Research Process

RSM 321 (Lecture 2)

Md. Abdus Sattar (*abdus.sattar@pstu.ac.bd*)
Lecturer
Department of Resilience and Engineering
Faculty of Disaster Management, PSTU

Jennifer Barrett (WUR)

Faculty of Disaster Management

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Lecture Outline

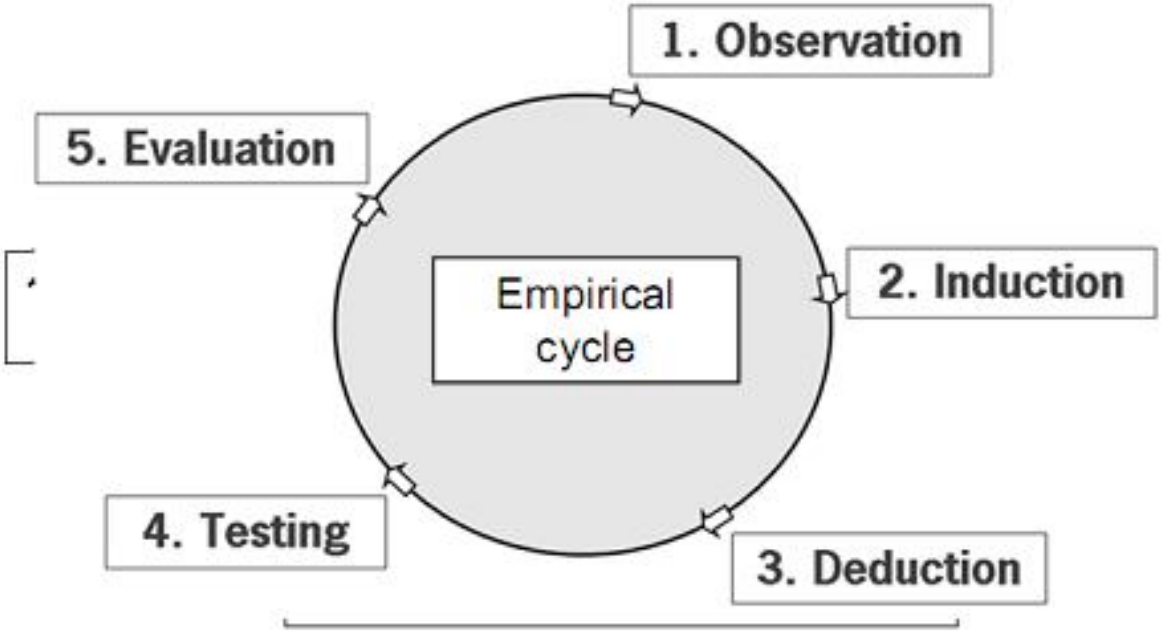
- Empirical and regulative cycle of research
- How can we know what there is to know (ontology and epistemology)

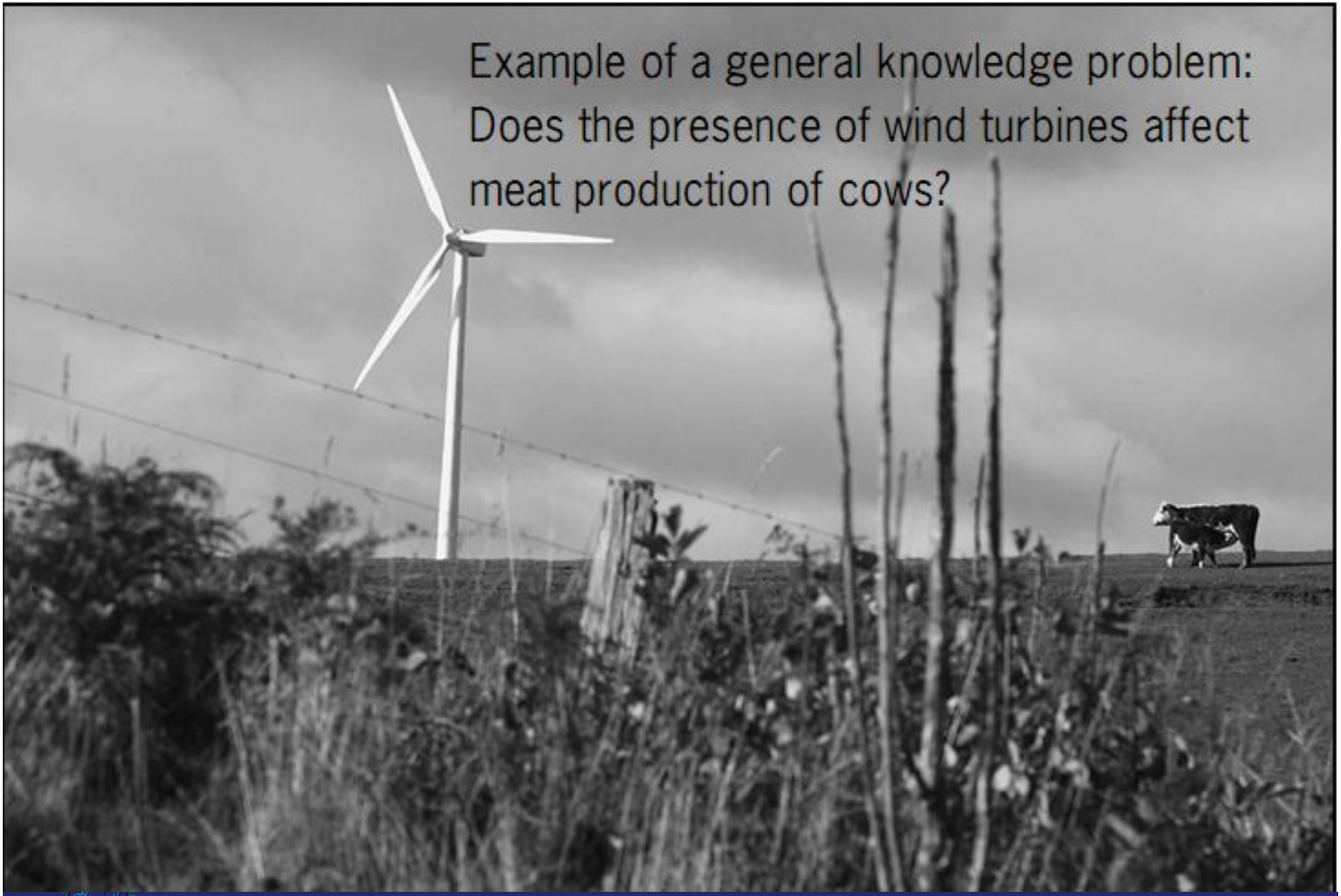
Theory oriented/fundamental research

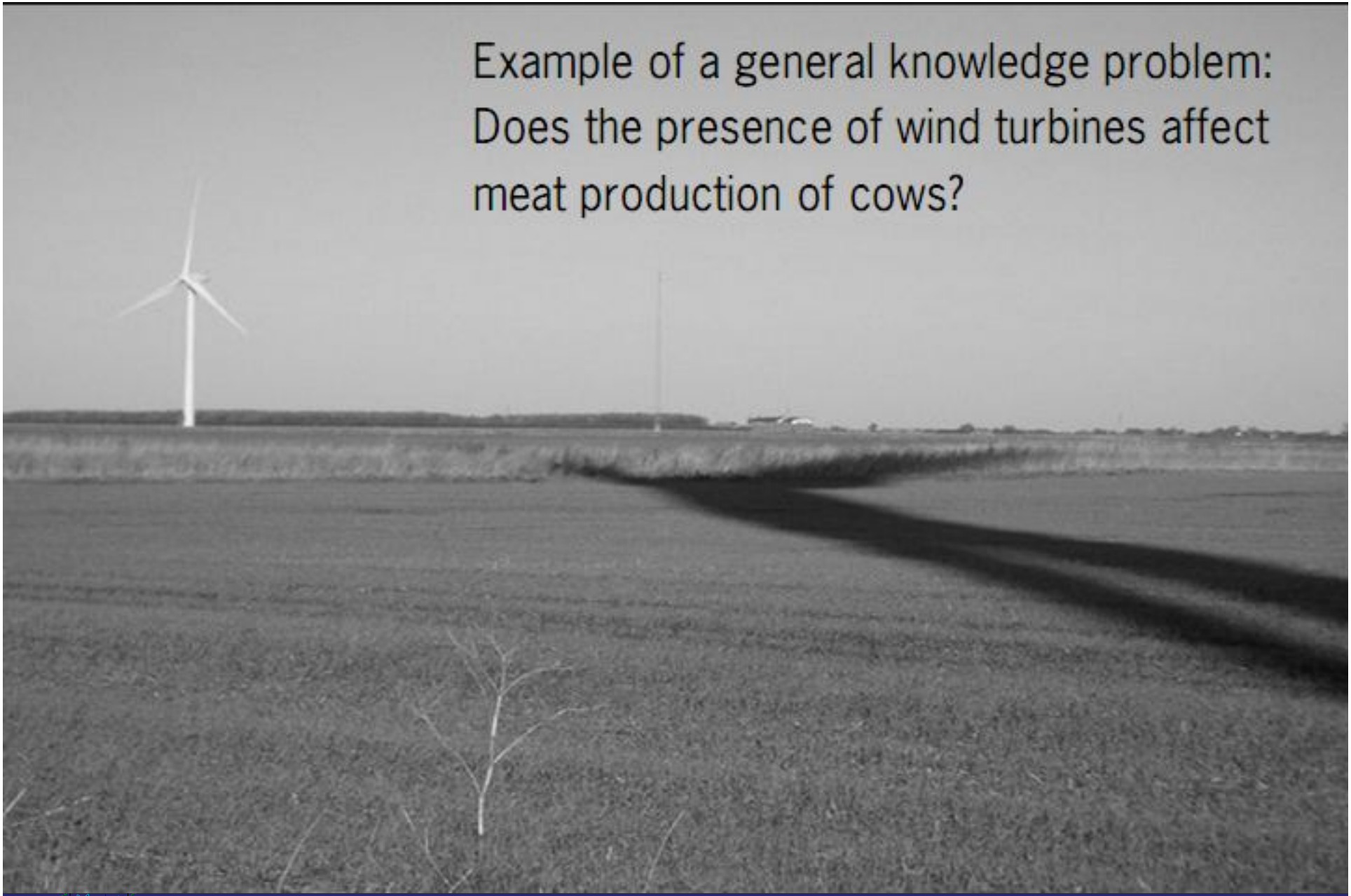
Goal: Generation and verification of theories
Start: Knowledge problem

Phases:

- Theory generation
  - observation
  - induction
- Theory verification
  - deduction
  - testing of rule
  - evaluation




Example of a general knowledge problem:
Does the presence of wind turbines affect
meat production of cows?


Example of a general knowledge problem:
Does the presence of wind turbines affect
meat production of cows?

Example of theory verification

1. Observation:

- Cows grow slower due to the presence of wind turbines.
- Literature review: Anything known about effects of presence of wind turbines on livestock or humans?

2. Induction:

- Hypothesis 1: The cause is the recurring shadows of the wind turbines.
- Hypothesis 2: The cause is the noise of the wind turbines.
- [Alternative: the cause is the combination of the recurring shadows and the noise of the wind turbines.]

Example of theory verification

3. Deduction:

- If hypothesis 1 is true, cows in meadows with recurring shadows of wind turbines are less productive than cows in meadows without these shadows - the noise being equal in both meadows.
- If hypothesis 2 is true, cows in meadows with noise producing wind turbines grow slower than cows in meadows with noiseless wind mobiles.

4. Testing:

- Experimental research, survey of farmers

5. Evaluation of the results

Practice oriented (applied) research

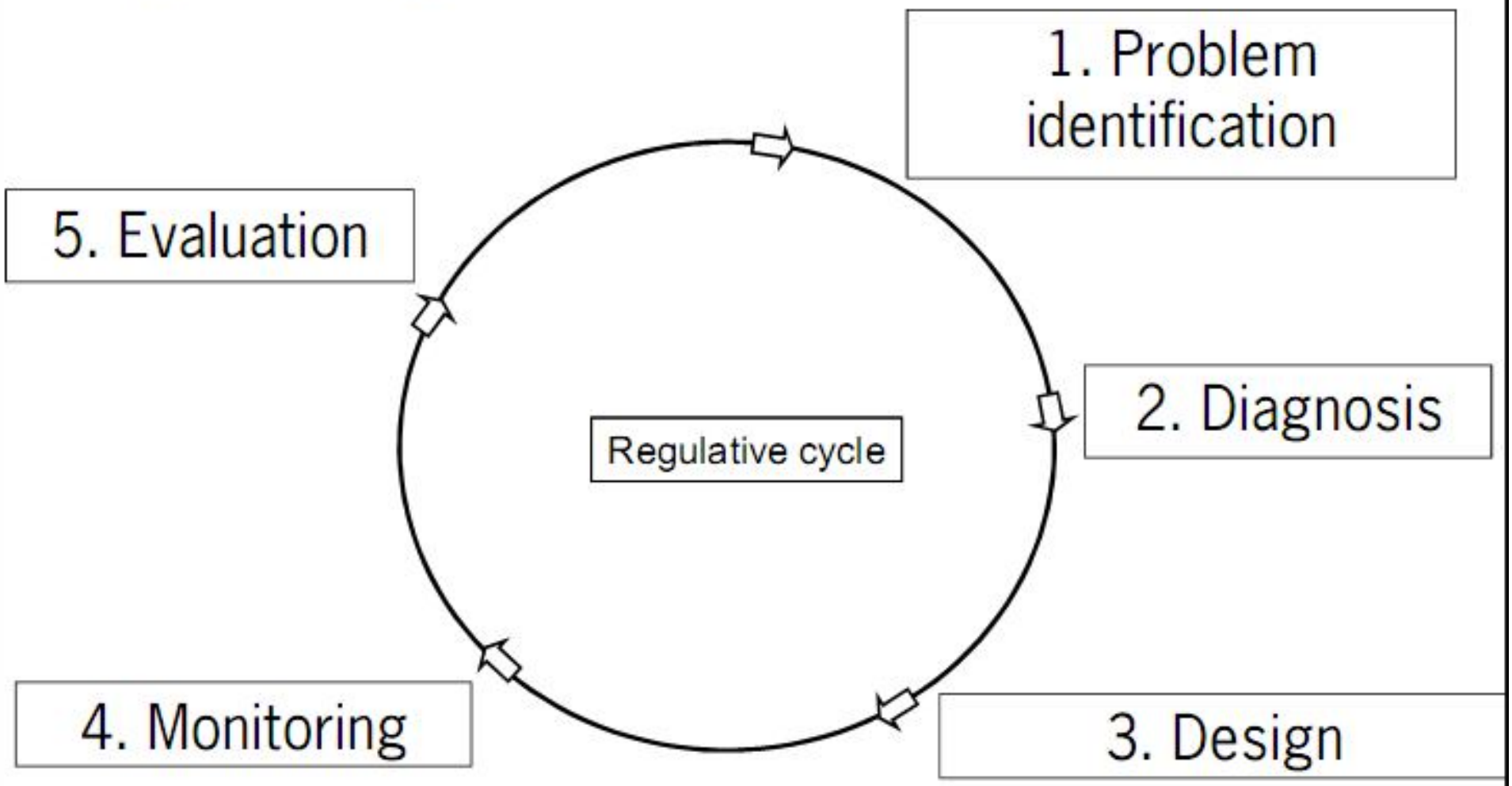
Goal: Developing and trying out solutions

Start: Practical problem

Steps in problem solution

Phases:	*Type of research:*
■ Problem identification	needs assessment
■ Diagnosis	diagnostic research
■ Design	plan selection, optimization, feasibility check
■ Monitoring	implementation check
■ Evaluation	assessment of target fulfillment

Regulative cycle



Regulative cycle

1. Problem finding:

- What is the problem?
  - Profit loss for farmers, because cows grow slower

2. Diagnosis:

- What is the cause?
  - The presence of wind turbines?
  - Recurring shadows, noise, or something else?

Note that in this phase of the regulative cycle, you can use the empirical cycle!

Regulative cycle

3. Design

- Plan selection:

Plan 1. Blindfold the cows
Plan 2. Wind turbines only working during nights

- Optimization (minimize cost, maximize benefit):

Plan 1. Optimal blindfolding materials
Plan 2. Optimal hours for shutting down turbines

- Feasibility check:

Plan 1. Are farmers willing to blindfold their cows
Plan 2. Will electric companies accept the implied losses

Regulative cycle

4. Monitoring

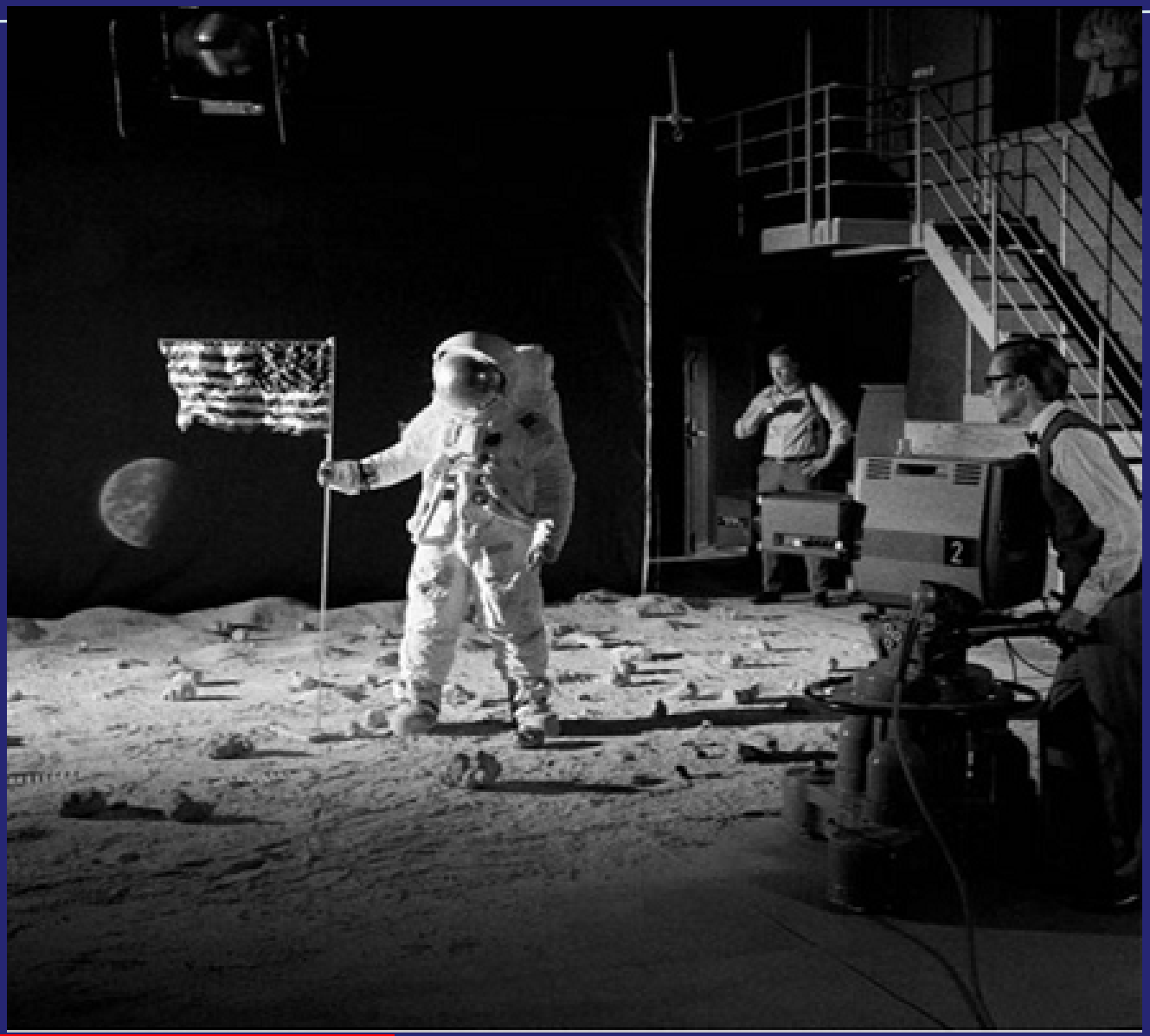
- Are the cows effectively blindfolded?
- Are the wind mills shut off in daylight?

5. Evaluation:

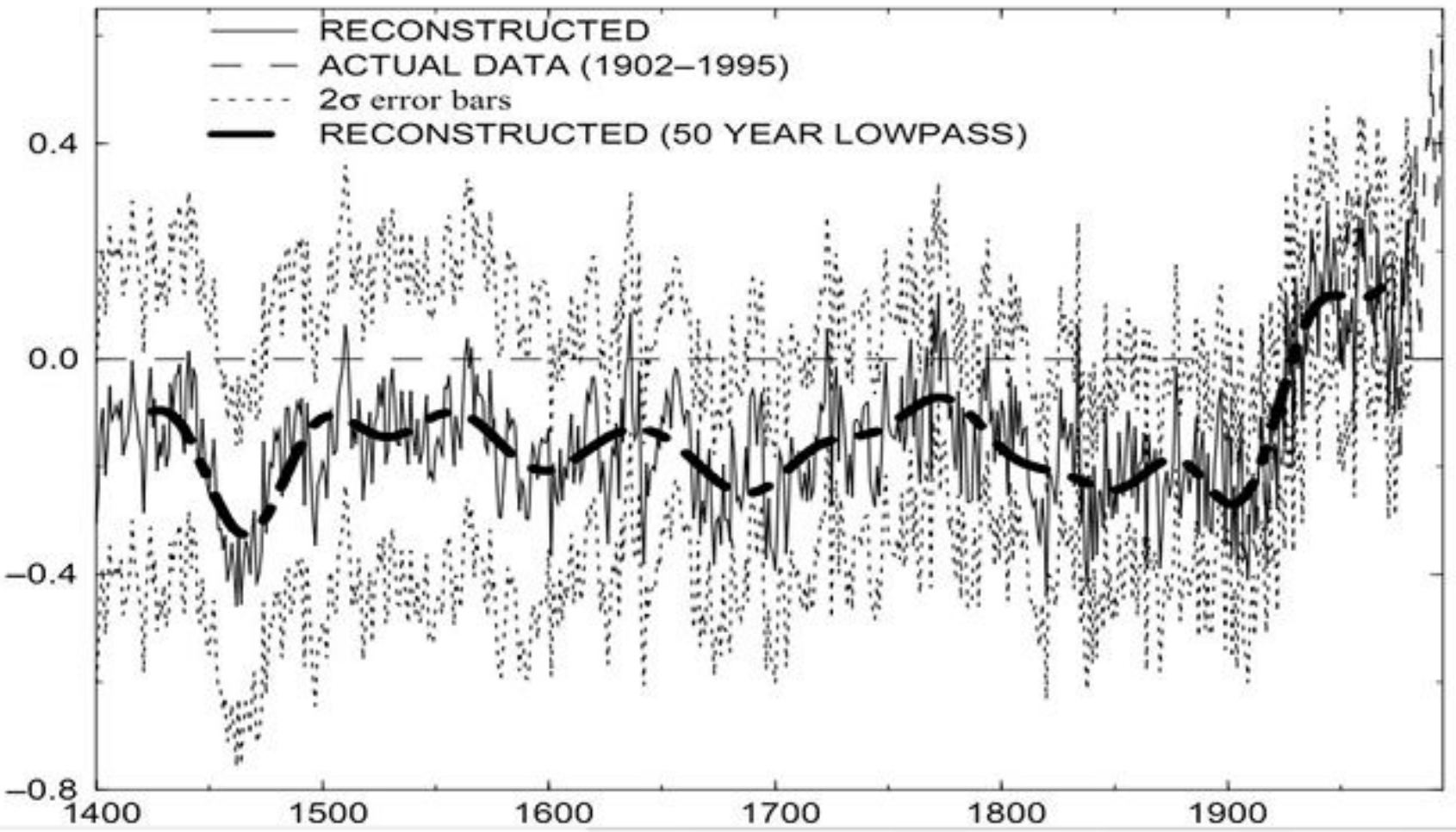
- Are the cows as meaty as they were before?
- Has the profit loss for farmers been tackled?

Why do certain sets of hypotheses gain wide acceptance while others are branded hoaxes?

Moon landing



Global warming



What is reality?

Ontology (what exists?)

- Objectivism (facts have an independent existence)
- Constructionism (facts are constructed and subject to change)

Copernicus

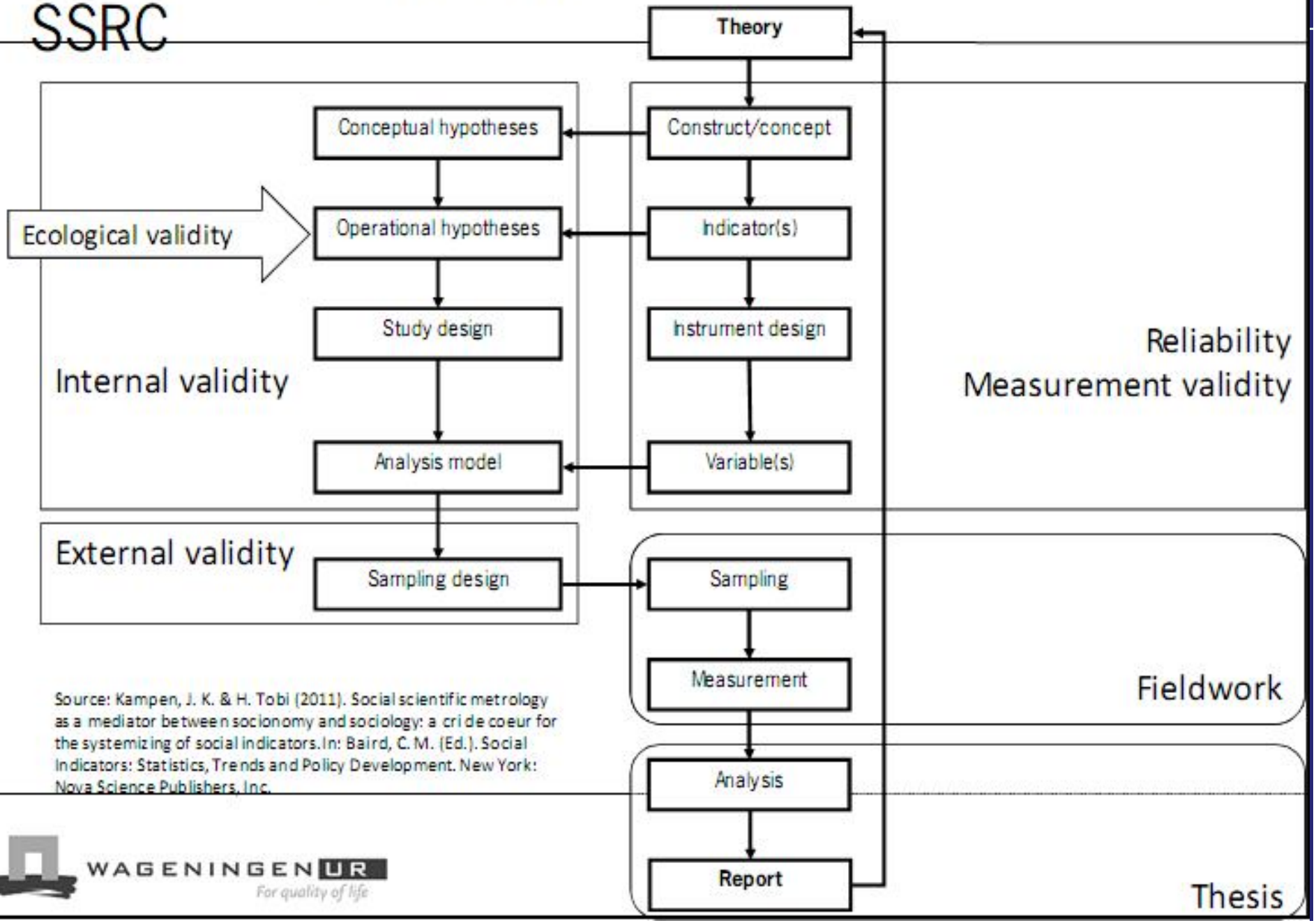
Darwin

Tectonics
(http://www.youtube.com/watch?v=oJfBSc6e7QQ)

Climategate
(http://video.google.com/videoplay?docid=-5576670191369613647#)

Social scientific research cycle

SSRC



Source: Kampen, J. K. & H. Tobi (2011). Social scientific metrology as a mediator between socionomy and sociology: a cri de coeur for the systemizing of social indicators. In: Baird, C. M. (Ed.). Social Indicators: Statistics, Trends and Policy Development. New York: Nova Science Publishers, Inc.

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Thank YOU

Questions??

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