Adoption of Agroforestry System as Suistanable Strategy for Coffee Production

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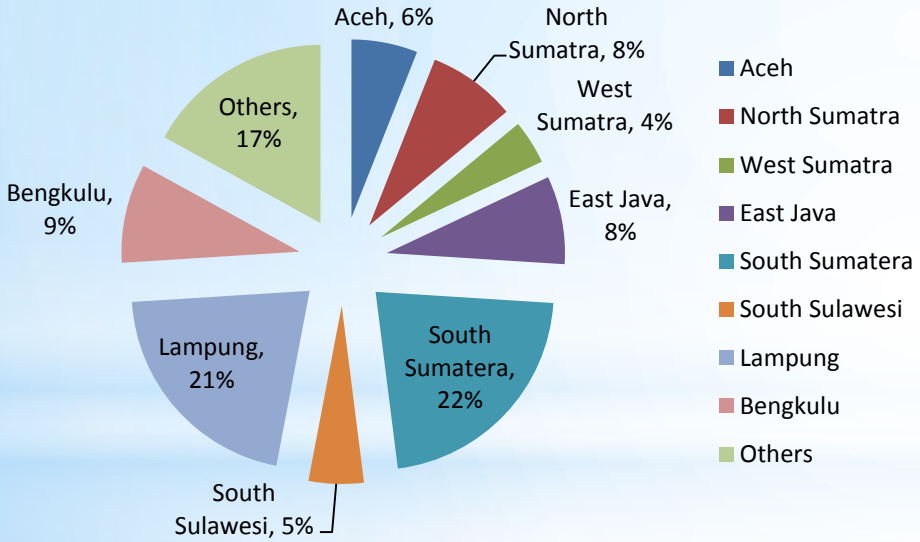
Outline:

1. *Background*
2. *Research problem*
3. *Methods*
4. *Result and Discussion*
5. *Conclusion*

Background

Background

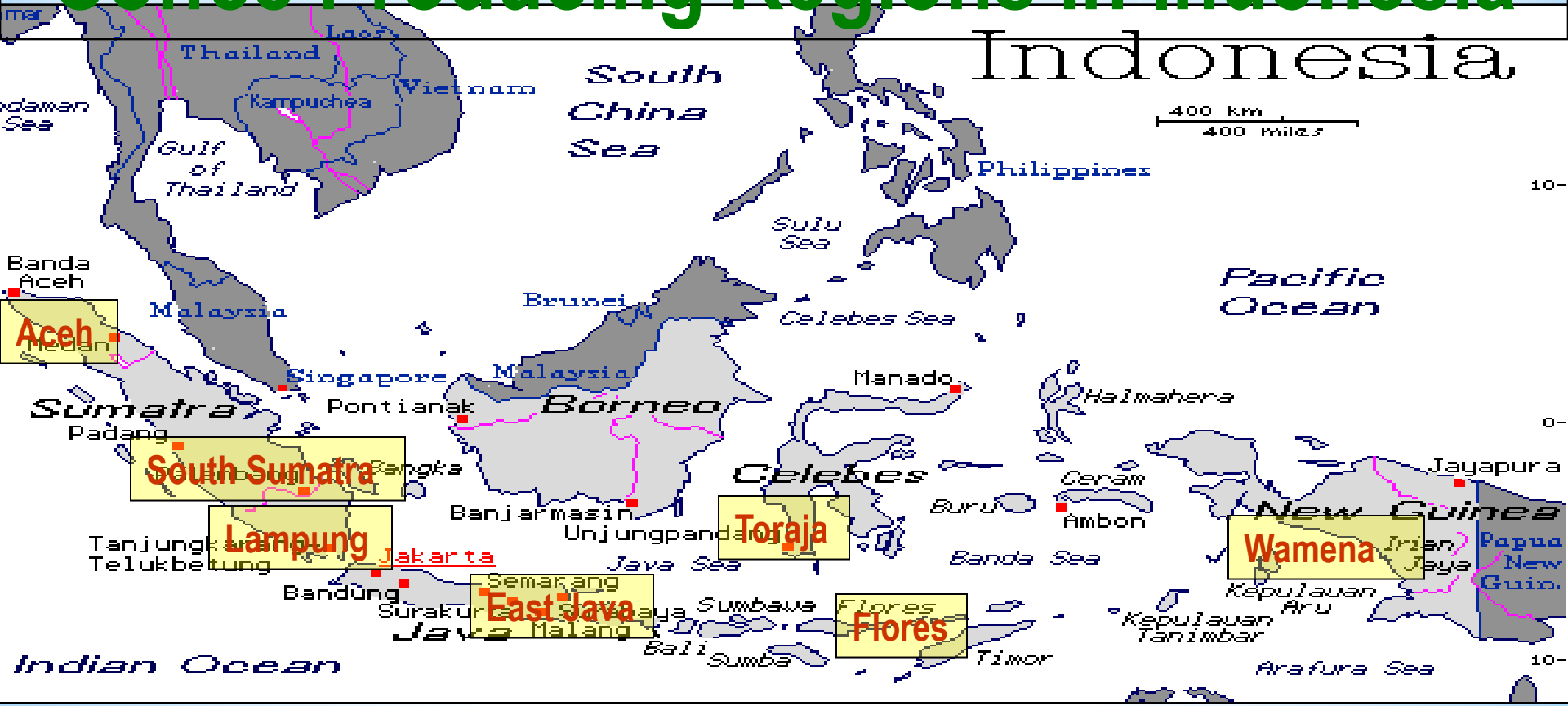
- Lampung is one of coffee production centre in Indonesia



- Lampung is the largest Robusta coffee production centre
- It concentrated in West Lampung (60.273 ha, (43,18%) and **Tanggamus District (44.330 ha (31.76%).**

Coffee production center in Indonesia, 2018
Source: BPS Indonesia, 2018

Coffee Producing Regions in Indonesia



The Indonesian Coffee Economy

* Indonesia is the **4th largest** coffee producer, after Brazil, Vietnam, and Columbia, but the **2nd largest** Robusta producer after Vietnam
* Total coffee production in 2017 was 674,636 tons, a bit increase from 668.636 tons of the production in 2016.
  * 85% of coffee is Robusta (mostly from Lampung and South Sumatra)
  * 15% of coffee is Arabica (from some highlands, but virtually all exported)
* Sustainability certification in coffee has grown rapidly in the last decade,

Research Problem

Problem of Sekampung Watershed

* The main watershed, major food baskets and agriculture exports area of the province,
* Land area: 484 ha (49% degraded, 34% potential to degrade 17% non-degraded)
* Soil erosion rate: 67.5 ton/ha/year, far higher the 25 ton/ha tolerable rate
*

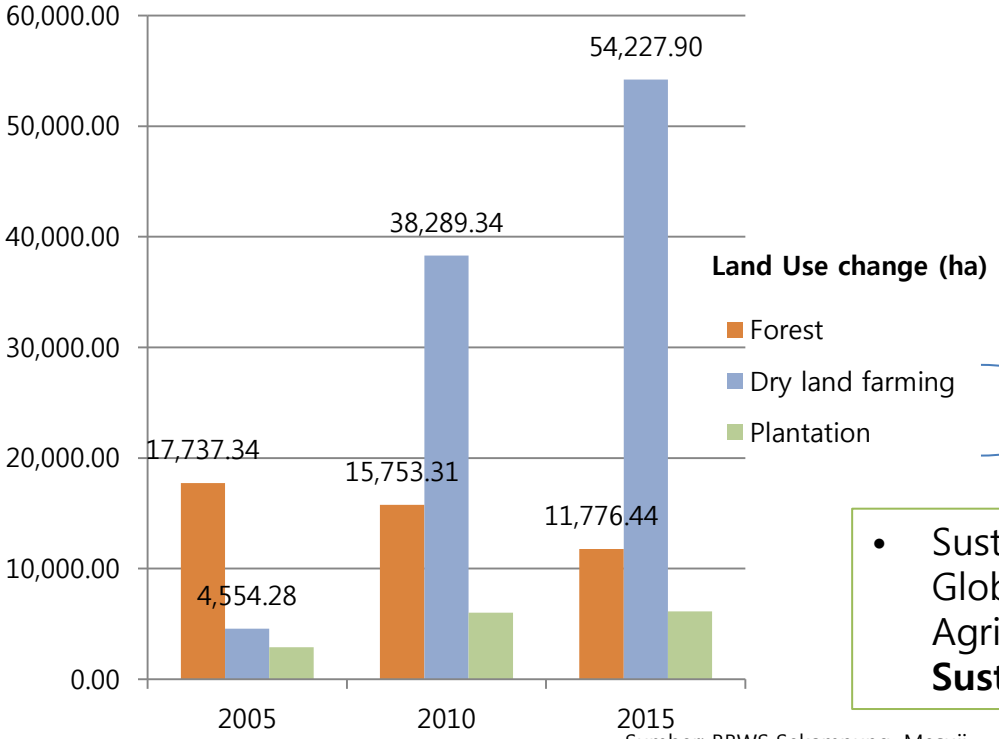
Coffee Farmers Problem

* Low coffee production
* Low coffee farming competitiveness
* Low coffee quality
* Bargaining position of farmers in local market are weak
* Welfare of coffee farmer households are low

Solution ⟶ Coffee farmers have to adopt agroforetry system

- Coffee production system mostly taken placed around forest and watersheds.
- Landscape changing (± 60% forest land at upstream Sekampung watersheds conversed to farm land and settlements)
- Upstream watersheds had threatened by land degrad**ation and deforestation.** →Land Degradasion → erosion → river sedimentation → Hydrological destruction
- Coffee production faced disruption by **Global climate change** → rainfall changing→ Ecological Risk (Flood and drought)

Land use change

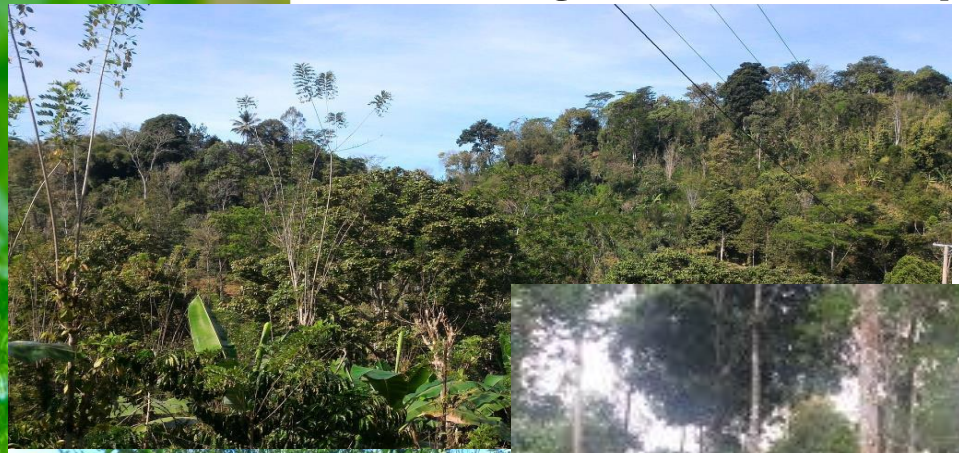


Sumber: BBWS Sekampung,-Mesuji

Sustainable Production??

- Sustainable development (SDG)➔ Global Sustainability Standard➔ Agriculture Sustainable System➔ **Sustainable Production**

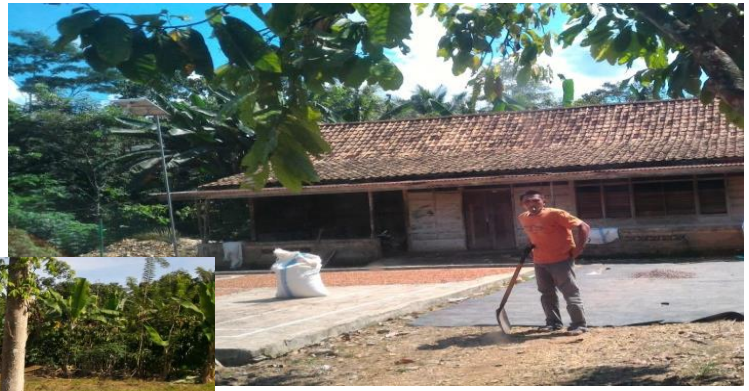
Coffee farming outlook in Upstream Sekampung watersheds



Coffee farming outlook in Upstream Sekampung watersheds

Erosion rate 67,5 ton.ha^{-1}.year^{-1} > 38,7 ton. ha^{-1}.year^{-1} (Nippon Koei, 2003 in Banuwa, et.al., (2008)

Coffee Farmer’s Condition

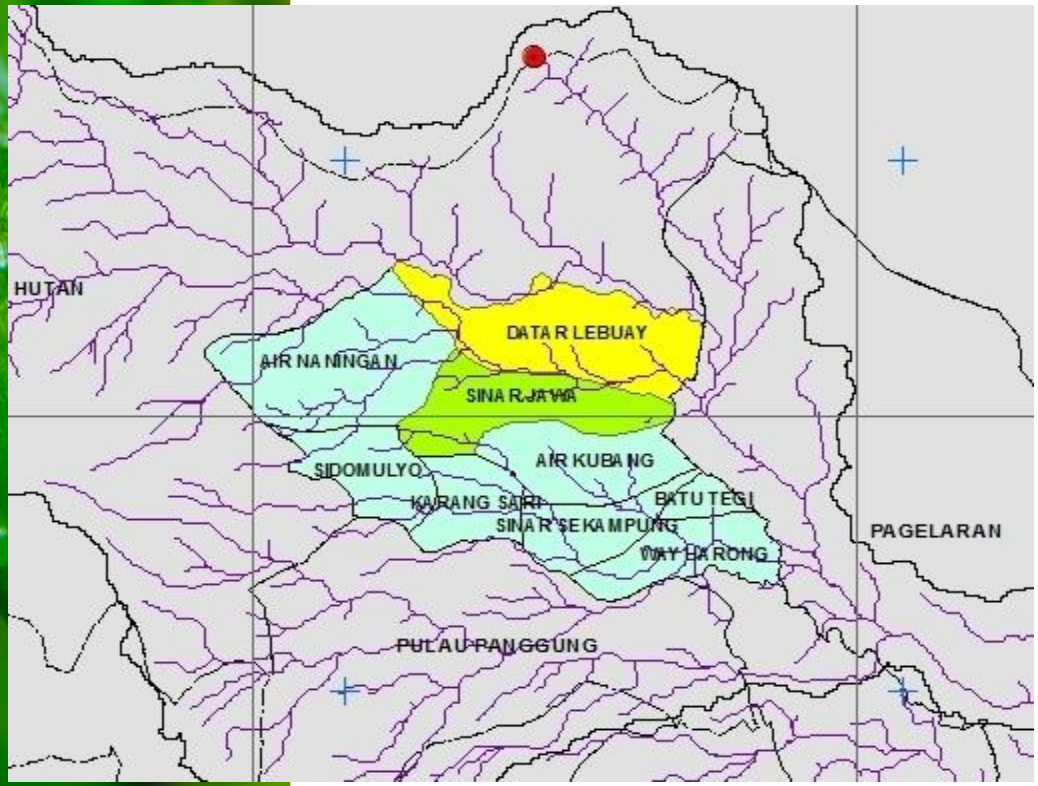




Do the coffee farming reach the sustainability?

METHOD

Methods

Site location

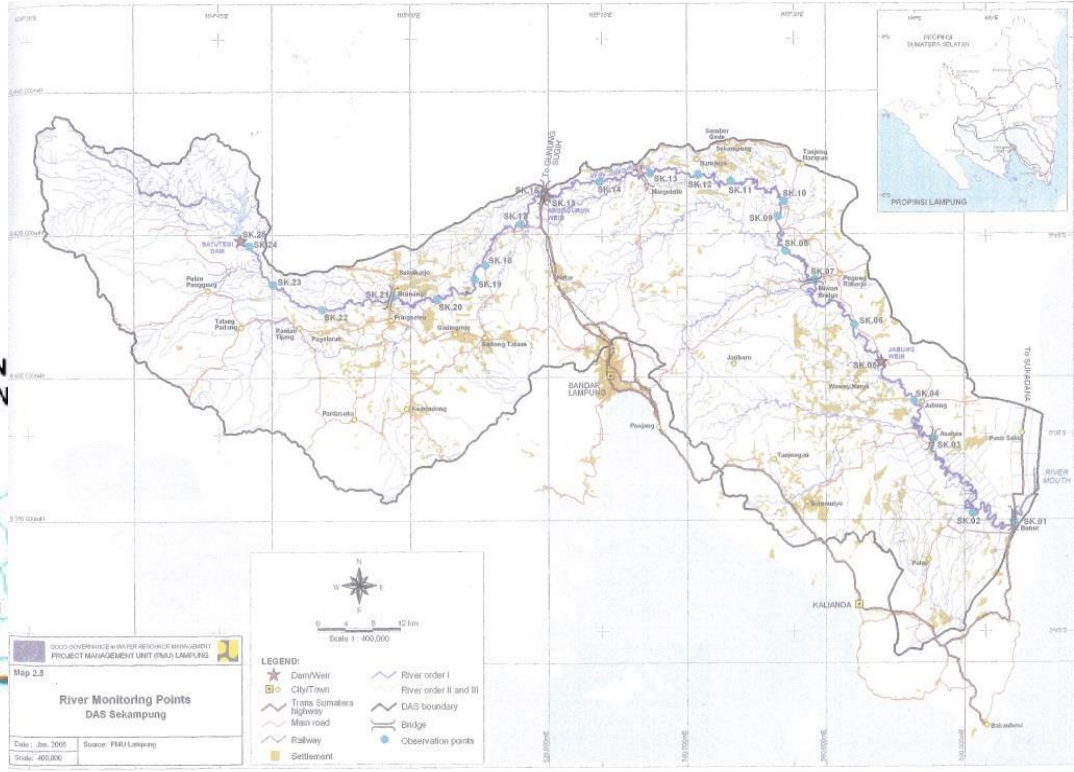


Sampling design:
Simple random sampling
Respondent 400 coffee farmers

Data Analysis:
Statistic Descriptive

Research Location

SEKAMPUNG WATERSHEDS

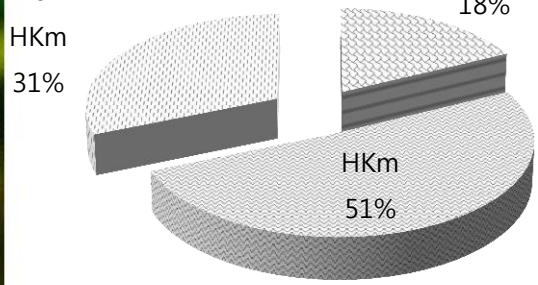


RESULT AND DISCUSSION

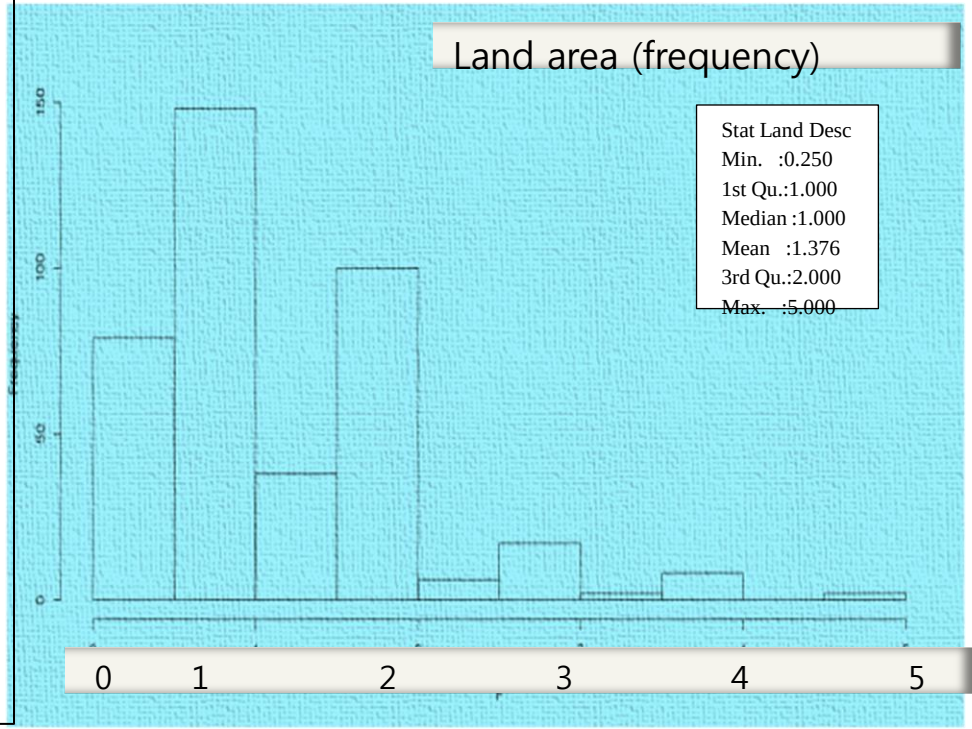
RESULTS AND DISCUSSION

Land Property Right

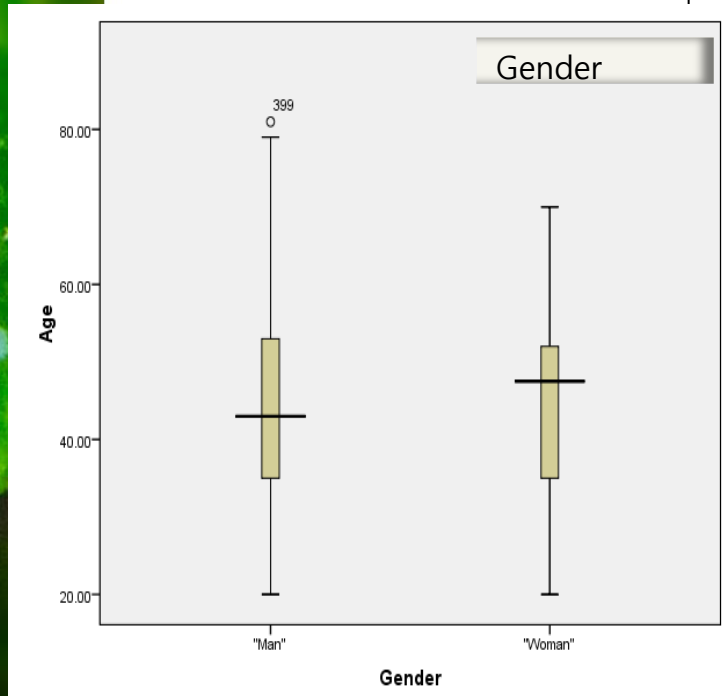
Land Tenure (%)

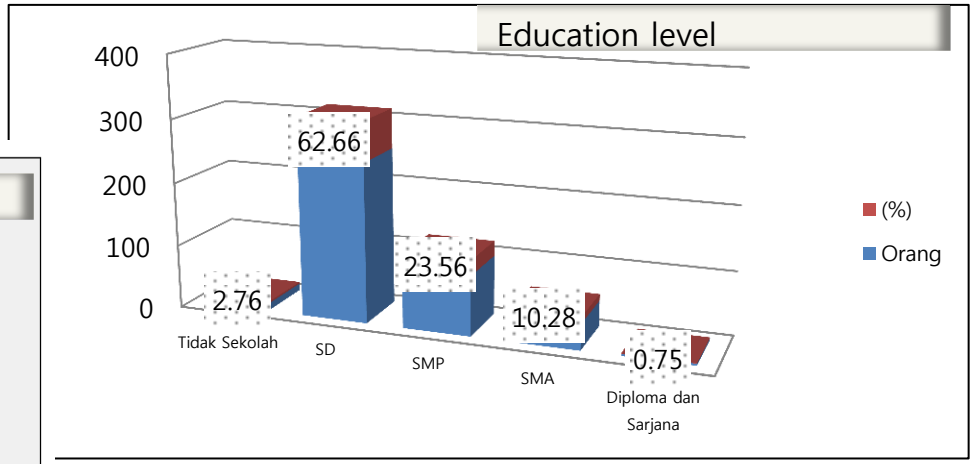


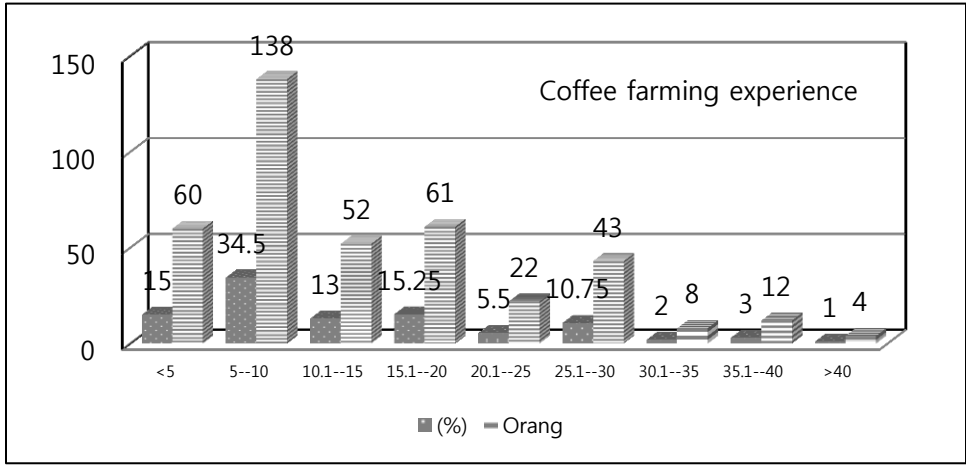
Land area (frequency)



Demographic

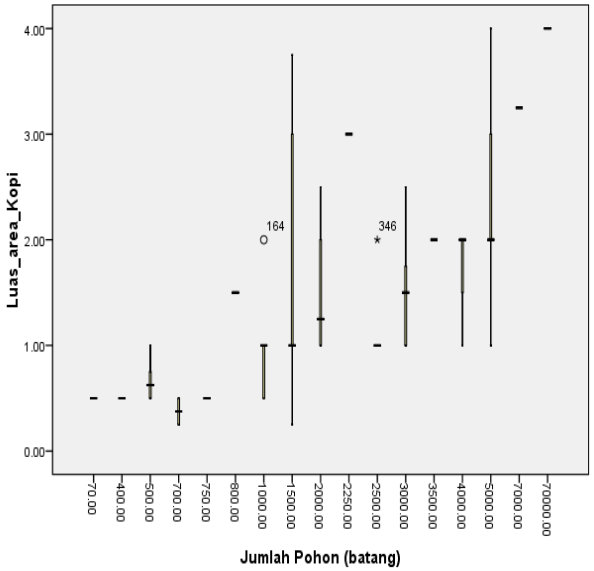




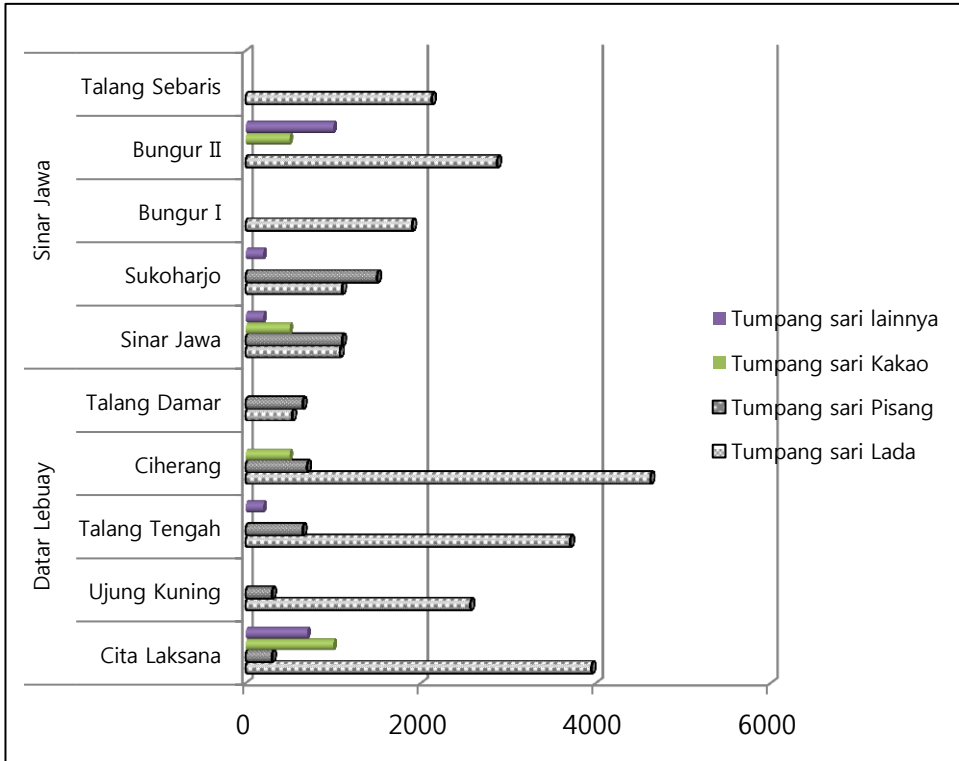


Coffee and multiple cropping plant per area

Coffee plant density per area

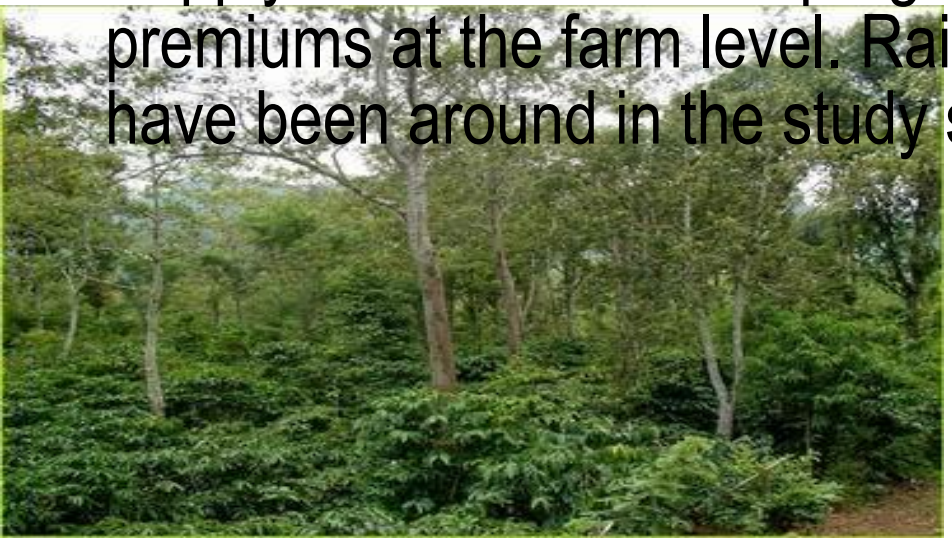


Multiple cropping in coffee land per ha



Multi-Strata Coffee Agroforestry System

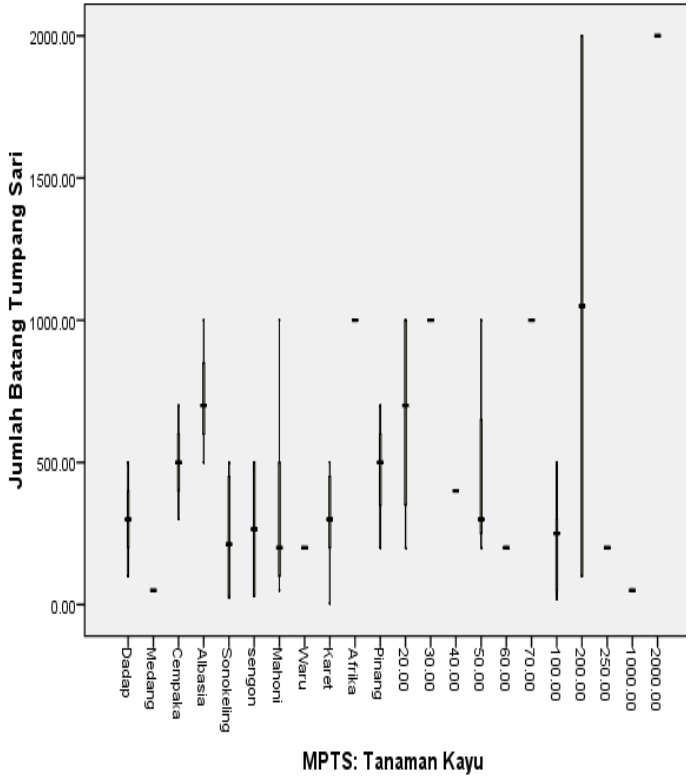
- In addition to securing household income, coffee-agroforestry system (shaded & multi-strata) could be seen as both forest stewardship and later as reward for environmental services.
- Supply chain certification programs have attempted to create price premiums at the farm level. Rainforest Alliance and 4C certificates have been around in the study sites for 5 and 2 years respectively.

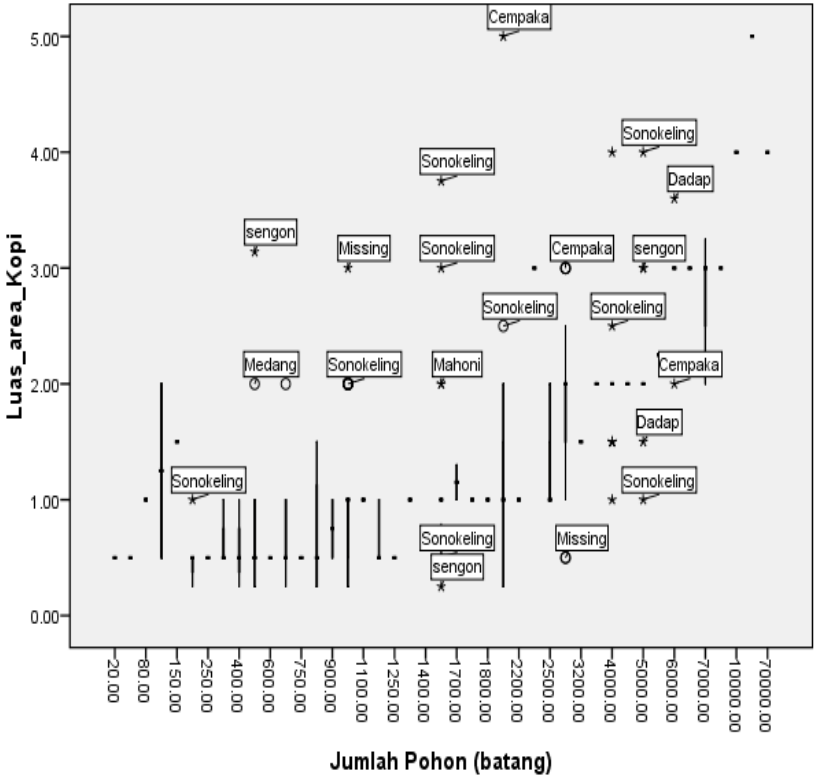


Shaded coffee

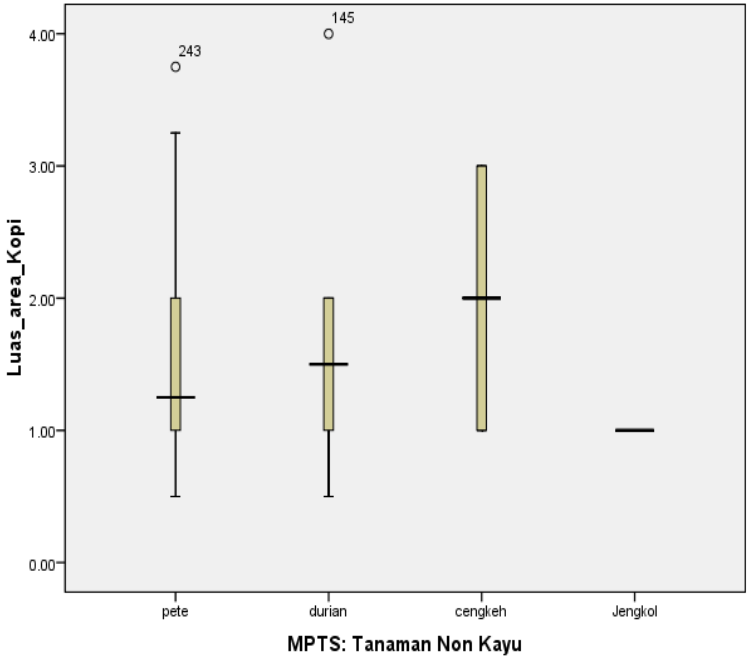
Multistrata coffee

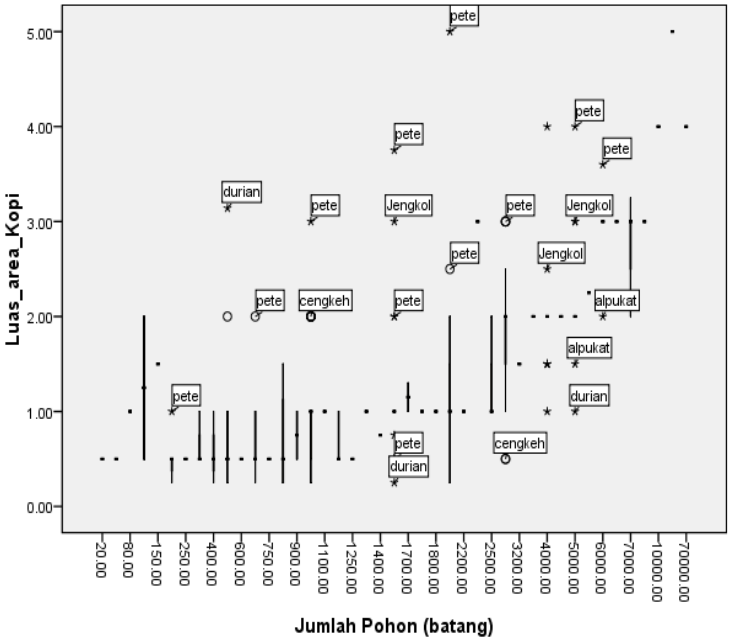
MPTS timber in coffee land



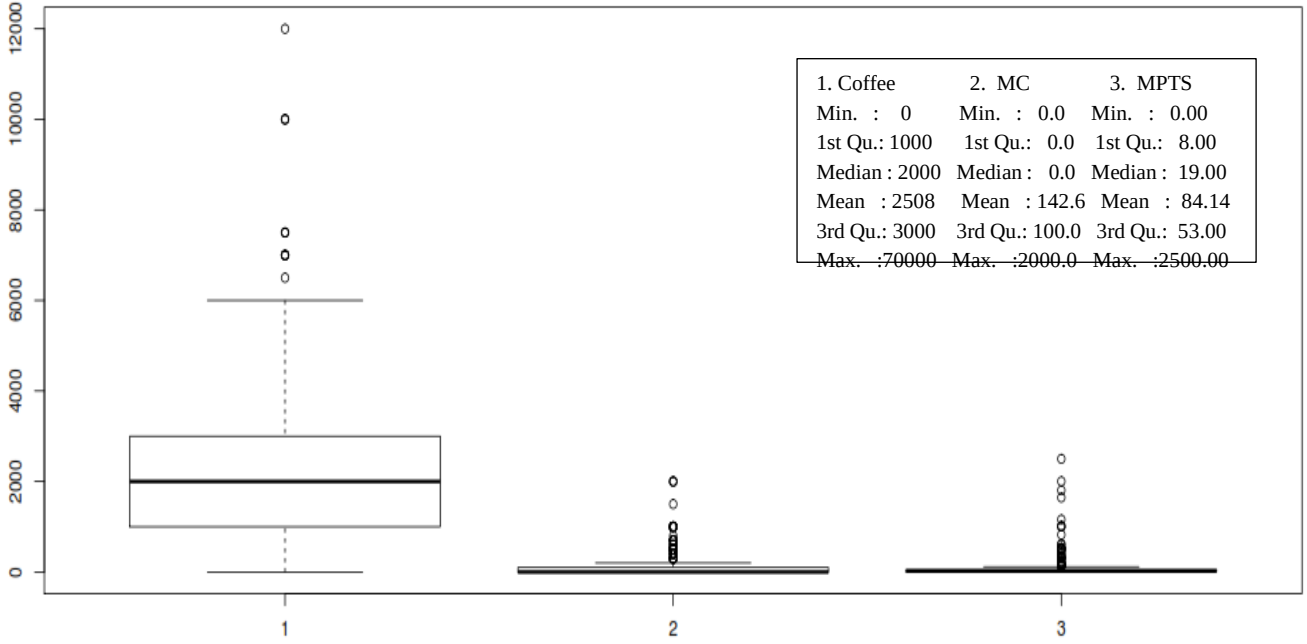


MPTS non-timber in coffee land



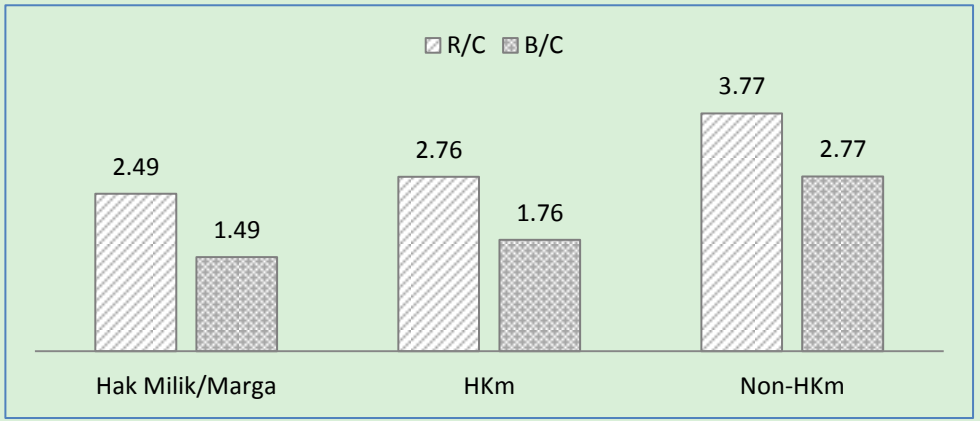


Coffee plant, multiple cropping, and MPTS in coffee land



Coffee Farming Analysis

Description	Status of Land Tenure		
	Hak Milik/ Marga	HKm	Non-HKm
Production (kg/ha)	358	317	73.46
Production Price (Rp/kg)	19,352	19,705	20126.40
Coffee Revenue (Rp/ha)	6,933,235	6,239,479	1,478,387.87
Main Cost			
Land rent (Rp/th)	1,000,000	1,000,000	
Fertilizer Cost	488,401	159,670	40,135
Pesticide Cost	454,577	390,686	172,146
Labour Cost	837,746	707,649	179,888
Total Cost (Rp/ha)	2,780,725	2,258,006	392,169
Coffee Income (Rp/ha)	4,152,510	3,981,473	1,086,219
R/C	2.49	2.76	3.77
B/C	1.49	1.76	2.77



Coffee farmer's income structure

Non-coffee Revenue	Proprietary/ Marga	HKm	Non-HKm
TS1 Revenue (Rp/ha)	34,529,572	13,470,305	7,925,141
TS2 Revenue (Rp/ha)	1,688,703	1,612,429	458,361
TS Coct	5,783,650	5,783,650	664,533
TS Income	30,434,625	9,299,084	7,718,970
MPTS1 Revenue (buah dll)	34,529,572	13,470,305	618,038
MPTS2 Revenue	1,688,703	1,612,429	201,560
MPTS Cost	2,039,566	981,812	664,533
MPTS Income	34,178,709	14,100,922	155,066

Income Source	Mean
Coffee Income (Rp)	6,379,524
Non-Coffee Income (Rp)	21,454,527
Farming Income Total (Rp)	27,270,856
Non-farming Income Total (Rp)	3,246,831
Household Income Total (Rp)	30,099,425
(%) Coffee Income Share to farming income total	24%
(%) kopi terhadap Pendapatan Total	22%

Conclusion

Coffee farming income contributed up to 24% toward household income. The main income source come from farming activity, including multiple cropping pattern and MPTS as shade trees in coffee land. This is call out as mix farming. The best practiced of coffee mix farming is represented the sustainable coffee production in upstream Sekampung watersheds. This fact is becoming evidence that coffee farming reached the sustainable production.