Water-Energy-Food

How have integrationist frameworks altered the discourse and practice of water management?

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WEF mutual interdependence
What’s new in the nexus?

- Resource nexus – crucial for societal well-being and prosperity
- Nexus emerges from water sector, both research and resource policy
  - Allocation & management of scarcity, efficiency
- Social & political processes + institutions & policies – regulate & manage resources
- Security – seen in human, environmental terms and national security terms
Water, energy, food: multi-scale interactions

Water
- Human well-being
- Resilient ecosystems
- Planetary boundaries

Energy

Food

Security
Institutions
Resources
Turning point - The Nexus in 2015

- Shift in global thinking towards sustainable futures
  - Human well-being
  - Resilient ecosystems
  - Co-exist within planetary boundaries
- Paris Climate Accord
- Sustainable Development Goals (SDGs) supplant Millennium Development Goals
Key question

- Does the nexus – the latest in a series of integrationist frameworks – provide better conceptual clarity, operational tools, and human-security outcomes than its predecessors?
Integrationist frameworks

- Integrated water resources management (IWRM)
  - Integrated river basin management (IRBM)
    - Conjunctive surface-groundwater management
    - etc.
- Integrated assessment [modeling] (IAM)
- Coupled natural-human systems (CNH)
- Nexus
  - Energy-food, water-energy, etc.
- Others
Resources, society, institutions

- Nexus links resource-use practices, previously considered in isolation
- Resource efficiency gains
  - Beware, “savings” lead to increased use
  - Jevons’ Paradox (*The Coal Question*, 1865)
  - Rebound (take-back) effect
- Policy articulation is key to operationalizing the nexus
  - Security of resource access
  - Equity – socioeconomic and intergenerational
A word on ‘efficiency’

- ‘Efficiency’ = ‘Savings’ is appealing but can be deceptive
- Efficiency Paradox
  - Capturing single- or cross-resource gains requires limits on use, otherwise efficiency causes depletion
  - Or, Water-utility demand hardening, financial paradox
- ‘Inefficiency’ ≠ ‘waste’
  - Think ‘waste to resource’ across scales, sectors
  - Redundancy enhances resilience
Frameworks: Concepts or tools?

Applications-oriented

Conceptual

Conjunctive
SW-Groundwater

IRBM

Nexus

IAM

IWRM

CNH
Whither the nexus?

- Integrationist tendencies are positive
- Nexus exposes ‘hidden traps’
- Resource linkages must ultimately widen even further, especially for carbon
- Yet, conceptual appeal is accompanied by limits to its application
Ultimate demise of the nexus?

- Broadening of conceptual sweep can diffuse focus
- Solutions-oriented **ambitions** not matched by **outcomes**
- Cross-resource maladaptation a lurking threat
- Nexus institutional integration woefully behind
- *Do ‘all good things come to an end?’*
Conclusions

- Emerging frameworks will expand on integrationist character of the nexus
- Must ultimately confront challenges:
  - social and political equity imperative
  - climate change – negative emissions
  - biodiversity and ecological integrity
  - economic-growth limits of resource use
Spring 2019 Seminar GEOG 596J, Water Management & Policy will focus on: 
**The Water-Energy-Food Nexus**

The nexus of water, energy, and food constitutes the interplay of these three resources across multiple domains: biophysical dynamics, societal dependence, and planetary resilience. Increased understanding of their mutual linkages requires that the nexus extend beyond resources to consider institutions and human security. Nexus thinking emerged in the 1980s, and today influences scholarly work, resource management, and international development investments. Critical reflection on the nexus approach has emerged: what are social-justice, equity, and ecological implications of resource development? This seminar will be based on student-led discussion and will include guest-lecture presentations. Term-paper research on your masters or doctoral topic is encouraged.

For further details, contact Christopher Scott, Professor, Geography & Development; and Director, Udall Center for Studies in Public Policy, [cascott@email.arizona.edu](mailto:cascott@email.arizona.edu).

See past syllabus (to be updated for Jan. 2019):
[https://geography.arizona.edu/sites/geography.arizona.edu/files/u171/Water_Mgmt_+%26_Policy_GEOG_596J_Syllabus_v14Jan2016.pdf](https://geography.arizona.edu/sites/geography.arizona.edu/files/u171/Water_Mgmt_+%26_Policy_GEOG_596J_Syllabus_v14Jan2016.pdf)

**Meets: Wednesdays 1:00 - 3:30PM in ENR2 Building, Room S577**
See complete list of nexus publications:  
http://aquasec.org/wrpg/publications/#nexus
Thanks
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