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PROGRESS REPORT

3rd INTERNATIONAL WORKSHOP ON TRANSITIONS TO SUSTAINABLE FOREST MANAGEMENT & REHABILITATION IN ASIA-PACIFIC REGION
KUNINGAN, WEST JAVA: 23-28 MARCH 2013

By

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MALAYSIA REPORTING FORMAT
(as agreed at the 2nd Workshop in KL Malaysia 2012)

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References

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A. Forest Management for Sustainable Timber Production: An Achievable Goal for Malaysia?

B. Determinants of Deforestation in Peninsular Malaysia

Drivers of Deforestation

- Agricultural land development remained into the 1980s but in 1990s
  - diminished in Peninsular Malaysia due to a shift to industrialisation
  - still widespread in Sabah and Sarawak.
- Deforestation in
  - Peninsular Malaysia was closely associated with agricultural expansion schemes (from 1908-32, and oil palm from 1966-84)
  - Sabah and Sarawak initially more closely related to commercial logging activities with agricultural expansion schemes only gaining momentum after the late 1970s.

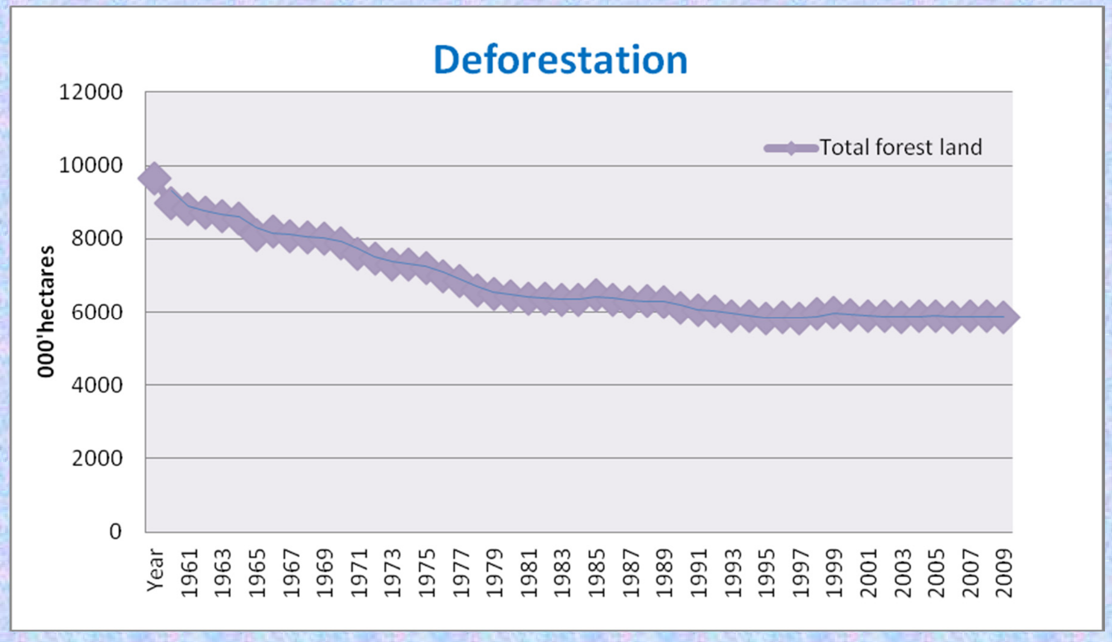
Malaysia: Trends in Total (Net) Forest Cover, 1990-2010

TOTAL FOREST COVER (1000 ha)			
1990	2000	2005	2010
22376	21591	20890	20456

ANNUAL CHANGE RATE (1000 ha) *Negative number represents deforestation*		
1990-2000	2000-2005	2005-2010
-79	-140	-87

ANNUAL CHANGE RATE (percent) *Negative number represents deforestation*		
1990-2000	2000-2005	2005-2010
-0.36	-0.66	-0.42

Peninsular Malaysia forest area for the year 1960 – 2010 (ha)



Research Objective

- **General objective :**

➢ **empirically examine what are underlying significant causes of deforestation in Peninsular Malaysia,**

- **Specifically the objectives are to:**

➢ **Estimate an econometric model of factors influencing deforestation in Peninsular Malaysia and to determine the short-run and long-run effects of the economic determinants of tropical deforestation.**

➢ **To test whether the loss in forest cover follows an inverted U-shape relationship Environmental Kuznets Curve (EKC) between income per capita and deforestation**

LITERATURE REVIEW

Researchers	Country	Evidence Analysis
DeFries ,Rudel, Uriarte , & Hansen (2010)	Africa, Asia and Latin America	Urban population growth is positively associated with forest loss. although at different levels
Epule, Changhui, Laurent, and Zhi Chen (2011)	Cameroon	Population is the most significant cause of deforestation in Cameroon linear regression model.
Culas (2006)	Latin American, African and Asian	- It was predicted that a high GDP per capita could stimulate demand for agricultural and forest derived products that could caused deforestation. - Yet at a level of high GDP per capita can reduce deforestation as forest is protected from extinction

LITERATURE REVIEW

Researchers	Country	Evidence Analysis
Koh & Wilcove (2008)	Malaysia	In 1990–2005, around 55% and 59% of oil palm expansion was due to forest conversion, and also between 41% and 45% of oil palm expansion was likely due to conversion from pre-existing agricultural land such as rubber plantations.
Angelsen and Kaimowitz (1999) & Barbier et al (1995	Various countries in Asia and Africa	Agricultural expansion is caused by an increase in credit availability, lower input prices and technological progress contribute to deforestation

LITERATURE REVIEW

Researchers	Country	Evidence Analysis
Lopez and Galinato (2004)	Brazil, Indonesia, Malaysia and Philippines	Identified structural relationships such as increase road access and other infrastructure and agricultural expansion having negative effects on forest while poverty -reducing programs having a positive influence on forests.
Murali & Hedge (1997)	Asia, South America and North and Central America (141 countries)	Positive relationship between quantities of export of forest products with countries having higher forest areas and eventual conversion of these areas into development uses.

Methods

First model (ARDL)

The ARDL approach in this analysis involve several steps :

(Pesaran and Pesaran (1997)

Second model (OLS)

Step 1 ***= using simple non- linear regression***

Data analysis

- variables of real GDP, agricultural expansion such as oil palm , total population, and export of timber products
- study examines the annual data of these variables ranging from the year 1960 until 2010.
- All of these variables are obtained from the Department of Forestry in Peninsular Malaysia , Ministry Palm Oil Board (MPOB) and also Department of Statistics, Malaysia.

ESTIMATED FIRST MODEL

$$\Delta \ln FA_t = \beta_0 + \beta_1 \mathit{lnFA}_{t-1} + \beta_2 \mathit{lnGDP}_{t-1} + \beta_3 \mathit{lnPOP}_{t-1} + \beta_4 \mathit{lnOP}_{t-1} + \beta_5 \mathit{lnTP}_{t-1} + \sum_{i=0}^{p} \alpha 6\, \Delta\, \mathit{lnFA}_{t-i} + \sum_{i=0}^{p} \theta 7\, \Delta\, \mathit{lnGDP}_{t-i} + \sum_{i=0}^{p} \delta 8\, \Delta\, \mathit{lnPOP}_{t-i} + \sum_{i=0}^{p} \varphi 9 \Delta\, \mathit{lnOP}_{t-i} + \sum_{i=0}^{p} \gamma 10\, \Delta\, \mathit{lnTP}_{t-i} + \varepsilon t$$

Where : -

- *ln FA* = *Log total forest area* (hectares)
- *ln GDP* = *Log real gross domestic product* (RM)
- *ln POP* = *Log population* (000)
- *ln AO* = *Log area oil palm planted following year* (hectares)
- *ln TP* = *Log export of timber product* ('000 m^3)
- E_t = *disturbance Error term*

ESTIMATED SECOND MODEL

$$\text{Def rate}_t = \beta 0 + \beta 1 \ln GDPP_t + \beta 2 \ln GDPP^2{}_t + \varepsilon_t$$

Where : -

Def rate = Annual rate in forest cover loss

- GDPP = GDP per capita (RM)
- GDPP ^{2} = Square Per capita GDP (RM)

Result & Analysis

ARDL Estimation of Deforestation for Peninsular Malaysia

Variables	Coefficients	Standard Error	t-statistics	P- value
LNFA (-1)	0.55503	0.11998	4.6259	0.000
LNGDP	-0.044651	0.016714	-4.6259	-0.011
LNPOP	-1.8886	0.99272	-1.9025	-0.064
LNPOP (-1)	2.0202	0.98573	2.0495	0.047
LNOP	-0.027590	0.012173	-2.2665	- 0.029
LNTP	-0.0063054	0.0028167	-2.2386	0.031
INTP	6.7406	2.0210	3.3352	0.002

Diagnostic test

Diagnostic Tests :		
	R-Squared	= 0.99378
	R-bar squared	= 0.99287
	Serial Correlation	= 0.018278 (0.892)
	Normality	= 0.89418 (0.639)
	Heteroscedasticity	= 1.9397 (0.164)

The result indicates that the long run model has passed all the diagnostic test successfully. This indicates that no serial correlation, the residual term is normally distributes and there is no exist of White Heteroscedasticity.

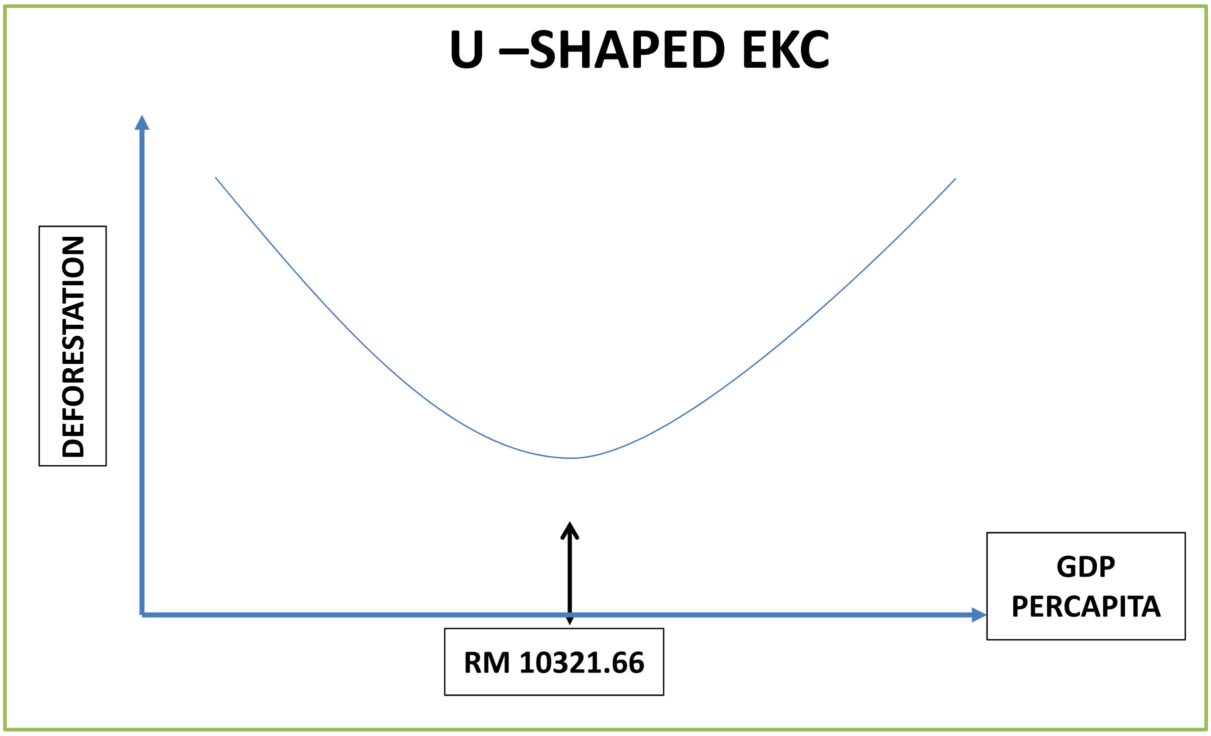
Culas (2006), 2012	Studied the impact of specific institutional factors on the EKC relationship for deforestation Latin American & African countries show significant evidence of an EKC relationship for deforestation and also relevance of the institutional factors to reduce the rate of deforestation. Asia provides existence of a U-shaped EKC

Result & Analysis (Model 2)

$$\text{Def Rate}_t = \beta 0 + \beta 1 \ln \text{GDPP}_t + \beta 2 \ln \text{GDP}^2_t + \varepsilon_t$$

Variables	Coefficients	Standard Error	t-statistic	P-value
lnGDPP	-1.83	0.94	-1.95	0.05
lnGDPP²	0.099	0.05	2.00	0.05
C	8.39	4.38	1.91	0.06

Second model



THE END

THANK YOU FOR YOUR ATTENTION