PROPOSAL DEVELOPMENT

Seminar on Transdisciplinary Approaches to Integrating Policy and Science for Sustainability

Puerto Plata, Dominican Republic, 2016

Proposal Review Criteria

- Topic fits call for proposals (RFP)
- Contribution to science (intellectual merit)
- Broader impacts (solve problems, help society, inform, education, build capacity, etc.)
- Conforms to call for proposals (RFP)
- Well-written and well-integrated, balanced

First Steps:

- Think about your funding agency!

- “The IAI seeks to achieve the best possible international coordination of natural and social scientific, medical and economic research on the extent, causes, and consequences of global change in the Americas, and on response strategies to address those challenges.”

First Steps:

- Read the RFP carefully! (And keep re-reading it)
- FOLLOW the directions!

IAI proposals

- Successful proposals will require ***excellent disciplinary science***, ***interdisciplinary integration*** including both natural and social sciences, ***international collaboration***, a ***clear communication strategy***, and ***capacity building*** to develop the next generation of global change scientists.

Proposal Structure:

1. Executive Summary
2. Background / Rationale / Justification
3. Methodology / Research Design
4. Capacity Building / Broader Impacts
5. Management Plan / Timeline
6. Evaluation / Assessment
7. Budget

Background / Rationale

- Opening section making the overall case for the work (**significance**) and outlining the **knowledge gap**
- Awaken interest in FIRST SENTENCE.
- Quickly get to the point: what are you proposing, and why is it exciting and important?

Example first few sentences:

- During this “Sixth Extinction” Era, native plant and animal species face global threats, as do the humans who directly and indirectly depend on biodiversity. **This proposed PANDiverse network project builds a diverse, international, and transdisciplinary steering committee to share knowledge and best practices to increase resilience to global change threats to biodiversity on smallholder farms across the Americas.**

Example first few sentences:

- During this “Sixth Extinction” Era, native plant and animal species face global threats, as do the humans who directly and indirectly depend on biodiversity. **This proposed PANDiverse network project builds a diverse, international, and transdisciplinary steering committee to share knowledge and best practices to increase resilience to global change threats to biodiversity on smallholder farms across the Americas.**
- **What types of interventions or fixes lead to changes in smallholder farming practices, and how are biodiversity and ecosystem service delivery impacted by these different practices?**

Background / Rationale

- Background: sharpens and fills in the opening to **justify the proposal's specific challenge**
- Provide relevant background info to show what we DON'T know and why it is important (NOT a literature review)
- Approach (quick summary)
- Significance/Impact (reiterate)

What shows Significance?

What shows Significance?

- Timeliness
- Practical solution to a problem
- Fills a major research gap (unique!)
- Implications for a wide range of problems
- Improve quality of life
- Bridge theoretical and practical knowledge
- Sustainable solution to a problem

*** Think about budget and timeline when developing research questions**

What's wrong with this?

- Addressing complex interactions among chemistry, physics, and biology in climate systems requires an interdisciplinary approach. We propose to address this challenge by using Complex Systems Modeling Theory (CSMT). CSMT has been used in chemical systems to model molecular reaction mechanisms and in cell biology to model …

From Schimel 2012

Research Questions & Objectives

- ALWAYS state your question and/or hypothesis
- THEN you can talk about your approach
- “To determine X, we did Y” (“to learn X” is most important part)

Main Questions / Goals Examples:

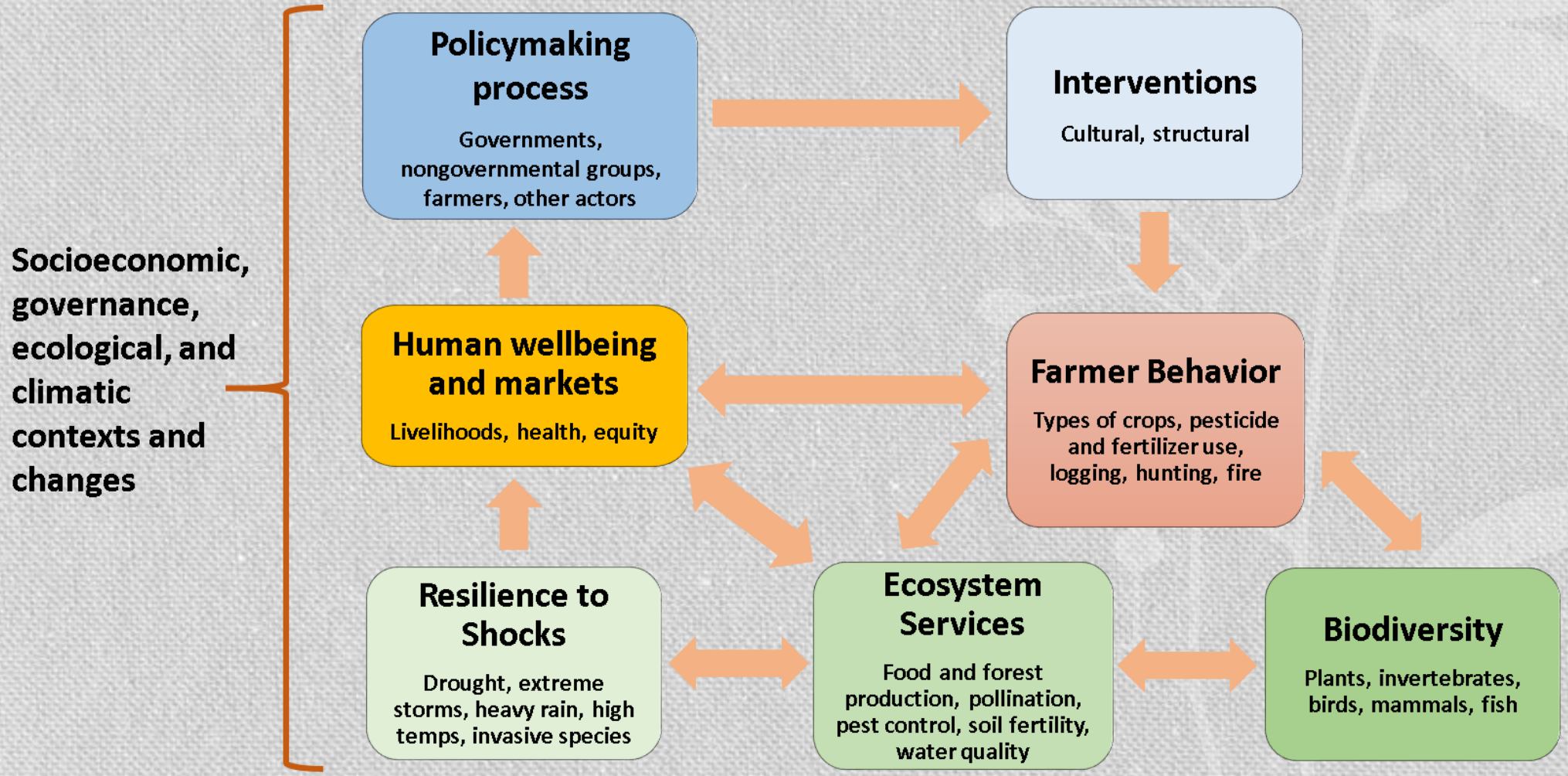
- **Our goals** are to quantify how biofuel production alters: 1) GHG emissions; 2) hydrologic cycling and water quality; and 3) patterns of bird and bee species richness.
- This comparative approach will enable us to: 1) **identify broad patterns** of ecosystem response to land use change associated with biofuel production systems; 2) **assess tradeoffs** between ecosystem services provisioned by alternative land use systems.

Main Questions / Goals Examples:

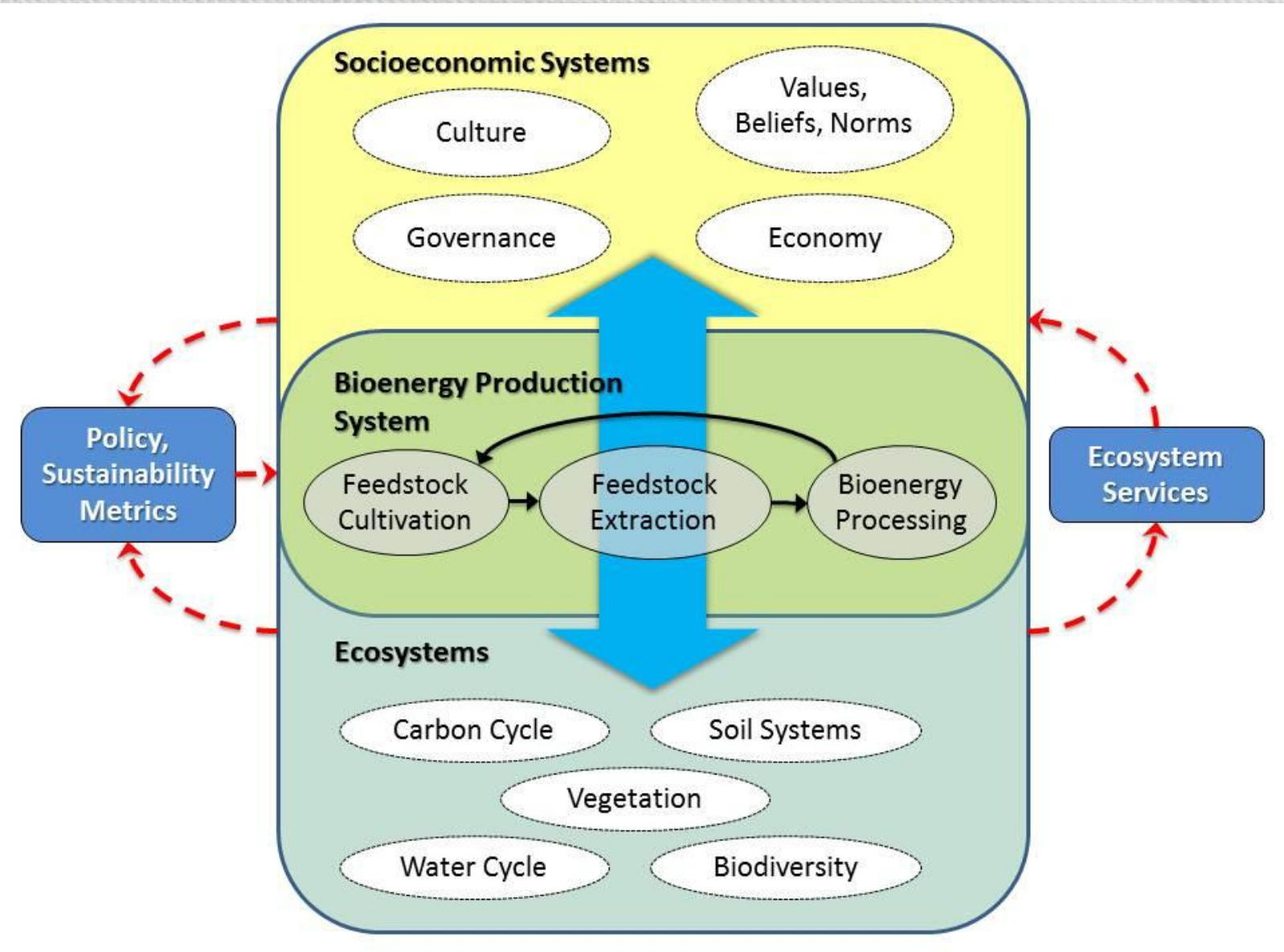
- Biofuel production can modify plant production, GHG emissions, soil biogeochemical cycling, hydrologic cycling, and biodiversity. Changes in any of these processes and systems can greatly alter carbon and water accounting and, therefore, the rationale for sustainable biofuel production.
- **Our goals** are to quantify how biofuel production alters: 1) GHG emissions; 2) hydrologic cycling and water quality; and 3) patterns of bird and bee species richness.

Main Questions / Goals Examples:

Conceptual Figures



Conceptual Figures



Internal Structure

- Make sure the writing is simple, clear, and easy to follow
- All linkages between ideas should be clear (writing should FLOW)
- When introducing a topic, resolve that discussion before introducing a new topic

Research Design and Methods

- Use future tense (i.e., We will XXX)
- Organize according to your specific aims (To determine X, we will Y)
  - Rationale/hypothesis
  - Experimental design (must be clear how it tests your hypotheses/answers questions)
  - Analysis (include INTEGRATION of disciplinary data into final products)

Research Design and Methods

"In order to critically examine the impact of biofuel projects on local adaptive systems, we will use a mixed-method strategy combining surveys, participant observation, qualitative interviews, focus groups, and participatory research incorporating a variety of individuals…"

Broader Impacts

- How will your work benefit society (beyond your research goals)?
- Education (K-12, university)
  - Graduate and undergraduate courses / training / curriculum development
  - Groups underrepresented in STEM especially important (women, minorities)
- Mentoring (students, post-docs)
- Capacity Building (training, equipment installation)
- Outreach (to the public, policymakers)
- Management (problem-solving)
- Policy relevance

Management Plan

- Timeline (when will you do what tasks?)
- How will your team be organized?
- How will your team meet, and how often?

Management Plan Example:

- The research team is structured around subteams and case studies (Table 1). Project Director Halvorsen is responsible for overall project implementation. Each subteam has a leader and the Socioeconomic and Ecosystem Subteams also have separate case study leaders. These leaders will direct and coordinate data collection, analysis, and linkages to the other subteams. The Socioeconomic and Ecosystem subteams will provide results to the Metrics Subteam for modeling and testing metrics with regard to indicators. The Policy Subteam…

Budget

- Should be based on what each member needs to get their part of the project accomplished (i.e., not split evenly)
- Brief justification of all items included
- Examples of items to include:
  - Airplane/bus tickets, salaries for students or technicians, equipment, housing and food, vehicle rental and gas, visas, consultant help, publication costs, translation services

How to make best use of limited space

- It actually helps you! You must be very clear, concise and to the point (and project can't be too ambitious)
- ONLY include background that is DIRECTLY relevant to your questions
- Research question and significance must be easily understood by multiple disciplines
- Hypotheses must be clearly testable within the given timeframe
- Methods and analyses: only the relevant details and understandable to all

Phase One: Letter of Intent (2 pages)

- Must Include:
  - Project title
  - Project duration (up to 24 months)
  - Funding requested (up to US $100,000)
  - Principal Investigator (PI) (name, institution, country)
  - Co-Investigators (co-PI) (names, institutions, countries)
  - Problem to be addressed (e.g. research questions, hypotheses)
  - Project objectives
  - Project activities
  - Expected results (deliverables, outputs)
  - Project team (areas of expertise)
  - Science-Policy interface

How you will be evaluated:

- scientific excellence (intellectual merit)
- transdisciplinarity
- science-policy interface
- clear benefit in the short to mid term
- capacity of the team to carry out the proposed work
- feasibility and usefulness of the project to a “beneficiary/end-user”

Phase Two: Full Proposal (6 pages)

- No more than 6 pages (Literature Cited, Appendix and Budget do not count)
- 12 pt font (Times New Roman), single spaced