

## Fallow length a weak indicator of yields in shifting cultivation

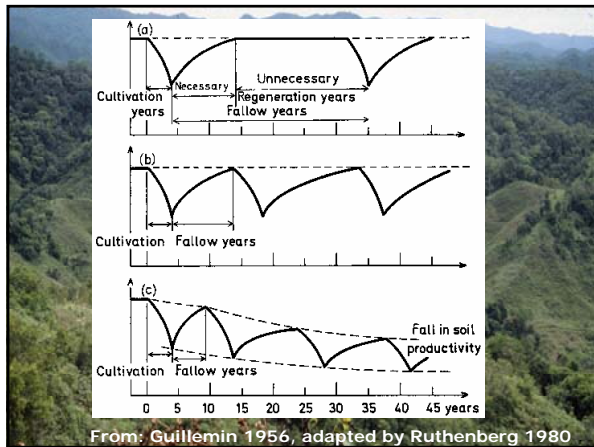
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## The Fallow-Yield Relationship

- causing conventional and destructive perceptions of shifting cultivation

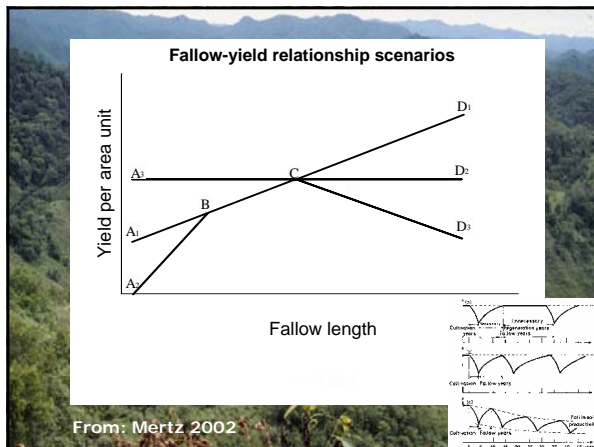
- When fallow periods are reduced, yields and labour productivity will decline
- Population growth induces shorter fallow and will therefore lead to the breakdown of shifting cultivation
- Consequently, it is considered better to abandon shifting cultivation



## Yield Decline with Reduced Fallow?

- Some classical studies often referred to in works on shifting cultivation:
 

• Izikowitz 1951 (Laos):	No
• Freeman 1955 (Borneo):	No
• Conklin 1957 (Philippines):	No
• Nye and Greenland 1960 (Africa):	No
• Miracle 1967 (Congo):	No
• Kunstader 1978 (Thailand):	Yes, but no data
- Empirical evidence:
  - + Studies in India early 1980s
  - + One study in Brazil (Silva-Forsberg & Fearnside)
  - + Study in Laos (Roder) including many fields found no correlation







## Methodology, Sarawak

About 30 Households, 2000-2003 seasons

- Field size measurement with GPS
- Yields of rice and other crops (counting bags, weighing)
- Interviews and diaries to determine:
  - Fallow length and field history
  - Labour input
  - Agrochemical input
  - Pest and disease attacks
- Soil samples from selected fields taken along catena
- Biomass samples from adjacent plots

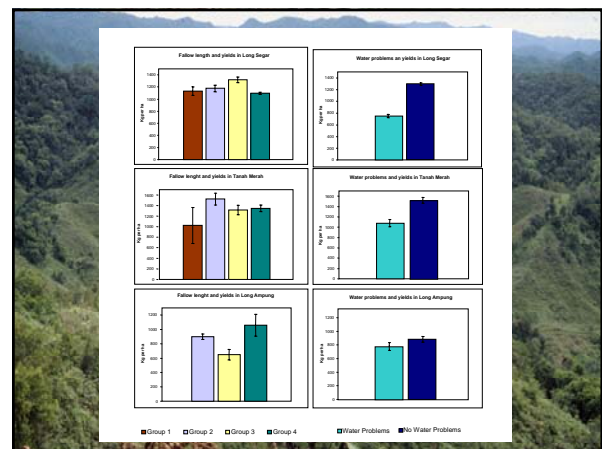
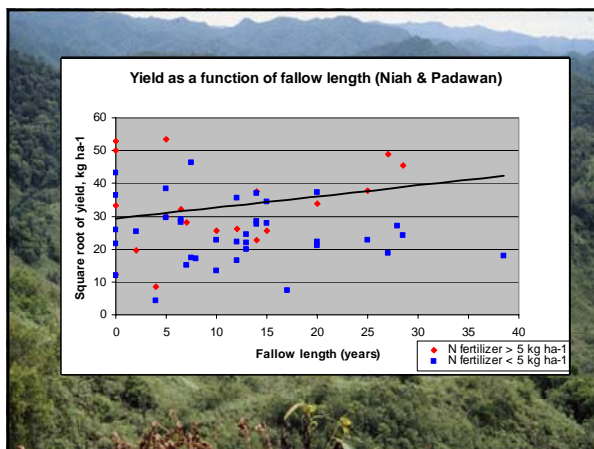
Other studies: Farm and off-farm income, economic risk assessment, long term planning capacity analysis, focus group interviews on past strategies and expectations for the future

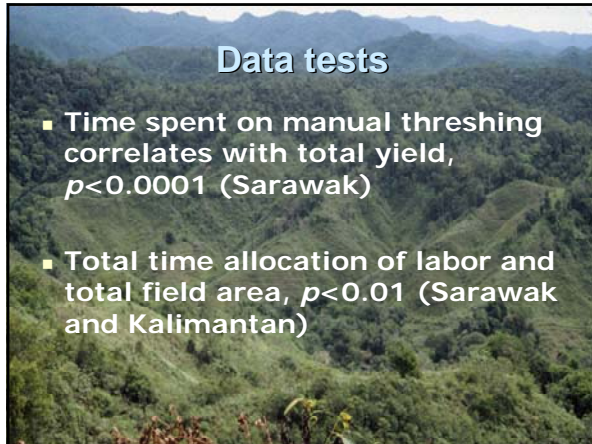
## Methodology, Kalimantan

- West Kalimantan**
  - One location, field research in 1992-1994
  - Land use histories from 1979-1994
- East Kalimantan**
  - Three locations, field research 1979-1980 and 1990
  - Land use histories from 1962-1990
- Data on:**
  - Household composition
  - Forest stage farmed
  - Fallow length (only West Kalimantan)
  - Amount of rice seed planted
  - Amount of rice harvested
  - Cultivation problems encountered
  - Field areas were measured by tape

## Yields and fallow periods

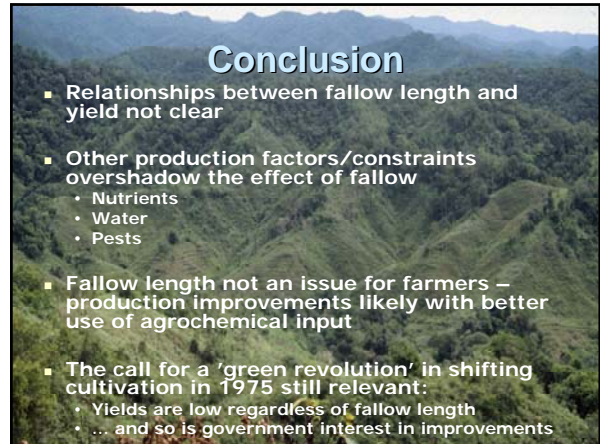
Community, No. obs. (No. seasons)	Mean fallow length, years (Range)	Mean rice yield, kg ha <sup>-1</sup> (Range)
Rumah Muyang, n=41 (3)	12.8 (0-40)	1185 (18-2330)
Rumah Ulat, n=52 (3)	10.3 (0-48)	1023 (54-2857)
Kampung Assom, n=12 (1)	13.7 (7-20)	721 (224-1384)
Kampung Parang, n=12 (1)	12.2 (7-17)	555 (142-1328)
Sungai Sedik, n=160 (15)	20.0 (3-70)	273 (0-1135)
Long Ampung, n=176 (17)	Fallow categorized	845 (0-3300)
Long Segar, n=1762 (27)	Fallow categorized	987 (0-4400)
Tanah Merah, n=228 (8)	Fallow categorized	1359 (0-4400)





### Data tests

- Time spent on manual threshing correlates with total yield,  $p < 0.0001$  (Sarawak)
- Total time allocation of labor and total field area,  $p < 0.01$  (Sarawak and Kalimantan)



### Conclusion

- Relationships between fallow length and yield not clear
- Other production factors/constraints overshadow the effect of fallow
  - Nutrients
  - Water
  - Pests
- Fallow length not an issue for farmers – production improvements likely with better use of agrochemical input
- The call for a 'green revolution' in shifting cultivation in 1975 still relevant:
  - Yields are low regardless of fallow length
  - ... and so is government interest in improvements



### Thanks to:

- Support and assistance
  - Sarawak Government
  - MUCED-SLUSE
  - East and West Kalimantan Provincial governments
  - Forest Department, Indonesia
- Funding
  - DUCED-SLUSE
  - The Foundation of HRH The Crown Prince Frederik of Denmark
  - National Science Foundation
  - Wenner-Gren Foundation
  - UN's Man and Biosphere Program
  - US Forest Service
  - East-West Center, Hawaii
  - FAO's Forests and People Program
- The people of all the communities