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Infographic Slides

2022-2023

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Integrating Crops and Livestock

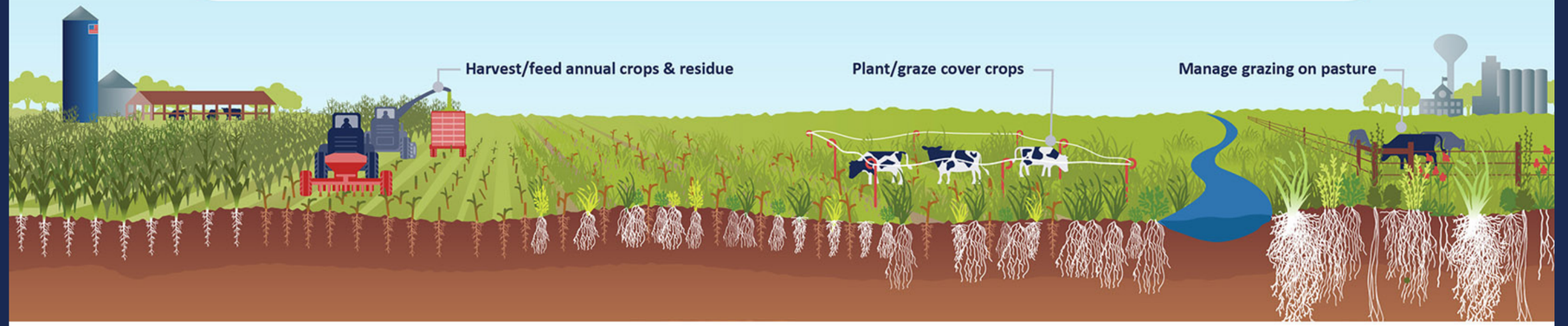
Increased Profit Per Acre

Cost Reduction
- Manure = fertilizer
- Stretch feed supply
- Break pest and weed cycles

Income Benefits
- Marketable cover crop
- Diversify income streams
- Eco credits

Soil Benefits
- Improve fertility
- Enhance water infiltration
- Increase organic matter

Community Benefits
- Support local farms and businesses
- Safeguard local water
- Build relationships
- Opportunities for new farmers



Is it working? *Observe, adjust, expand*

→ **Learn** *Field days, extension*

→ **Start small**

→ **Partner** *www.midwestgrazingexchange.com*

→ **Challenges** *Complexity, costs, fencing, labor, logistics, knowledge, time*

Let's Talk!

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Match Made in Heaven: Livestock + Crops

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Benefits of Investing in Perennial Forage & CLC

Perennial agriculture and living cover are investments with long-term benefits

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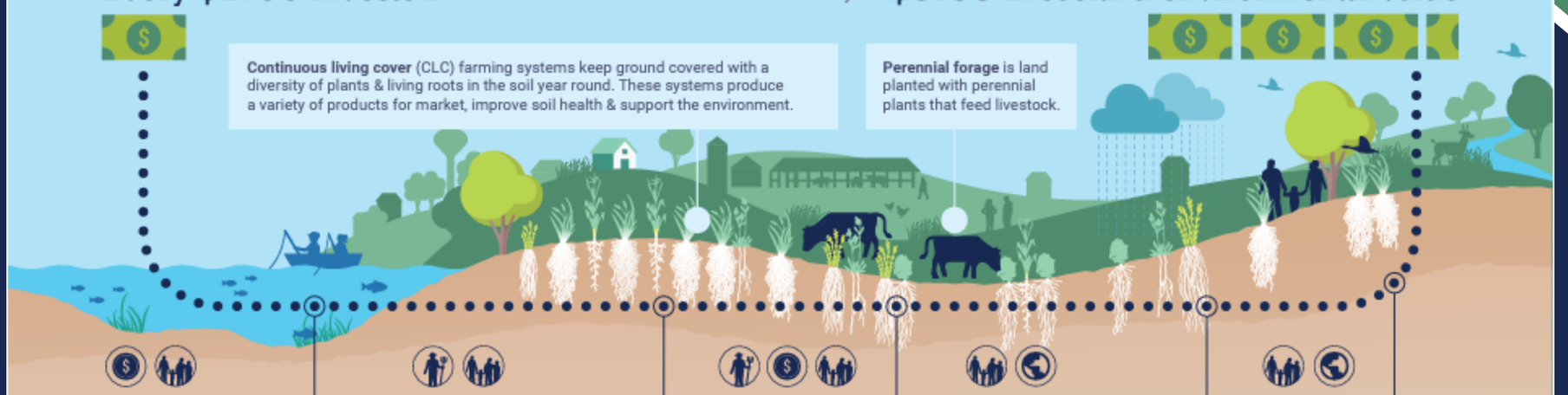
Every **$1.00** invested → PROJECTED SROI* → **$3.38** in social & environmental value

Continuous living cover (CLC) farming systems keep ground covered with a diversity of plants & living roots in the soil year round. These systems produce a variety of products for market, improve soil health & support the environment.

Perennial forage is land planted with perennial plants that feed livestock.



Improved Water Quality

- Reduced health risks
- Reduced costs to water management systems
- Improved aquatic ecosystems

On-Farm Economic Benefits

- Income from grazing & other CLC crops
- Reduced inputs, field repair & labor costs after establishment

Soil Health

- Reduced soil erosion
- Reduced infrastructure costs from sediment pollution

Increased Climate Resilience

- Reduced GHG emissions
- Moderated impacts of flooding or drought

Improved Habitat & Ecology

- Improved & increased habitat for wildlife, pollinators
- Increased land & water recreational opps

Who benefits?

Benefits that accrue on-farm have cascading impacts

- Farmers and Landowners
- Taxpayers
- Local Community
- Society

*Social Return on Investment drawn from an impact analysis calculated by Ecotone Analytics: https://z.umn.edu/GLBW_SROI

How to invest

Contact GLBW@umn.edu to discuss a variety of active opportunities with us and network partners.

- **Support farmer adoption** and costs of establishment, transitioning and expansions
- **Fund supportive resource networks,** including technical support and peer-learning
- **Fund capacity to activate the system levers of markets,** value chain coordination, technical assistance and policy

CLC addresses UN Sustainable Development Goals for reducing hunger, improving health, life on the land & climate.

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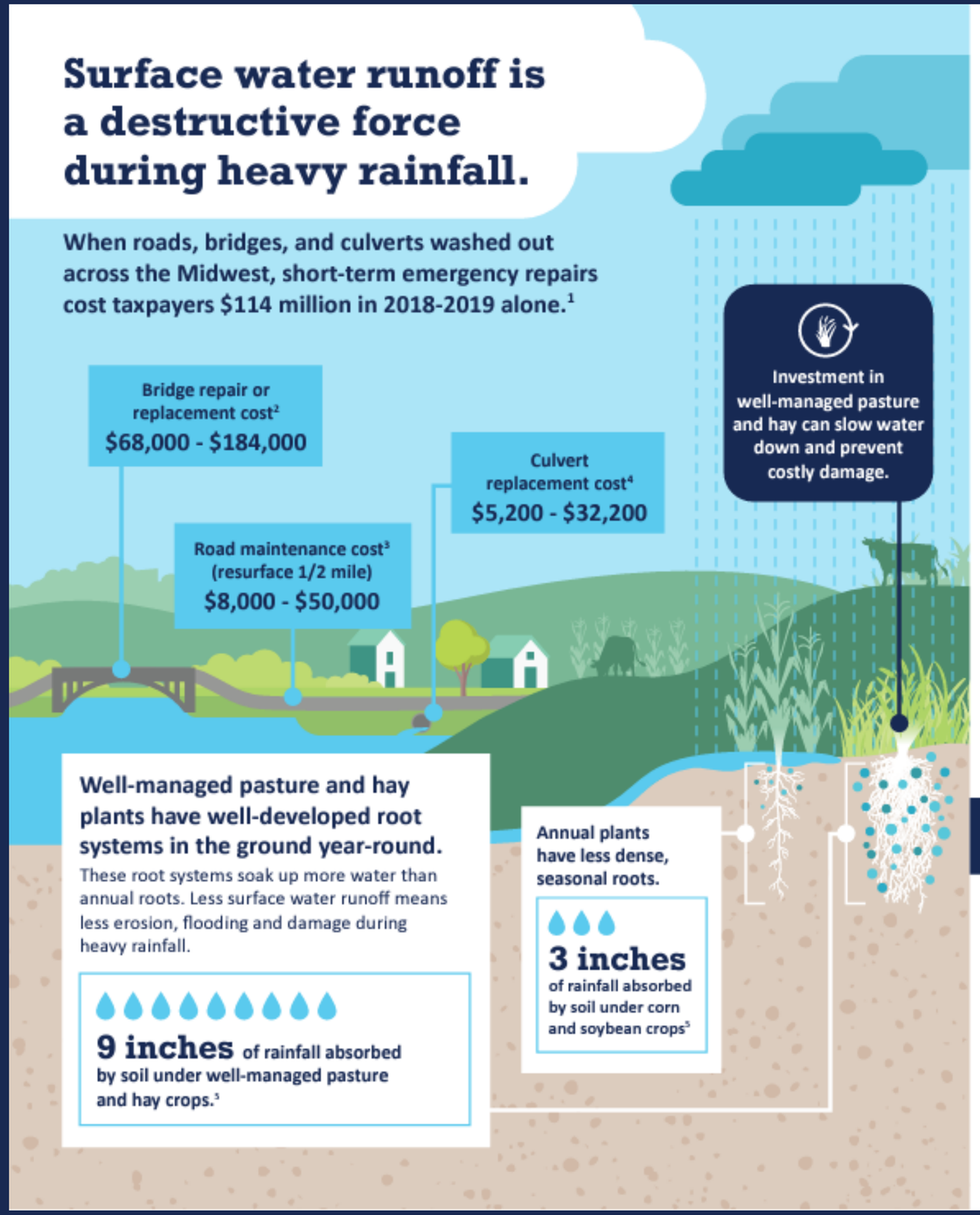
Perennial Forage for Infrastructure Protection

Surface water runoff is a destructive force during heavy rainfall.

When roads, bridges, and culverts washed out across the Midwest, short-term emergency repairs cost taxpayers $114 million in 2018-2019 alone.[1]



Well-managed pasture and hay plants have well-developed root systems in the ground year-round.

These root systems soak up more water than annual roots. Less surface water runoff means less erosion, flooding and damage during heavy rainfall.

9 inches of rainfall absorbed by soil under well-managed pasture and hay crops.[5]

Annual plants have less dense, seasonal roots.

3 inches of rainfall absorbed by soil under corn and soybean crops[5]

Invest in Farmers

Farmers and landowners can create conditions that protect infrastructure.

"As many small dairy farms have gone out of business, the land has lost well-managed forage land. Roads bordered by well-managed crop and pasture land seldom need ditching. Roads bordered by crop land that is poorly managed often need maintenance after every heavy rain event."

JACK HERRICKS
Jefferson Township Chairman, Monroe County, WI

Learn more about how productive, well-managed pasture and hay ground can protect infrastructure.

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Midwest Perennial Forage Working Group

1 FWHA emergency highway repair allocations, 2018-2019. https://www.fhwa.dot.gov/pressroom/fhwa1918.cfm
2 Averages for IL, IA, MN, MO, WI; non-National Highway System bridges; 2017. https://www.fhwa.dot.gov/bridge/nbi/sid2017.cfm
3 Average Annual Cost for Road Maintenance. USDA Forest Service. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd528063.pdf
4 2015 Maintenance Culvert Cost Data Analysis. MN DOT. http://www.dot.state.mn.us/bridge/hydraulics/culvertcost/2015%20Drainage%20Maintenance%20Data%20Summary%20-%20Final%20Version.pdf
5 Averages of measurements in June, August, and October/November. J. L. Bharati, K.-H. Lee, T.M. Isenhart, and R.C. Schultz. 2002. Soil-water infiltration under crops, pasture, and established riparian buffer in Midwestern USA. Agroforestry Systems 56:249-257.

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Five Dimensions
of Impact

Continuous Living Cover (CLC)
FIVE DIMENSIONS OF IMPACT

IMPACT MANAGEMENT PROJECT

WHAT: CLC cropping strategies and the perennialization of the agricultural landscape produce food, feed, fuel and fiber and deliver environmental and socioeconomic benefits, including soil health, biodiversity, climate change resilience, quality of life, and equitable access/support for all farmers.

WHO: Midwest farmers; local, downstream, and regional communities and ecosystems; global climate.

HOW MUCH: Farmer income streams are diversified and stabilized, mitigating weather and market crises. Ecological and socioeconomic benefits accrue on individual farms, across communities, and at a landscape level.

CONTRIBUTION: CLC and perennial cropping strategies offer longer growing seasons, deeper roots, improved soil health and water quality, more resilient ecosystems, and varied market opportunities over annual monocropping production systems.

IMPACT RISK MITIGATION: Farmers can adopt CLC cropping strategies in a variety of ways; various on-ramps offer flexibility and expanded accessibility; a network approach informed by multiple sectors de-risks investment in adoption and supportive infrastructure.

ECOTONE ANALYTICS

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AG TRANSFORMATION INDICATORS

- ↑ Farmer Adoption
- ↑ Soil Health
- ↑ Funding, Policies, Markets
- ↑ Regional Food System Stability
- ↑ Equitable Ag Opportunities

- ↓ Ecosystem Degradation
- ↓ GHG Emissions and Climate-Related Risk
- ↓ Damage to Infrastructure

ECOTONE ANALYTICS

Ag Transformation Indicators

LOGIC MODEL | Network Approach to CLC

Investment Opportunity: CLC adoption incentives for long-term impacts

ECOTONE ANALYTICS

INPUTS	ACTIVITIES	OUTPUTS	SHORT TERM OUTCOMES	INTERMEDIATE OUTCOMES	LONG TERM OUTCOMES	IMPACTS
Green Lands Blue Waters and Network Partners:			↑ Crop diversity and continuous living cover ↑ Livestock integration with cropping systems ↑ Root structure and soil health ↓ Energy consumption ↑ Income diversity ↑ Potential increase in labor ↑ Socioeconomic justice work embedded in agroecological transformation efforts	↓ Soil erosion ↓ Nutrient runoff and input application ↑ Flood resiliency ↑ Carbon sequestration ↑ Wildlife and pollinator habitat ↓ Ecotoxicity ↓ Risk of insurance claims ↑ Potential increased net income ↑ Diversity of leadership and ownership in ag/food sector	↓ Sedimentation ↑ Crop yields and productivity ↑ Air, water, and drinking water quality ↑ Community health ↑ Wildlife and biodiversity ↓ Eutrophication and hypoxia ↓ Global climate risks ↑ Socioeconomic benefits fairly distributed across ag/food supply chain	↑ Soil health ↑ Water quality and quantity ↑ Air quality ↑ Rural economic/social vitality ↑ Healthy people ↑ Biodiversity ↑ Landscape resiliency ↑ Climate adaptation and climate change mitigation ↑ Equity
• Human and Social Capital (research, practitioner/farmer expertise, trust, relationships, GLBW collaborative network) • Assets and financial capital (funding, outreach materials, research sites, etc.)	• Work collaboratively and strategically to effect change together • Implement CLC through research, technical assistance, communications, policy, and market developments • Transform methods with strategic approaches to input and leadership with equity top of mind • Encourage and engage stakeholders	• Communications/ outreach/ educational tools • Supportive infrastructure and policies • # of perennial crops with diverse market opportunities				
On Farm Adoption:						
• New farm investments (training, farm inputs [seed, amendments], etc.) • Support and technical assistance network	• Application of CLC and best practices to farm context	• # of farms integrating perennial crops • # of acres/fields implementing CLC strategies				
Estimated Cost per acre per year (annualized): $148			**Projected Benefits per acre per year: $500**			

Logic Model Network Approach to CLC

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Continuous Living Cover Case Study:

THE SOCIAL AND ENVIRONMENTAL IMPACT OF **PERENNIAL FORAGE AND GRAZING IN THE UPPER MIDWEST**

This impact value map shows the estimated annualized cost per acre for pasture and grazing system establishment and the projected benefits per acre per year from adopting Perennial Forage and Grazing strategies, in comparison to conventional practices.[1]

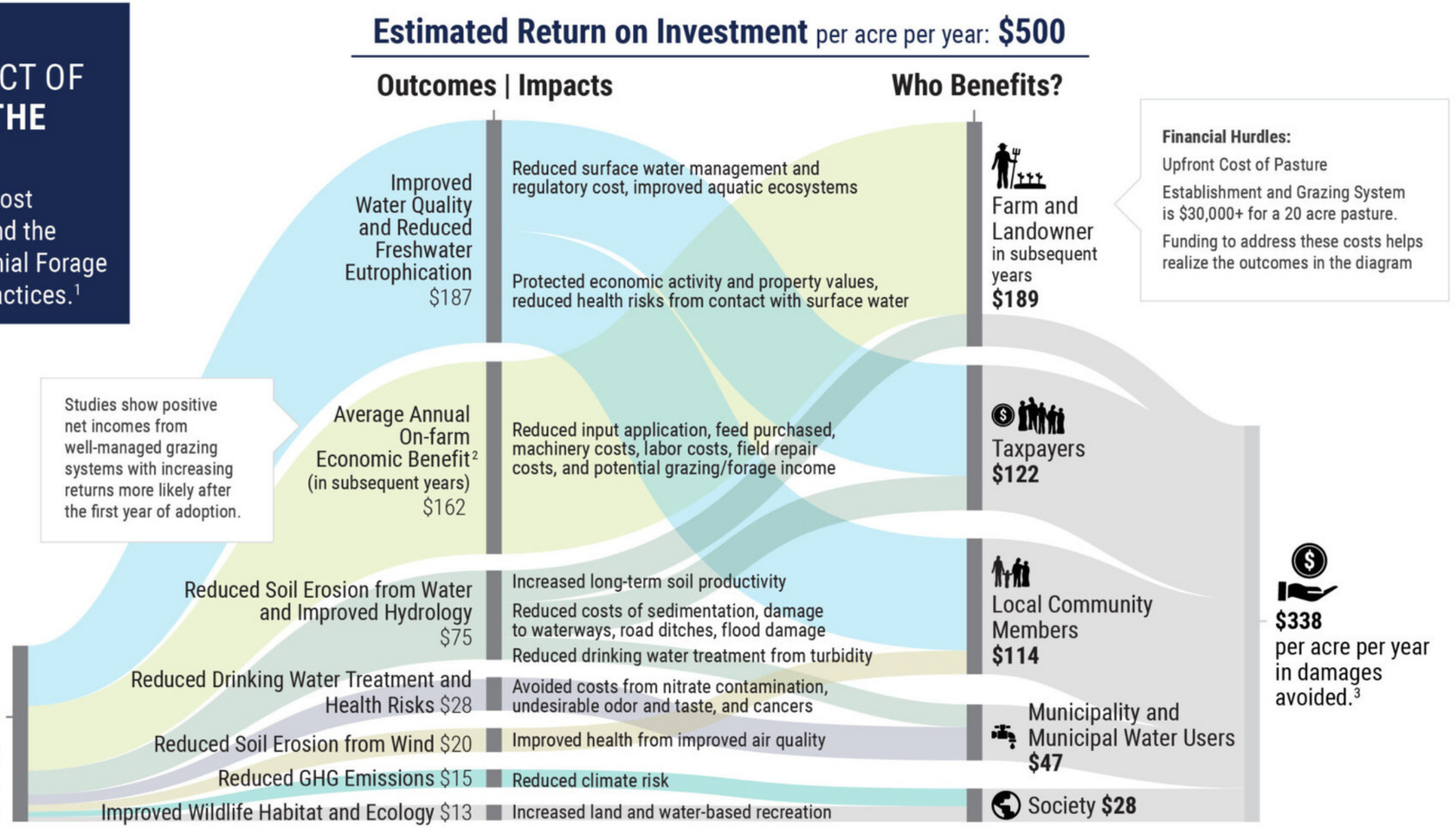
Projected Social Return on Investment

$1 → $3.38

For every $1 dollar invested in establishing a perennial grazing system there is a projected $3.38 in social and environmental value generated through net income gains, water quality, wildlife habitat, air quality and climate risk.

A 50% increase or decrease in both costs and benefits leads to an SROI range of $1.13 - $10.14.

Cost Scenario: 20 acre pasture establishment and production with costs for grass and legumes, depreciated over the 20 year expected lifespan of fencing and water system, and based on a partial enterprise budget. While figures here are amortized, establishment costs are an upfront investment.



1 Estimation is a modeled projection of value realized from Perennial Forage and Grazing practices in comparison to annual crops with cows on site, tilling, and no rotation or cover crops. Additional benefits per acre will vary over time, by location within the Upper Midwest, and as data availability changes.

2 This analysis utilizes a partial enterprise budget approach and assumes land costs are constant between production systems.

3 $27 benefit from reduced soil erosion is also a Farm benefit

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Impact Value Map for the Social and Environmental Impact of Perennial Forage and Grazing in the Upper Midwest

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Impact Analysis
Summary

PROJECT SUMMARY

KEY MESSAGE

For every $1 spent on pasture establishment and a well-managed grazing system, there is a **projected $3.38 social return on investment** (SROI) to farms, taxpayers, community members, and global society.

- The estimated return on investment per acre per year is $500 (not including land costs to the farmer and assuming land is owned).
- Average annualized cost per acre per year of perennial forage and grazing (PFG) system is estimated at $148 - assuming a 20 acre pasture, annualizing upfront investment costs over the 20 year expected lifespan of the fencing and water system.
- **Upfront investment costs and opportunity costs for the farmer are two financial hurdles that investors can help overcome** and in return foster larger environmental services as well as potentially support financial well-being on the farm.
- Beyond the large partial enterprise budget benefits attributed to the farm, taxpayers are the second largest beneficiary of the PFG system as a result of the avoided water quality damages from conventional row crops. The water quality benefits accrue through several channels including both direct and indirect cost savings - drinking water treatment costs, surface water management cost, regulatory costs, road and ditch repair, and improved aquatic ecosystems otherwise actively protected (such as through DNR efforts).
- Net GHG emission reductions are realized as a result of the full grazing system, but driven in large part by the carbon sequestration of perennial forage.

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