

# The Role of Infrastructure and Technology in Advancing Human Development

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Liz Weech<sup>1</sup>, Michael Chene<sup>2</sup>, Cedar Ren<sup>3</sup>, Eric Osinski<sup>4</sup> & Michael Giovanniello<sup>5</sup>  
<sup>1</sup>) eaweech@email.wm.edu, <sup>2</sup>) machene@email.wm.edu, <sup>3</sup>) xren@email.wm.edu  
<sup>4</sup>) emosinski@email.wm.edu, <sup>5</sup>) magiovanniello@email.wm.edu



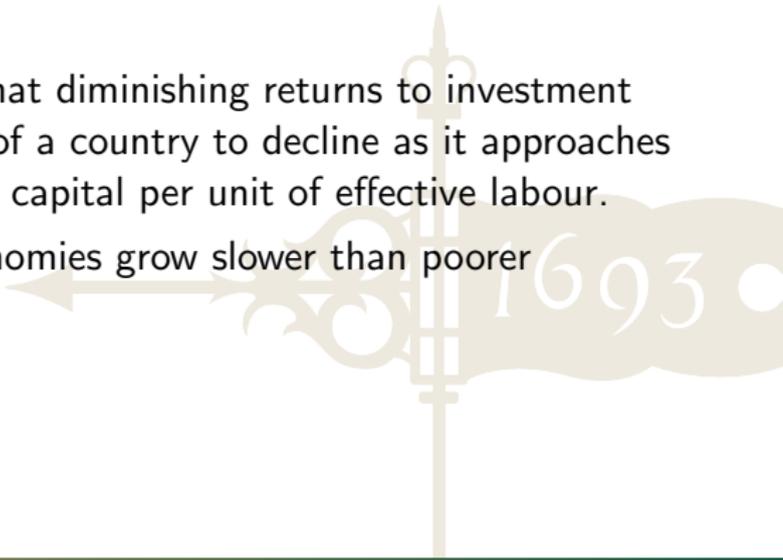
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# Technology and Classical Convergence

Liz Weech

## Classical Convergence:

- ▶ an empirical specification based on the Solow-Swan model of economic growth
  - ▶ Central hypothesis is that diminishing returns to investment cause the growth rate of a country to decline as it approaches its steady state level of capital per unit of effective labour.
  - ▶ implies that richer economies grow slower than poorer economies
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# Appropriate Technology vs Recent Technology

Liz Weech

## ▶ **Appropriate Technology**

- ▶ technology that best utilizes the resource developing countries have in abundance, labor, and minimize dependence on the resource they have little of, capital

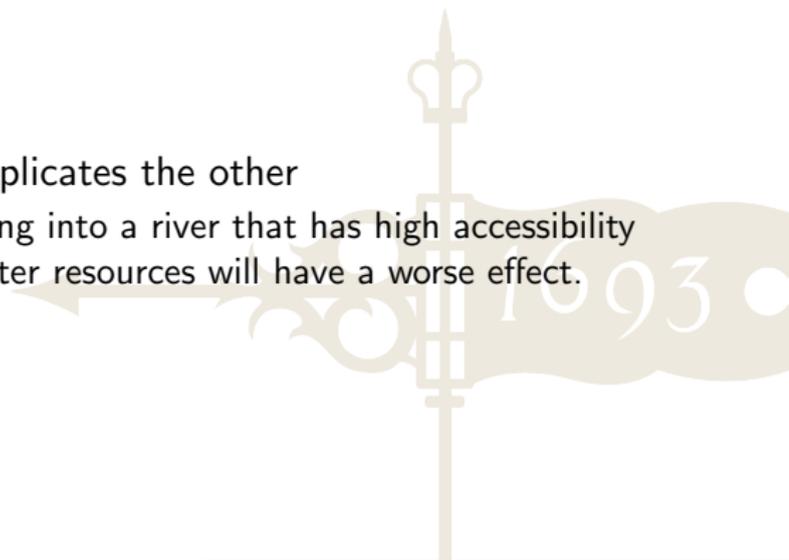
## ▶ **Recent Technology**

- ▶ Maintaining reliance on appropriate technology means developing nations will never catch up to the countries that use cutting edge technology to produce goods faster, cheaper, and, in most cases, of better quality

# Water

Michale Chene

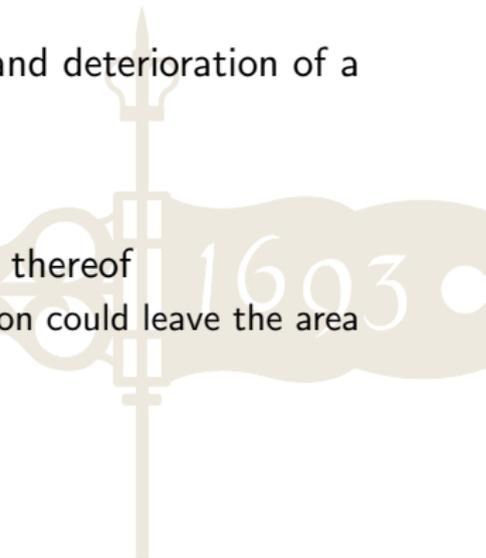
- ▶ Water Problem has three sub-problems
  - ▶ Water Scarcity
  - ▶ Water Degradation
  - ▶ Water Accessibility
- ▶ Each sub-problem complicates the other
  - ▶ Ex. A factor polluting into a river that has high accessibility relative to other water resources will have a worse effect.



# Sub-Problems

Michale Chene

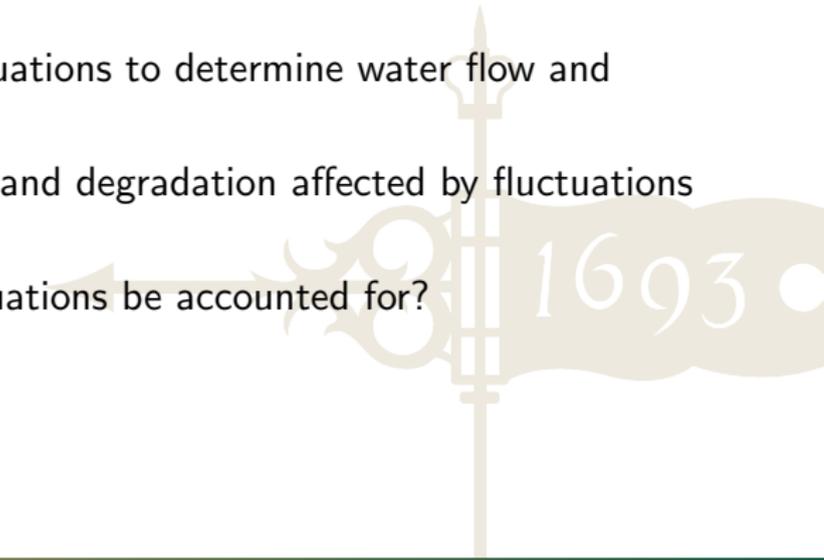
- ▶ Water Accessibility - Distance from and ease to get water.
  - ▶ Ex. People are considered to have water access if a sources is within 100 meters.
- ▶ Water Degradation - Level of pollution and deterioration of a water resource.
  - ▶ Point Source Pollution
  - ▶ Nonpoint Source Pollution
- ▶ Water Scarcity - Supply of water or lack thereof
  - ▶ Amount of water relative to a population could leave the area water scarce.



# Blue Nile River Research

Michale Chene

- ▶ Research on Blue Nile to determine supply of water throughout seasons.
- ▶ Used St. Venant Equations to determine water flow and supply
- ▶ How is water access and degradation affected by fluctuations of supply?
- ▶ How can these fluctuations be accounted for?

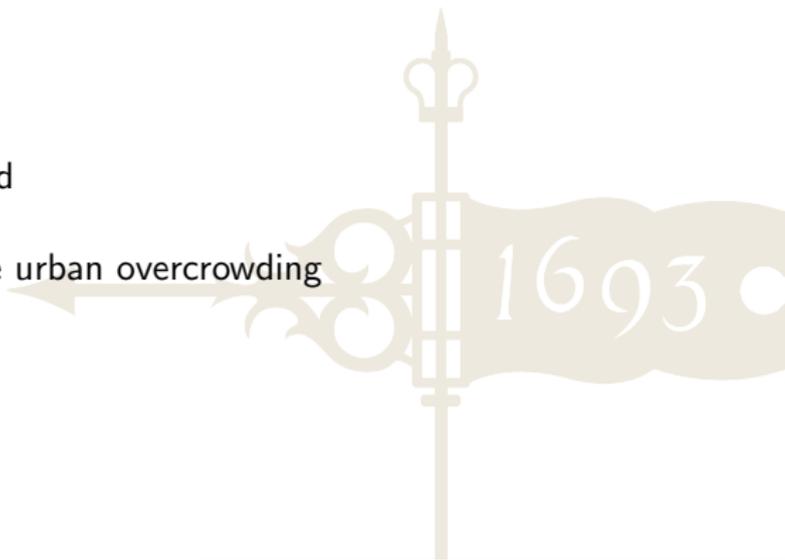


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# Better Irrigation in Developing Countries

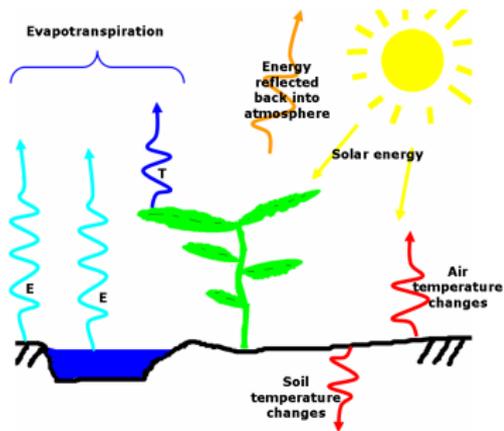
Cedar Ren

- ▶ Agriculture Under Stress
  - ▶ Climate
  - ▶ Population
- ▶ Water
  - ▶ More value produced
  - ▶ Decrease risk
  - ▶ Improve life to solve urban overcrowding



# Energy Balance Models

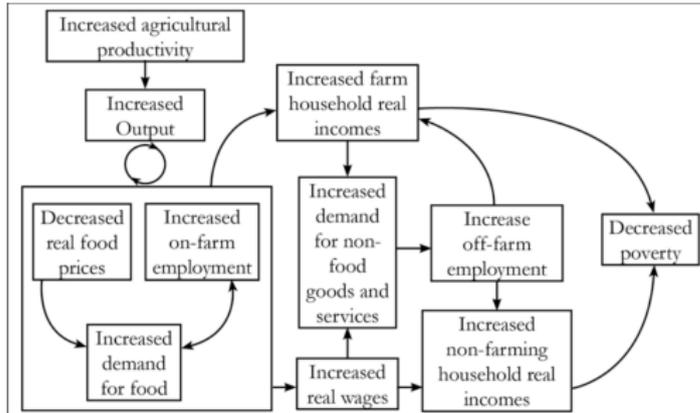
Cedar Ren



- ▶ One principle, lots of variants
- ▶ Applications
  - ▶ Water rights: allocated to max efficiency
  - ▶ Find good land to farm
  - ▶ Predict yields and prepare markets
  - ▶ Garlic: price shock
- ▶ Problems
  - ▶ Bureaucracy
  - ▶ Requires expertise

# Agriculture in the Economy

Eric Osinski



- ▶ Two views of agriculture's role on the economy
- ▶ Agriculture is an important aspect of economic development
- ▶ Improved agricultural productivity in developing countries will benefit both the rural and urban poor

# Agriculture and the Environment

Eric Osinski

- ▶ Modern commercial agriculture has many associated damages to environmental systems
- ▶ Deforestation, Climate Change, over-irrigation, pollutants, soil degradation, and waste
- ▶ Green Revolution in China greatly sparked economic growth but left swathes of land as environmental wastelands
- ▶ Similar economic development must occur but in an environmentally friendly way
- ▶ Sustainable agricultural practices can achieve the same productivity while avoiding associated environmental impacts

# Agricultural Policy in Malaysia

Eric Osinski

- ▶ Linear regression model focussing on the probability of adoption of 6 different sustainable agricultural practices on Malaysian vegetable farms
- ▶ Socio-economic, agro-ecological, institutional, informational, and psychological factors as well as perceived attributes

Sustainable agricultural practices	Ranking				
	1	2	3	4	5
Conservation tillage	Geographical locations	Number of full-time laborers	Chinese	Financial capital	Relative advantage
Intercropping	Geographical locations	Usefulness of information	Male	Duration of land used for farming	
Cover crops/mulches	Geographical locations	Years of formal education	Lowlands	Habit	Keep livestock on farm
Crop rotation	Financial capital	Number of full-time laborers	Flat land	Relative advantage	Geographical locations
Organic fertilizers/composts	Financial capital	Geographical locations	Participation in an institutional arrangement	Organizational membership	Relative advantage
Integrated pest management	Geographical locations	Lowlands	Chinese	Intention	Usefulness of information

# Community Renewable Energy in China

Michael Giovannello

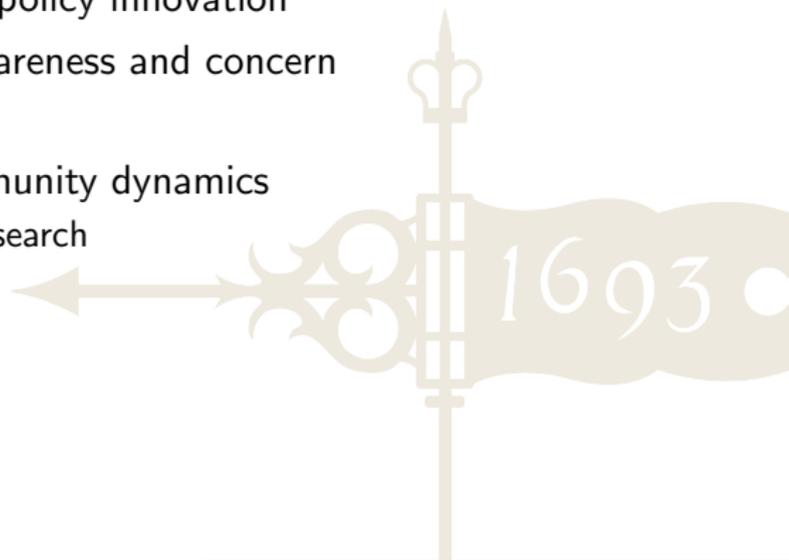
- ▶ China has impressive utility and commercial renewable energy
- ▶ Emphasis on central policy, little regional policy innovation
- ▶ Other Western countries have seen success in community renewable energy



# Why hasn't community renewable energy caught on in China?

Michael Giovannello

- ▶ Lack of local/regional policy innovation
- ▶ Less environmental awareness and concern
- ▶ Middle-class is newer
- ▶ Different/weaker community dynamics
  - ▶ Topic for further research



# Technology and Infrastructure Exchange

Michael Giovanniello

- ▶ China can learn from other countries? successes and vice-versa
- ▶ As countries develop potential for technology use does too
- ▶ Our research highlights the importance of exchanges
- ▶ Infrastructure and technology exchanges can lead to cleaner, quicker development

