



## LECTURE I

# DETERIORATING NATURAL RESOURCES BASE QUALITY AND ITS IMPLICATION TO SUSTAINABLE FOOD SECURITY

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# I WOULD LIKE TO SHARE

- SOME FACTS WE OBSERVE
- PHILOSOPHICAL ORIENTATION
- KIND OF KNOWLEDGE
- HOW WE DEAL WITH NATURAL RESOURCES QUALITY DETERIORATION
- PREDICTING OUR FUTURE
- CLOSING LECTURE

# FACTS WE OBSERVE: Deforestation



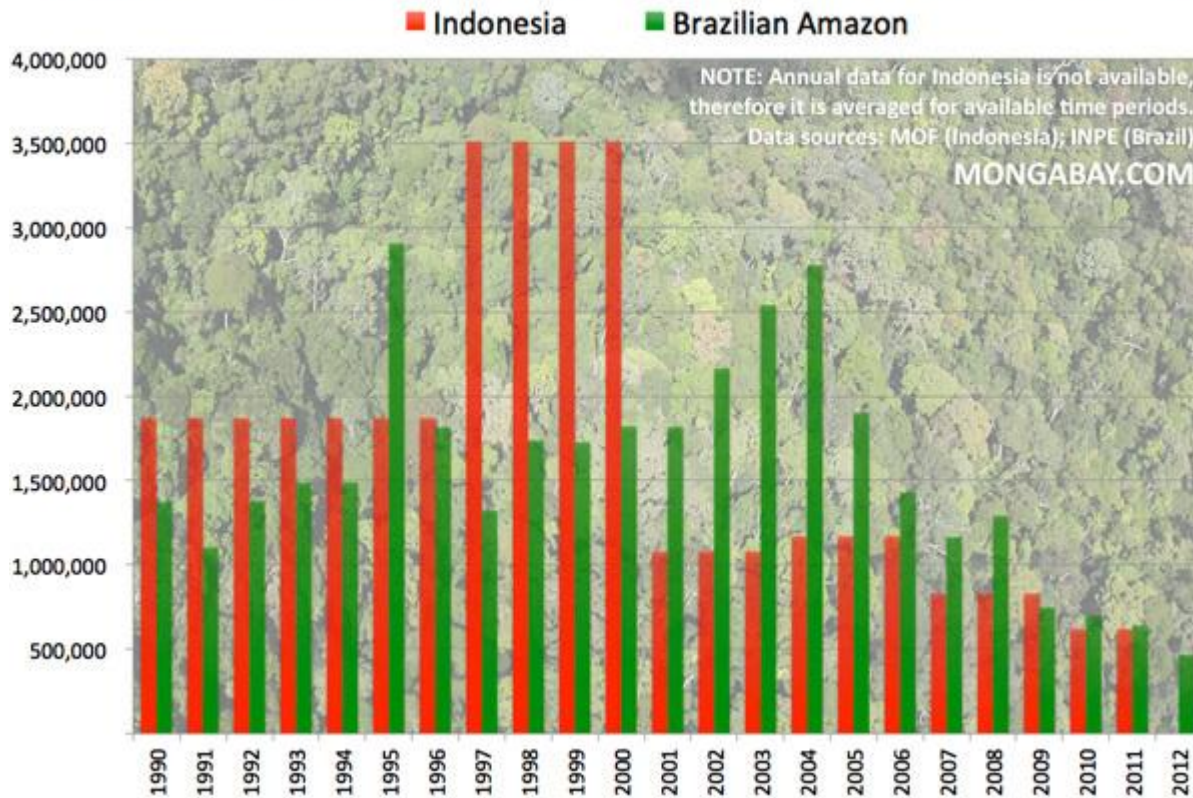


# FACTS WE OBSERVE: Forest fires



# FACTS WE OBSERVE: annual deforestation

Annual deforestation in Indonesia and the Brazilian Amazon, 1990-2011/2012



<http://news.mongabay.com/2014/0109-aceh-tripa-court-decision.html>



# FACTS WE OBSERVE: Soil erosion



DEAD SOIL RESOURCES DUE TO WATER EROSION IN JAVA

# FACTS WE OBSERVE: Mining Upper Watershed



# ON-SITE AND OFF-SITE IMPACTS OF SOIL EROSION IN JAVA 1989

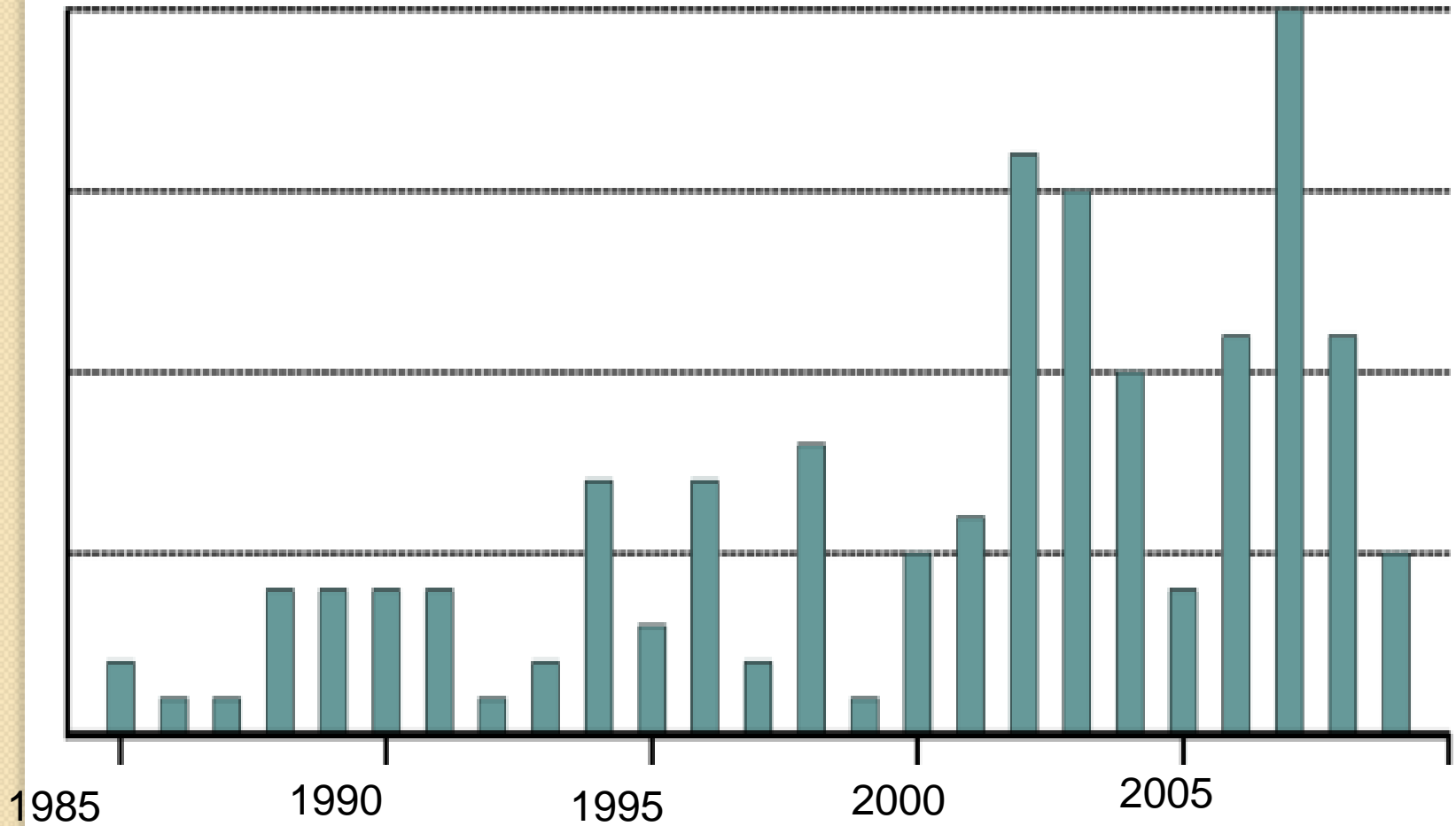
<sup>1)</sup> Includes cost due to siltation of irrigation canals, reservoirs and harbors

*Source: Magrath and Arens, 1989.*

Province	Total area (km <sup>2</sup> )	Average Annual Soil Loss of Agric. Land (T/ha)	Weighted average annual productivity loss (%)	Capitalized value of productivity loss	Of-site cost <sup>1)</sup>
				(million US\$)	
West Java	47,370	144.3	4.4	142	
Central Java	33,013	133.3	4.1	29	
Yogyakarta	3,346	118.2	3.7	6	
East Java	45,308	76.0	3.8	139	
Total On-site	129,037	123.2		315	
Total Off-site					26-91
<b>Total</b>				<b>341-406</b>	



## FREQUENCY OF FLOODS IN INDONESIA



*Data: Dartmouth Flood Observatory: Global active archive of large flood events*

Fahmi Hidayat, 2009

## FACTS WE OBSERVE: River pollution



[http://peakwater.org/wp-content/uploads/2011/09/deadfish\\_small.jpg](http://peakwater.org/wp-content/uploads/2011/09/deadfish_small.jpg)

# FACTS WE OBSERVE: River Pollution



<http://www.citarum.org/node/1130>



# FACTS WE OBSERVE: Corral Reef Deterioration



<http://www.worldrevolution.org/projects/globalissuesoverview/overview2/environmentnew.htm>

# CAN FACTS TELL US BY ITSELF?: PHILOSOPHICAL OR METHODOLOGICAL ORIENTATIONS

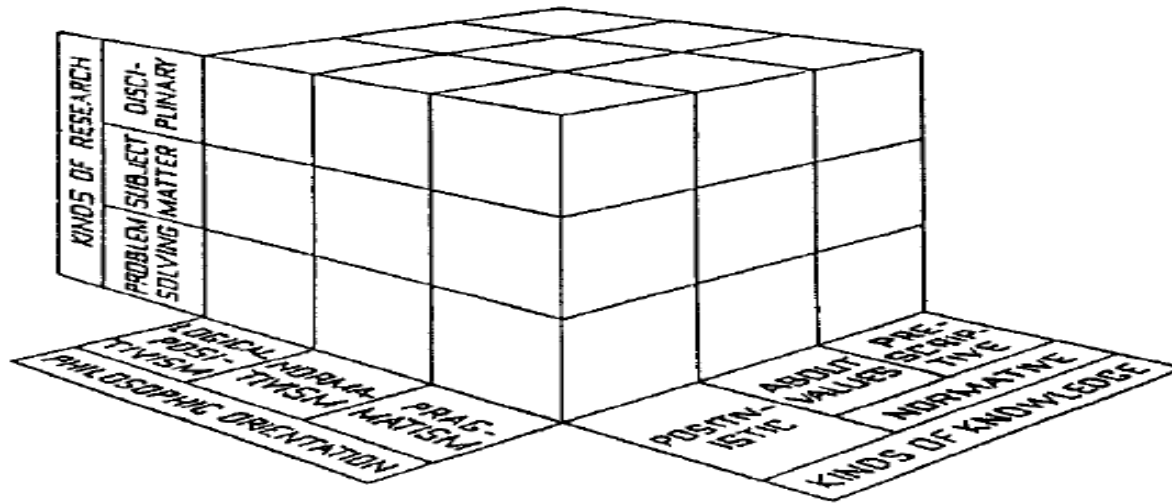
- NO. KNOWLEDGE DEPENDS ON PHILOSOPHICAL ORIENTATION ONES HOLD
  - POSITIVISM
  - NORMATIVISM
  - PRAGMATISM
- HOW WE FORMULATE A PROBLEM?
  - DISCIPLINARY PROBLEM ORIENTATION
  - SUBJECT MATTER PROBLEM ORIENTATION
  - REAL PROBLEM GIVEN DECISION MAKER

# KIND OF KNOWLEDGE

- DISCIPLINARY KIND OF KNOWLEDGE
- SUBJECT MATTER KIND OF KNOWLEDGE
- PRESCRIPTIVE KIND OF KNOWLEDGE



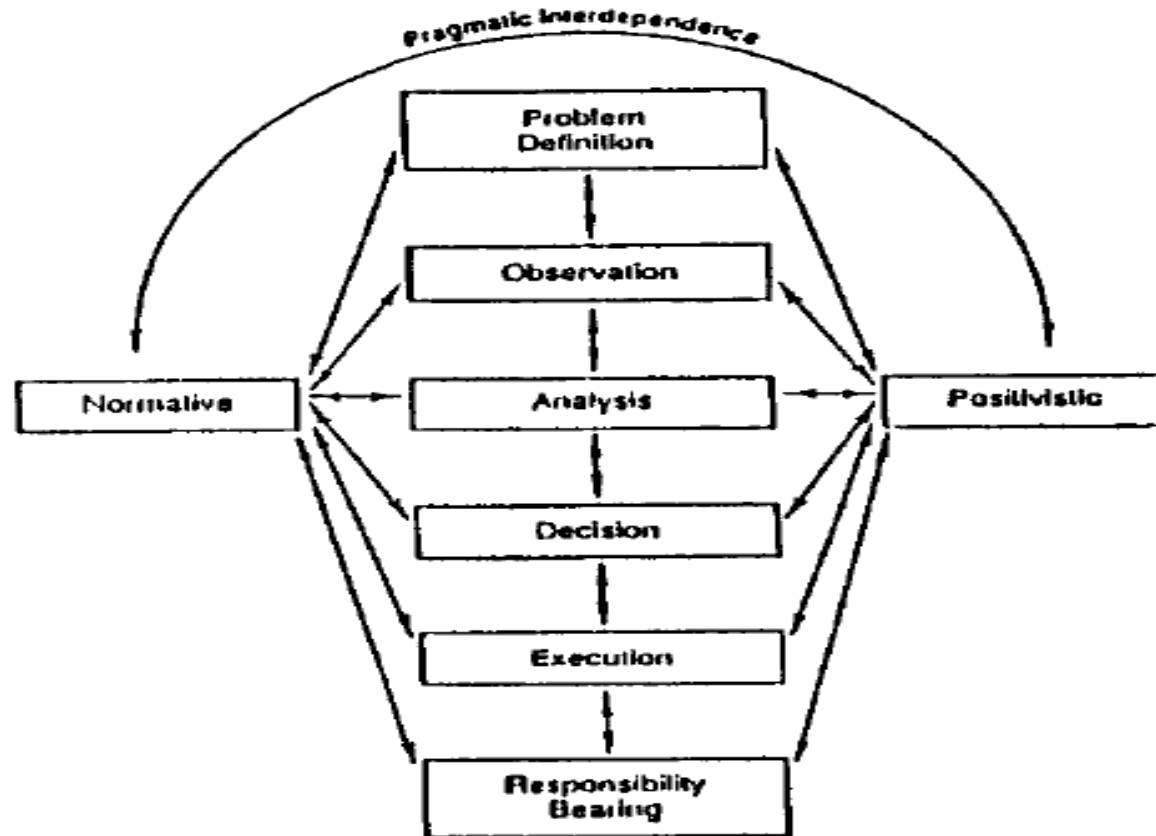
# PHILOSOPHICAL ORIENTATION, TYPES OF RESEARCH AND KIND OF KNOWLEDGE



**Figure 2. Interrelationships among kinds of research done, philosophies used, and kinds of knowledge generated by economic researchers. [1, p. vii]**

**(Source: Johnson, p. vii)**

# PROBLEM SOLVING RESEARCH TO SEEK PRESCRIPTIVE KNOWLEDGE



# HOW WE DEAL WITH NATURAL RESOURCES QUALITY DETERIORATION?

- SOME THEORIES EXPLAINING WHY
  - TRAGEDY OF THE COMMONS
  - LACK OF DEVELOPMENT
  - TOO MUCH DEVELOPMENT
  - TRANSACTION COSTS
  - LEGACY OF COLONIALISM—DUALISTIC THEORY
  - AGNOTOLOGY: PRODUCING IGNORANCE
  - OTHERS



# FROM WHY TO REAL ACTIONS

- WORLD'S EVOLUTIONARY ACTIONS
  - ENVIRONMENTAL MOVEMENT
  - CLUB OF ROME
  - AGENDA 21
  - MILLENIUM GOALS
  - INTERNATIONAL COOPERATIONS
    - MULTILATERAL
    - BILATERAL
    - OTHERS
- INDONESIAN EXPERIENCE
  - REFORESTATION
  - AFORESTATION
  - SOIL AND WATER CONSERVATION
  - BIODIVERSITY CONSERVATION
  - MARINE BIODIVERSITY CONSERVATION
  - FORESTS RESOURCES CONSERVATION
  - ETC.

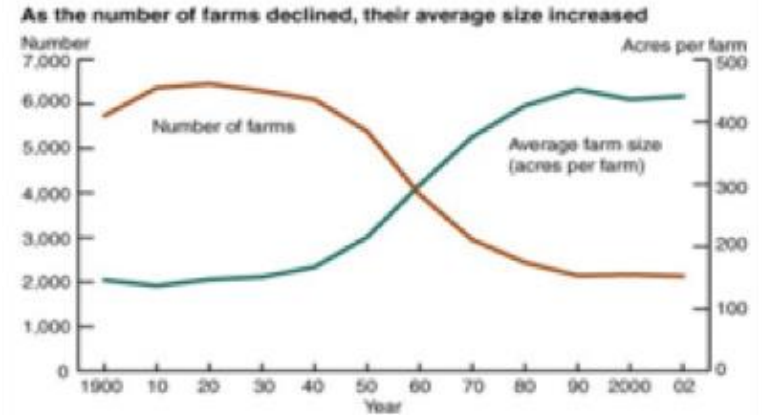
# PREDICTING OUR FUTURE

- GLOBAL CLIMATE CHANGE
- POPULATION GROWTH AND IMBALANCE DISTRIBUTION
- ASSIMILATIVE CAPACITY AND PRODUCTIVE CAPACITY
- TECHNOLOGY IS NECESSARY BUT NOT SUFFICIENT
  - NEW VALUES
  - NEW POLICIES
  - HUMAN RESOURCES
  - INSTITUTION
  - ORGANIZATION
  - INFRASTRUCTURE

# CLOSING



INDONESIA AND OTHER  
DEVELOPING COUNTRIES



Source: Compiled by Economic Research Service, USDA, using data from Census of Agriculture, Census of Population, and Census of the United States.

USA AND OTHER DEVELOPED  
COUNTRIES