STRATEGIES FOR “GETTING TO SCALE”: EXPANDING SUCCESSFUL WATERSHED MANAGEMENT

REBECCA POWER AND AMULYA RAO, UNIVERSITY OF WISCONSIN ENVIRONMENTAL RESOURCES CENTER

MATT HELMERS, IOWA STATE UNIVERSITY
Goals

1. Interim Goal – 20% Reduction in N & P Loading by 2025
2. 45% Reduction in N & P Long-Term Goal

• WE NEED IT ALL!!
  1. N MANAGEMENT
  2. CROPPING PRACTICES/LANDUSE
  3. EDGE-OF-FIELD PRACTICES
<table>
<thead>
<tr>
<th>State</th>
<th>Practice/Scenario</th>
<th>Nitrate-N Reduction</th>
<th>Total Equal Annualized Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td><strong>N management</strong> - Maximum Return to Nitrogen Application Rate and 60% of all Corn-Bean and Continuous Corn Acres with Cover Crop <strong>Edge-of-Field</strong> - 27% of all ag land treated with wetland and 60% of all subsurface drained land with bioreactor</td>
<td>42</td>
<td>756</td>
</tr>
<tr>
<td>Illinois</td>
<td><strong>N management</strong> - Maximum Return to Nitrogen Application Rate, Spring N, 70% cover crop on tile drained land and 45% on non-tiled <strong>Edge-of-Field</strong> - 30% of drained acres treated with wetland, 50% of drained acres treated with bioreactor, all ag streams with buffer</td>
<td>45</td>
<td>728</td>
</tr>
</tbody>
</table>

IA – 4% interest rate, 50 yr planning horizon  IL – 6% interest rate, 20 yr planning horizon
LEVEL OF IMPLEMENTATION NEEDED FOR ONE NITRATE-N REDUCTION SCENARIO IN IOWA AND ILLINOIS

45% Reduction Goal

- Cover Crops
- Wetlands
- Bioreactors

Scenarios Assume MRTN on All Acres
EXAMPLE OF WHAT IT MIGHT TAKE TO REACH INTERIM GOALS?

<table>
<thead>
<tr>
<th>State</th>
<th>Practice/Scenario</th>
<th>Nitrate-N Reduction % (from baseline)</th>
<th>Total Equal Annualized Cost Million $/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td><strong>N management</strong> - Maximum Return to Nitrogen Application Rate and 20% of all Corn-Bean and Continuous Corn Acres with Cover Crop <strong>Edge-of-Field</strong> - 8% of all ag land treated with wetland and 15% of all subsurface drained land with bioreactor</td>
<td>20</td>
<td>221</td>
</tr>
<tr>
<td>Illinois</td>
<td><strong>N management</strong> - Maximum Return to Nitrogen Application Rate, 35% cover crop on tile drained land <strong>Edge-of-Field</strong> - 15% of drained acres treated with wetland, 50% of drained acres treated with bioreactor</td>
<td>20</td>
<td>246</td>
</tr>
</tbody>
</table>
LEVEL OF IMPLEMENTATION NEEDED FOR ONE NITRATE-N REDUCTION SCENARIO IN IOWA AND ILLINOIS

Scenarios Assume MRTN on All Acres
MINNESOTA

Figure 5-6. Nitrogen milestone reductions for Mississippi River Major Basin.
CHALLENGE

• HOW DO WE GET THE LEVEL OF IMPLEMENTATION TO APPRECIABLY MOVE THE NEEDLE ON REDUCING DOWNSTREAM NUTRIENT LOADING?

• HOW DO WE ELIMINATE WATER IMPAIRMENTS, WHILE MAINTAINING OTHER ECOSYSTEM SERVICES?
GETTING TO SCALE
GETTING TO SCALE

• WHAT DO WE KNOW ABOUT GETTING TO SCALE?
• WATER AS A COMMON POOL RESOURCE
• NECESSARY ELEMENTS OF SUCCESSFUL WATERSHED MANAGEMENT MODEL?
WHAT DO WE KNOW ABOUT GETTING TO SCALE?

• WHAT CAN FRANCHISING TEACH US? FRANCHISES . . .
  • LEVERAGE KNOWLEDGE OF 1) SUCCESSFUL SYSTEMS AND 2) SUCCESSFUL ADAPTATION STRATEGIES
  • INCREASE ATTRACTIVENESS TO INVESTORS AND CUSTOMERS
  • SHARE ADMINISTRATIVE RESOURCES, E.G. GRANT-WRITING, TECHNICAL EXPERTISE

Bradach 2003
https://ssir.org/articles/entry/goosing_to_scale
WHAT DO WE KNOW ABOUT GETTING TO SCALE?

• IDENTIFY CONSISTENT ELEMENTS OF OUR THEORY OF CHANGE
• DETERMINE HOW TO REPLICATE THE OPERATING MODEL
  • DESIGN GROWTH STRATEGY
  • DESIGN THE NETWORK
  • DETERMINE THE ROLE OF NETWORK FOUNDERS
    • ENSURING QUALITY
    • FACILITATING LEARNING
    • PROVIDING CENTRAL SERVICES

Bradach 2003
WATER AS A COMMON POOL RESOURCE

Private Good

Club Good

Public Good

Common Pool
SOCIAL CHANGE: PRINCIPLES FOR GOVERNING THE COMMONS

1. DEFINE CLEAR GROUP BOUNDARIES

2. MATCH RULES GOVERNING USE OF COMMON GOODS TO LOCAL NEEDS AND CONDITIONS; RULE COST MATCHES BENEFIT

3. ENSURE THAT THOSE AFFECTED BY THE RULES CAN PARTICIPATE IN MODIFYING THE RULES

4. MAKE SURE THE RULE-MAKING RIGHTS OF COMMUNITY MEMBERS ARE RESPECTED BY OUTSIDE AUTHORITIES

Ostrom 1990 and others
5. Develop a system, carried out by community members, for monitoring members’ behavior

6. Use graduated sanctions for rule violators

7. Provide accessible, low-cost means for dispute resolution

8. Build responsibility for governing the common resource in nested tiers from the lowest level up to the entire interconnected system

Ostrom 1990 and others
RULE STRUCTURES – FORMAL AND INFORMAL*

- LIMITS ON SYSTEM
  - NARRATIVE NUTRIENT CRITERIA
  - NUMERIC NUTRIENT CRITERIA

- LIMITS ON BEHAVIOR
  - PERFORMANCE-BASED LIMITS (E.G. P-INDEX
  - PRACTICE-BASED LIMITS

- INCENTIVES
  - PAY FOR PERFORMANCE
  - PAY FOR PRACTICES
  - SOCIAL PRESSURE AND SUPPORT

- BARRIER REMOVAL
  - SHARED EQUIPMENT
  - SHARED SERVICES

*IT MATTERS WHO MAKES THE RULES, AND AT WHAT SCALE

- GOVERNMENT REGULATION – FEDERAL, STATE, LOCAL
- OTHER SOCIAL REGULATION
- SELF-REGULATION
NECESSARY ELEMENTS OF SUCCESSFUL WATERSHED MANAGEMENT MODEL?

- HUMAN CAPITAL
- SOCIAL CAPITAL
- WATERSHED FINANCING SYSTEMS
- POLICY AND GOVERNANCE SYSTEMS
HUMAN CAPITAL AND WORKFORCE DEVELOPMENT

- **Watershed Leadership (Coordinators, Landowners, Farmers, Farm Advisors, Water Utilities, Sewerage Districts, Citizens)**
- **Professionalizing Watershed Management** (Professional Certification, Support from Professional Organizations, Advantages of Networking, Professional-Level Compensation)
- **Skills and Training**
SOCIAL CAPITAL

- COMMUNITY AND STAKEHOLDER INVOLVEMENT
- SOCIAL NETWORKS
- SOCIAL NORMS
- TRUST
WATERSHED FINANCING SYSTEMS

THE USUAL SUSPECTS
- FEDERAL FUNDING
- STATE GPR
- WATERSHED AND SOIL AND WATER CONSERVATION DISTRICTS
- LANDOWNERS/MANAGERS
- NGOS

FOCUSED INNOVATIVE ARRANGEMENTS
- WATERSHED TRADING AND WATERSHED ADAPTIVE MANAGEMENT
- MARKET-DRIVEN PRIVATE SECTOR INVESTMENTS
- STATE REVOLVING LOAN FUND
- NONTRADITIONAL FEDERAL FUNDING SOURCES – EG. HUD
POLICY AND GOVERNANCE SYSTEMS

• LOCAL GOVERNANCE SYSTEMS
• STATE GOVERNANCE SYSTEMS
• MULTISTATE AND NATIONAL GOVERNANCE SYSTEMS
• CROSS SCALE CONSIDERATIONS
EXAMPLE ELEMENTS OF A THEORY OF CHANGE FOR ADDRESSING N AND P IN THE UPPER MIDWEST

• WATERSHED NUMERIC GOALS FOR N AND P SET AT STATE LEVEL WITH FEDERAL OVERSIGHT, ADAPTED TO LOCAL CONDITIONS
• TIMEFRAME FOR GOALS TO BE REACHED SET AT STATE LEVEL
• STATEWIDE HUC 10 MONITORING
• HUC 10-12 SCALE WATERSHED PROJECTS WITH WATERSHED PLANS
• LOCAL NETWORKS SET LOCAL RULES TO MEET N AND P GOALS
• CONSISTENTLY APPLY GRADUATED SANCTIONS FOR NOT MEETING GOALS
EXAMPLE ELEMENTS OF A THEORY OF CHANGE FOR ADDRESSING N AND P IN THE UPPER MIDWEST

• STATEWIDE NETWORK OF WATERSHED COORDINATORS SUFFICIENT TO SUPPORT HUC 10-12 WATERSHED PROJECTS

• TRAINING SYSTEM FOR WATERSHED COORDINATORS, CITIZENS, FARMERS, FARM ADVISORS

• PROFESSIONAL ORGANIZATION FOR WATERSHED COORDINATORS AND ASSOCIATED LEADERS

• FOUNDATIONAL PUBLIC FUNDING FUNDING FOR HUC 12 WATERSHED PLANNING AND IMPLEMENTATION
QUESTIONS

• DOES IT MAKE SENSE FOR DEVELOP COMMON ELEMENTS OF A SUCCESSFUL OPERATING MODEL FOR ACHIEVING FULL-SCALE WATERSHED MANAGEMENT IN THE UPPER MIDWEST?

• IF SO, WHAT DO YOU THINK ARE THE COMMON ELEMENTS OF A SUCCESSFUL OPERATING MODEL?

• WHAT ARE THE BARRIERS TO DEVELOPING A COMMON MODEL?