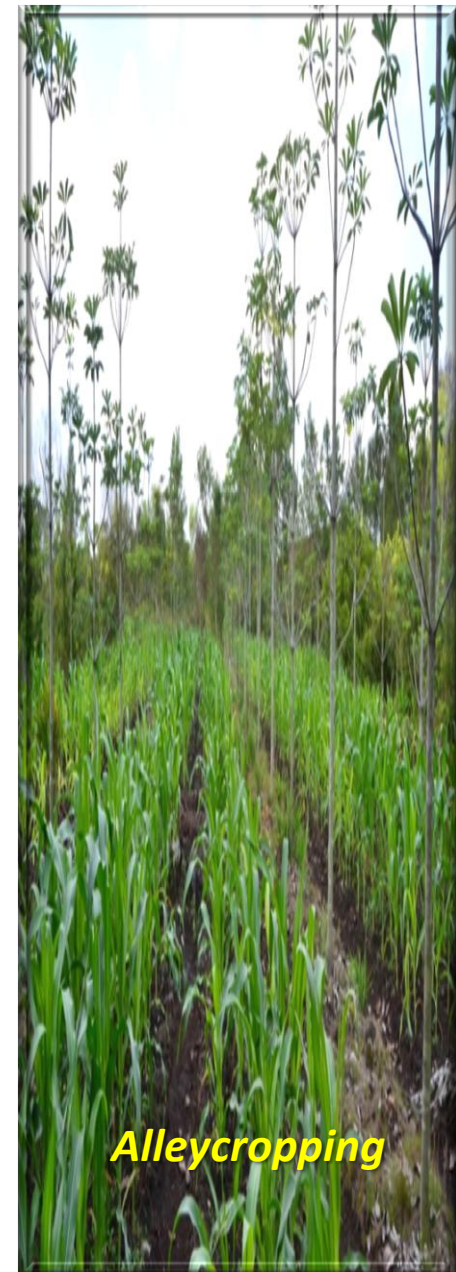
Jabiren village



Tumbangnusa village



Kalampangan



Growth Performance of jelutung in various types of peat and Agroforestry pattern

Location, land typology, and Agroforestry pattern	Age (year)	Growth of Jelutung (cm)			
		Mean Diameter	Diam. incrmnt/ year	Mean Height	Height incrmnt/ yr
Kalampangan village, deep peat , alleycropping with ditch technique	6,00	10,39	1,73	617,13	102,86
Kalampangan village, deep peat, alleycropping with ditchtechnique	5,25	8,69	1,66	454,38	86,55
Tumbang Nusa village, deep peat, mixcropping with ditch technique	5,30	10,11	1,96	626,70	116,03
Jabiren village, shallow peat, mixcropping	5,25	10,11	1,92	671,70	127,94
Mentaren II village, shallow peat (sulphate acid), agrosilvofishery	6,50	11,03	1,60	800,60	120,00
Mentaren II village, shallow peat (sulphate acid), alleycropping	6,50	13,98	2,15	716,18	110,18
Mentaren II village, shallow peat (sulphate acid), mixcropping	6,50	10,15	1,56	581,58	89,47
Average	5,90	10,64	1,80	638,32	107,58

Growth Performance of jelutung in Monoculture system

Parameter	Location			
	Jabiren I	Jabiren II	Hampangin	Tumbang Nusa
Age (year)	8	20	10	6
Mean Height (cm)	1.360	2.150	1.070	752,9
Mean diameter (cm)	5,6	20,5	12,1	11,82
Diameter increment/year (cm)	0,72	1,025	1,21	1,97
Height increment/year (cm)	170	107,5	107	125,48

Parameter Iklim Mikro	Kondisi Penutupan Lahan Gambut					
	Agroforestri Jelutung			Non Agroforestri Jelutung		
	Waktu Pengamatan					
	Pagi (08.00 – 09.00)	Siang (12.00 – 13.00)	Sore (16.00 – 17.00)	Pagi (08.00 – 09.00)	Siang (12.00 – 13.00)	Sore (16.00 – 17.00)
Lokasi Desa Kalampangan						
Suhu Udara Max/Min (°C)	33,7/33,1	35,6/35,4	33,2/32,8	37,3/29,6	39,4/39,0	35,8/35,3
Kelembaban Udara Max/Min (%)	79/58	54/49	58/55	49/43	52/48	55/49
Suhu Tanah (°C)	28	31	30	29	34	32
Intensitas Sinar Matahari (x 100 lux)	142	160	54	365	771	73
Lokasi Desa Tumbang Nusa						
Suhu Udara Max/Min (°C)	29,1/28,9	33,6/33,4	32,4/32,1	33,1/32,5	39,5/37,6	34,9/34,8
Kelembaban Udara Max/Min (%)	81/80	65/64	72/71	74/73	60/59	71/69
Suhu Tanah (°C)	26	31	29	27	34	34
Intensitas Sinar Matahari (x 100 lux)	136	195	68	153	840	78
Lokasi Desa Mentaren II						
Suhu Udara Max/Min (°C)	26,7/26,6	29,9/29,8	28,5/28,4	31,1/31	35,7/32,6	31,6/31,5
Kelembaban Udara Max/Min (%)	74/72	72/69	73/73	64/62	56/55	59/58
Suhu Tanah (°C)	25	28	27	28	33	31
Intensitas Sinar Matahari (x 100 lux)	18	63	23	321	563	486

CONCLUSIONS

1. Development of jelutung in agroforestry system to recover degraded peatland is technically feasible, with indicator of seed supply ability of 126.920.000 seed/year, ready planted seedling supply ability of 1 – 3 millions seedling/year
2. There are various agroforestry system patterns of jelutung developed by local communities which could be a lesson learned
3. Microclimate of jelutung agroforestry are better compared to agriculture monoculture.

Thank You

