Oil Palm and Regional Economic Development

Vijesh Krishna
University of Goettingen, Germany

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Rapid expansion of oil palm area

(Vijay et al., 2016)
Oil palm expansion is often criticized as causing deforestation in Indonesia

(Source: International Business Times, 2016)
Oil palm plantations provide inferior ecosystem services compared to the forest.

Clough et al 2017 Nat Commun.
Despite deforestation, Indonesia became the number 1 producer of palm oil.

39%: Increase in oil palm area in the world over 2003-2014

~80%: Global palm oil production comes from Indonesia and Malaysia

2 → 7 million ha: Increase in oil palm area in Indonesia over 2000-2013.

44%: Oil palm area managed by smallholders in Indonesia

Source: FAOSTAT
Rapid expansion of oil palm is often justified on grounds of faster economic development.

GNI and Poverty in Indonesia (estimated from World Bank datasets)

40%
Increase in the share of global GDP from Indonesia (2000-2015)
Source: IMF

110
Country rank with respect to HDI in 2014

+0.8%
Approximate annual change in HDI (2000-2014)
The socio-economic effects of oil palm expansion is hardly quantified.

• Does oil palm increase livelihood standards of rural households?

• Differential input (factor) requirements could be leading heterogeneous impacts in the rural society.
Study area: Jambi Province, Sumatra

Land use in Jambi (1990)

Source: Landsat images from Melani et al. (Unpublished)
Study area: Jambi Province, Sumatra

Land use in Jambi (2013)

Source: Landsat images from Melani et al. (Unpublished)
Adoption of oil palm among smallholders in Jambi

![Graph showing adoption of oil palm over time among independent non-migrant, independent migrant, and supported smallholders.]

In 2012, oil palm adoption was:

- **22%** among non-migrants
- **29%** among non-supported migrants
- **54%** among supported migrants

Source: Farm survey data
Factor input requirement of different land uses

Land productivity (million IDR/ha)

Plantation age

Source: Farm survey data
Livelihood Effects of Oil Palm Adoption
(Change in the consumption expenditure of farm households due to oil palm adoption)

Modelling was conducted in two steps – excluding labor availability variables (step 1) and including them.

<table>
<thead>
<tr>
<th></th>
<th>Estimated PACE [million IDR/AE]</th>
<th>Average treatment effect (%)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Adoption</td>
<td>Non-adoption</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
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<tr>
<td>Adopters</td>
<td>15.8</td>
<td>13.4</td>
</tr>
<tr>
<td>Non-adopters</td>
<td>14.3</td>
<td>12.2</td>
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</table>
Robustness of the estimates?

Market price of rubber and oil palm products fluctuate over time.
Robustness of the estimates
(Changes in the consumption effects of oil palm)

- Year 2012
- Year 2015
- Direct effect
- Spillover effect

Welfare effects (%)

95% CI  90% CI

Random effects
Ordinary least squares
Spatial models
Full model
Excl. business
Excl. farm size
Year 2012
Year 2015
Direct effect
Spillover effect
Oil palm is beneficial for smallholders.

- A major reason for farmers’ adoption decision: oil palm is less labor-intensive.
- At least half of the total benefits from oil palm adoption: indirect gains from labor-saving.
- Living standard effects of oil palm adoption depend on individual factor (esp. land and labor) endowments.
- Results suggest that emerging environment-friendly policies should more explicitly consider social heterogeneity.
- Research on-going: Estimating the spill-over effects of land use changes (e.g. impact on labor households).
Effect of oil palm on rural development

- Oil palm has on average positive effects in smallholders of Jambi Province.
- The economic effects of oil palm could vary between farm and non-farm households.
- The magnitude could vary depending on the competing crop.
- Using Potensi Desa (PODES) data and Tree Crops Statistics from 2000-2014, we estimated the effect of oil palm expansion on village amenities.
- The estimation was done at the regency level.
Villages where oil palm came up btw. 2000-2014 were less-developed in 2000.

Source: Estimated from PODES 2000
Percentage of rural households with electricity connection in regencies

Source: Estimated from PODES datasets
After “fixing” other regency characteristics, the oil palm expansion is found having a positive effect on rural development.
EFFoRTS

Ecological and Socioeconomic Functions of Tropical Lowland Rainforest Transformation Systems (Sumatra, Indonesia)

http://www.uni-goettingen.de/en/310995.html
Thank you!
Growth in the plantation sector