PARTNERSHIP FOR SUSTAINABILITY BETWEEN SMALLHOLDERS IN ASIA AND CORPORATIONS IN EUROPE

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OUTLINE OF PRESENTATION

INTRODUCTION: THE COFFEE ECONOMY

- Indonesia is the **4th largest** coffee producer, after Brazil, Vietnam, and Columbia, but the **2nd largest** Robusta producer after Vietnam
- Coffee production in 2019 was 729 thousand tons, a bit increase increase from 722 thousand tons of that in 2018.
  - 85% of coffee is Robusta (mostly Lampung and South Sumatra)
  - 15% of coffee is Arabica (from highlands, almost all exported)
- The majority (95%) of coffee farmers is smallholder (1 ha or less).
- Average Robusta yield: 560 kg/ha, below that in Vietnam & Brazil.

PARTNERSHIP FOR SUSTAINABILITY

- Smallholders have adopted coffee-agroforestry system, sources of additional income and basis of sustainability certifications.

- Global buyers are interested in improving the control mechanisms that ensure product quality to meet both technical and non-economic requirements of coffee beans for the global market.

- Partnerships with global coffee corporations are needed by small-holders, to ensure market access and product quality to meet global requirements, to increase access for information, technical assistance, empowerment and other capacity building programs.

OBJECTIVE

- To analyze the institutional dimensions of partnership for sustainability between smallholder farmers in Asia and large-scale corporations in Europe and examines the impacts of partnerships on farm income in Lampung Province, Indonesia.

METHODOLOGY

- The sampels consist of 78 farm households in West Lampung District (35 farmers in partnership & 43 non-partnership) and 93 farm households in Tanggamus District (63 farmers in partnership & 30 non-partnership)
- The Nestle corporation's 4C certification scheme is dominant in Tanggamus and Ecom corporation's Rainforest Alliance (RFA) certification is dominant in West Lampung. By then, Nestle started buying coffee in West Lampung.
- The samples were selected randomly within the cluster, using the lists provided by the Head of Village, Internal Control System (ICS) agents of these 2 companies.

ANALYTICAL FRAMEWORKS (1)

(1) Probit model to estimate factors determining partnership participation

$$z_j^* = w_j\gamma + u_j \quad \text{...} \quad (1)$$

$$z_j = \begin{cases} 1, & \text{if } z_j^* > 0 \\ 0, & \text{others} \end{cases}$$

z_j = participation in partnership (y=1 partner farmer; y=0 non-partnership farmer)

w_j = variables that affect farm household's decision to join the partnership

(2) OLS model to estimate factors determining farm income

$$y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \delta z_j + \cdots + \beta_k x_k + e_j \quad \text{.....................................} \quad (2)$$

y = farm income (Rp)

x = variables or regressors that affect a farm household's decision to join the partnership

z = partnership (dummy, where 1 = partnership, 0 = non-partnership)

$\beta_1, \beta_2\beta_3, ..\beta_k$ = estimated parameter

e = error term

ANALYTICAL FRAMEWORKS (2)

(3) Treatment-effects model to correct the possible selection bias

Estimates γ are used to estimate the inverse Mills ratio IMRs (λi):

$$\lambda \equiv \frac{\phi(x\delta_1)}{\Phi(x\delta_1)}$$ …………………………………………………………..…………. (3)

The simultaneous Heckman selection-correction model is used to estimate equation (2) by inserting the λ_i variable into the equation as follows:

$$y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_n x_n + \delta z_j + \beta\lambda_i + v_j$$ …………………………………………………….. (4)

y = farm income (Rp)
x = variables or regressors that affect farm household's decision to join the partnership
z = partnership dummy (where 1 = partnership, 0 = non-partnership)
λ = inverse Mills ratio
$\beta_1, \beta_2 \beta_3, .. \beta_k$ = estimated parameter
v = error term

TWO FORMS OF PARTNERSHIP
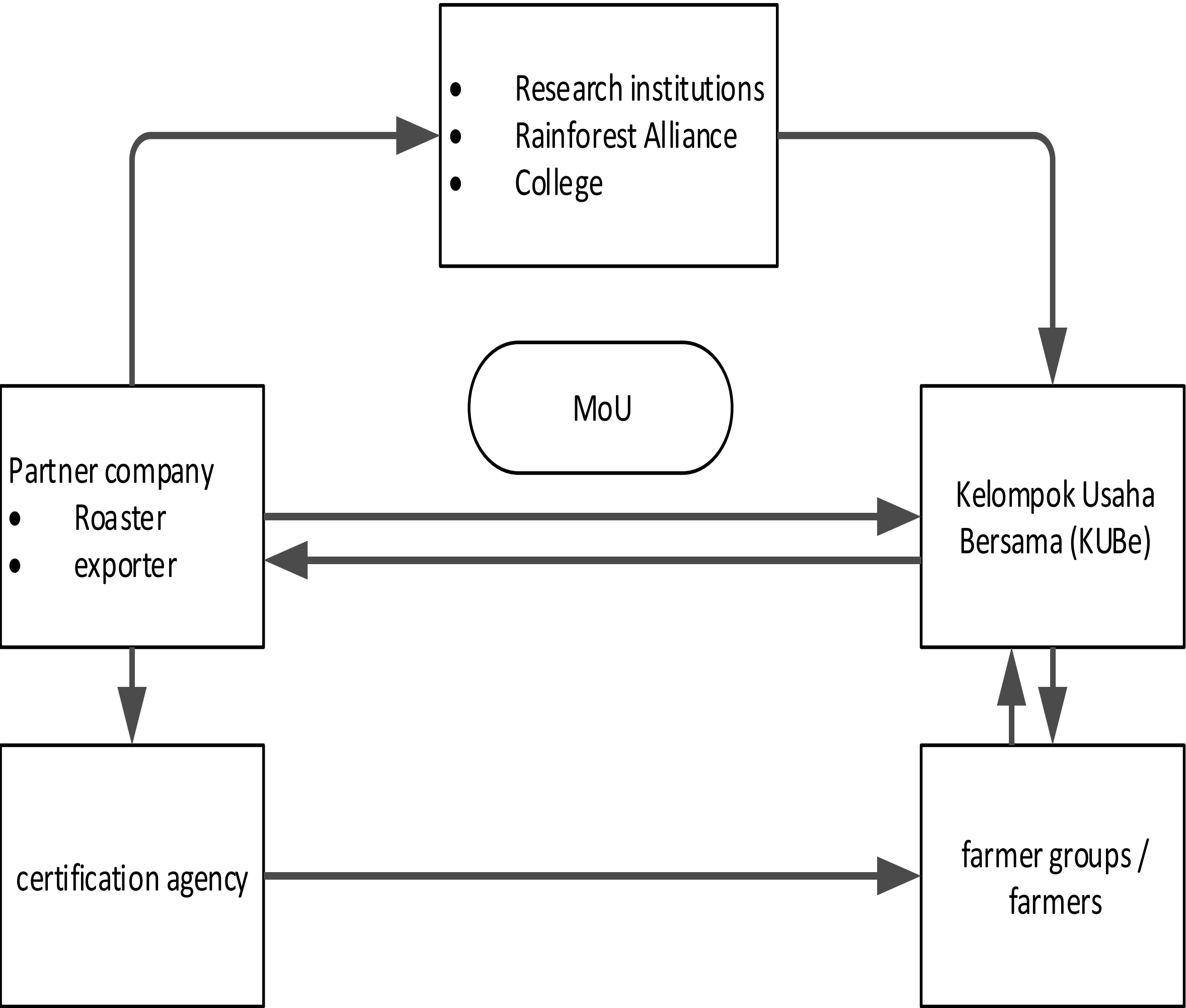
A. Sub Contract Partnership Pattern
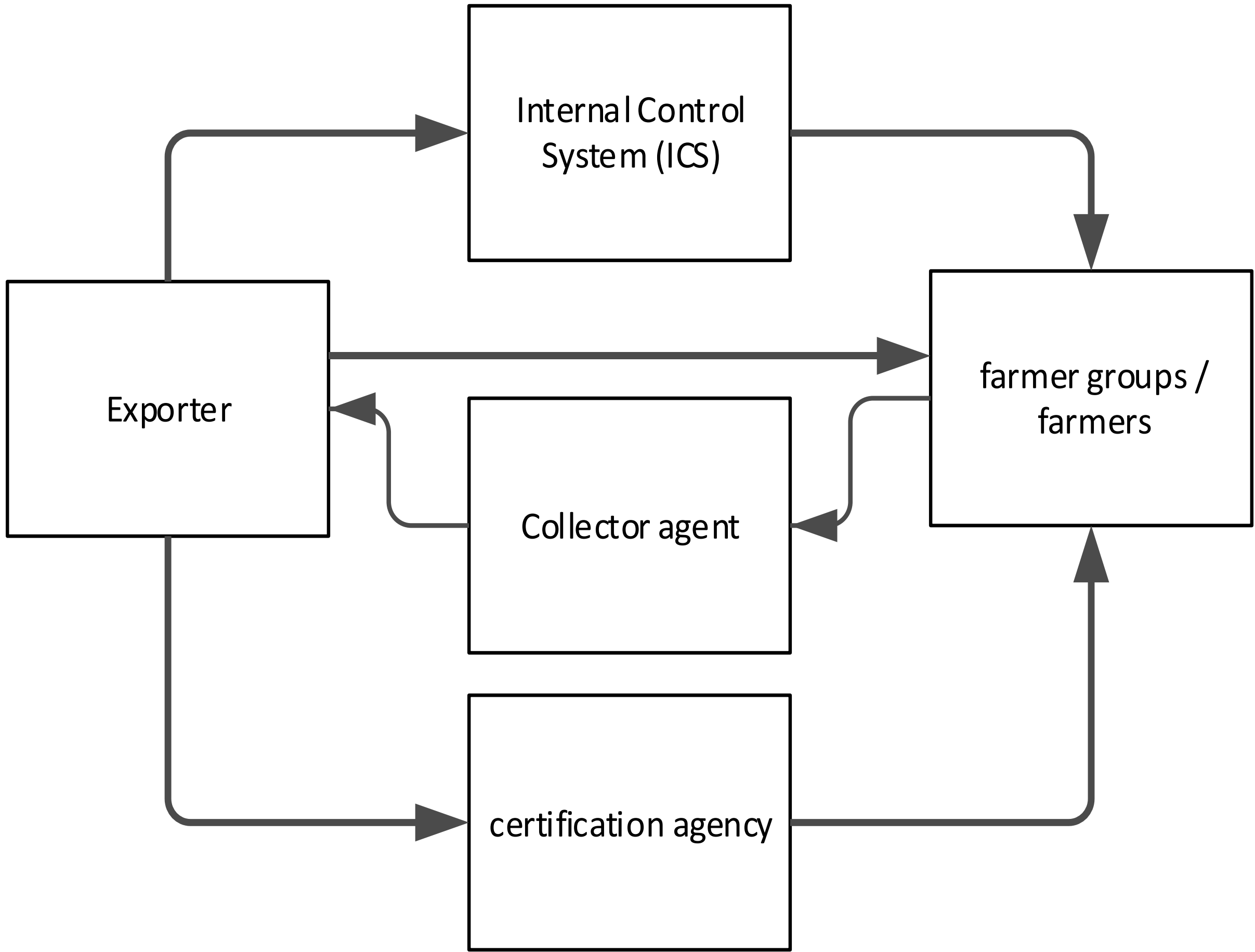
B. Pattern of general trading partnership

CHACTERISITCS OF COFFEE FARMERS

Description	District of West Lampung			
	Partnership: 35 farmers		Non-Partnership: 43 farmers	
	Range	Average	Range	Average
Age (year)	30 - 65	46.54	25 - 75	46.53
Education (year)	0 - 16	9.54	6-12	8.23
Farm experience (year)	4 - 40	21.49	4 - 49	22.00
Family size (person)	2 - 7	3.63	1 - 6	3.67
Under 5 years (person)	0 - 2	0.29	0 - 1	0.30
School age (person)	0 - 3	1.09	0 - 2	0.95
Senior age >65 year ([person)	0	0.00	0- 2	0.19

Description	District of Tanggamus			
	Partnership: 63 farmers		Non-Partnership: 30 farmers	
	Range	Average	Range	Average
Age (year)	23 - 69	38.86	29 - 78	46.07
Education (year)	0 - 16	9.13	3 - 12	8.50
Farm experience (year)	3 - 51	16.62	3 - 50	20.37
Family size (person)	2 - 5	3.49	3 - 8	4.37
Under 5 years (person)	0 - 1	0.35	0 - 2	0.47
School age (person)	0 - 2	0.84	0 - 3	1.27
Senior age >65 year ([person)	0 - 1	0.06	0 - 1	0.14

SUMMARY OF FARMING PERFORMANCE

Descriptions	Coffee Farmers	
	Partnership	Non-partnership
District of West Lampung		
Productivity	786.57 kg/ha	685.62 kg/ha
Farm-gate price	24,469 Rp/kg	23,267 Rp/kg
District of Tanggamus		
Productivity	685.24 kg/ha	468.51 kg/ha
Farm-gate price	22,656 Rp/kg	20,603 Rp/kg

RESULTS OF PROBIT MODEL

Variable	Coefficients	SE	P[|Z|>z]
Dependent variable: Partnership participation (dummy)			
Age of household head (years)	-0.025008	0.012660	0.048**
Education of household head (years)	0.080230	0.041486	0.053**
Family size (persons)	-0.280184	0.119672	0.019**
Share of family member 15-65 years (%)	-0.000520	0.007016	0.94
Share of family member >65 years (%)	-0.017399	0.017335	0.32
Holding size of coffee farm (ha)	0.570411	0.249812	0.022**
Holding size of total agriculture land (ha)	-0.237247	0.167195	0.16
Ownership of motorcycle (units)	0.171121	0.118368	0.15
Ownership of car (units)	-0.353176	0.333668	0.29
Ownership of coffee processing equipment (units)	-0.125318	0.231967	0.59
Distance of KUBE-cooperatives (km)	-0.023985	0.007529	0.001***
Distance of collector traders (km)	-0.030655	0.051160	0.55
Income share from coffee farm (%)	0.021093	0.004936	0.00***
Crop diversification-MPTS (dummy)	-0.149881	0.528044	0.78
Constant	0.800947	1.156478	0.49
LR test of Independent equation			
Chi-Squared (14)		60.41	
Probability>Chi-squared		0.00	
% correct predictions		74.85%	

- Age and education of the household head, the land holding size of the coffee farm and distance to rural cooperatives-KUBE are significantly higher for partnership farmers, reflecting a more mature character of farmers.

- Distance to KUBE is a strong predictor of participation in the partnership for sustainability certifications.

- There is some selection in becoming a partnership coffee farmer, rather than the number of multi-purpuse tree species (MPTS) in the coffee farms.

TREATMENT EFFECTS MODEL ON PARTNERSHIP

Variable	Coefficients	SE	P[|Z|>z]
Selection equation			
Dependent variable: Farm income (Rp/ha)			
Age of household head (years)	54086.2	89785.2	0.55
Education of household head (years)	-584681.6	287461.8	0.042**
Family size (person)	1746764.0	863156.3	0.043**
Share of family member 15-65 years (%)	113814.2	50648.2	0.025**
Share of family member >65 years (%)	54488.1	92759.7	0.56
Holding size of coffee farm (ha)	-3989568.0	1745324.0	0.022**
Holding size of total agriculture land (ha)	1880220.0	1122315.0	0.094*
Ownership of motorcycle (unit)	-1338905.0	824941.5	0.11
Ownership of car (unit)	-359873.1	2475715.0	0.88
Ownership of coffee processing equipment (unit)	-312660.5	1675775.0	0.85
Distance of KUBE-cooperatives (km)	92453.0	54337.6	0.089*
Distance of collector traders (km)	118913.1	426844.9	0.78
Crop diversification-MPTS (dummy)	-2040590.0	3868977.0	0.60
Partnership (dummy)	13700000.0	1937901.0	0.00***
Constant	-1794142.0	8386664.0	0.83
ath(ρ)	-0.9314663	0.1367332	0.00***
LR test of Independent equation			
Wald chi2(15)		66.80	
Probability>Chi-squared		0.00	
Number of Observation		171	
Selected Observation		98	

Variable	Coefficients	SE	P[|Z|>z]
Outcome equation			
Dependent variable: Farm income (Rp/ha)			
Age of household head (years)	54086.2	89785.2	0.55
Education of household head (years)	-584681.6	287461.8	0.042**
Family size (person)	1746764.0	863156.3	0.043**
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Probability>Chi-squared		0.00	
Number of Observation		171	
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INTERPRETING THE RESULTS

AESCON

- Income of coffee farmers is positively affected by the proportion of productive family members and being a partnership farmer.

- The coefficient for the partnership variable of 3,754,036 means that being a partnership farmer increases farm income by Rp 3.75 million or $ 269.70, which is a large premium.

- The variables that significantly affect income level are education of household head, family size, the proportion of productive family members, land holding size for coffee and agricultural land, and distance from the house to rural cooperatives-KUBE.

- The parameter *mils lambda* or the correlation between error terms in the selection and outcome equation is -0.93 and it is highly significant. There is a selection bias in the model.

- Farm income of partnership farmers is about Rp 13.7 million (or US$ 985.24) higher than for non-partnership farmers.

CONCLUSIONS

- The institutional arrangements of the partnership between smallholder farmers and corporations are manifested by the effectiveness of ICS.

- The ICS and KUBE connect the incentive systems for smallholders to perform well in meeting the standards of good agricultural practices (GAPs) and opportunities for coffee corporations in securing the supply of coffee beans and the quality requirements for the global markets.

- Partnership for sustainability certifications raises income through better farm-gate prices, higher yields, more crop diversifications or MPTS, better value chains, or some others. Higher income among coffee partnership farmers is brought about by higher coffee yields and farm-gate prices.

- The farm cost components are higher among non-partnership farmers, because of higher imputed expenses for family labor. Total farm income from partnership farmers is higher than that of non-partnership farmers.

RECOMMENDATIONS

- The public policy should establish a clear legal framework with written codes of conduct and other consensus provisions that benefit both smallholders and global coffee corporations.

- The ICS of global corporations in implementing sustainability have affected the trust level between smallholders and corporations.

- The study calls for further research on transaction costs of joining a partnership for sustainability in the coffee value chains.

- The sophistication of partnership rules, contracts and regulations might be quite specific by crop, geographic characteristics and value systems among the smallholders and global corporations.