Analysis of Agricultural Carbon Sequestration Policy in Hawaii

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Prepared for: Hawaii Greenhouse Gas Sequestration Task Force
Overview

1. Our focus / Background
2. Problem Framework
3. Analysis Framework
4. Policy/Solution Analysis
5. Recommendations and Conclusion
Our focus

"Identify ... agricultural policies... options that would encourage agricultural ... practices and land use practices that would promote increased greenhouse gas sequestration, build healthy soils, and provide greenhouse gas benefits".
Climate-smart agriculture (CSA) is an approach that helps to guide actions needed to transform and reorient agricultural systems to **effectively support development and ensure food security in a changing climate.**
Agriculture is the science and production of plants and animals, to provide food, fiber, medicinal plants and other products to sustain and enhance life.

Agriculture accounts for:

- 12-14% of global greenhouse gas emissions
- 9% of the US GHG emissions
- 5% of Hawaii's carbon emissions
History of agriculture in Hawaii

- Hawaii’s agricultural land use has changed dramatically over the last 35 years.
- Polynesian voyagers landed in Hawaii
- Monocrop industry (first half of 20th century)
- Tourism (1950s)
- Plantation closures (1970s - 2016)
- Diversified farm activities and in small-scale
Characteristics of agriculture in Hawaii

✓ Farm size: 160 acres (average), 5 acres (median)
✓ Half of Hawaii’s farms are less than 5 acres and the vast majority of acreage is in ranch land
✓ Age of farmers is 60 years old and the majority of them are new farmers.
✓ Diverse micro-climates and soil orders
Status Quo

- Sustainable Hawaii Initiative (double local food production by 2020)
- No specific policy promoting carbon sequestration in agriculture
- Limited State and Federal funding for local farmers
Analysis Framework – Market Failure

- Social benefits of carbon sequestration
- Costs of sustainable practices on farmer
- Positive externality
- Incentives to offset farmers costs
Methods

- Review of agriculture industry and policies in Hawaii
- Review of policies across the US to promote soil health and carbon sequestration (e.g., California, Virginia, NY)
- Interviews
Policy instruments (US states)

- Cost-share payments
- Education, Demonstration, and Technical Assistance Initiatives
- Agricultural loans
- Payment for Ecosystem Services - PES
- Government labeling standards for private goods or certification schemes
Policy Alternatives

- Cost-share (75% of net costs)
- Full subsidization (100% of net costs)
- Payment for ecosystem services (PES)
- Status Quo
For all three alternatives we recommend:

Education, demonstration, and technical assistance

CURRENT PRACTICES  CURRENT PERCEPTIONS  LEADERS IN COMMUNITY
<table>
<thead>
<tr>
<th>Policy Goal</th>
<th>Impact category</th>
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</thead>
<tbody>
<tr>
<td>Economic Efficiency</td>
<td>Profits are greater than costs</td>
</tr>
<tr>
<td>Cost Effectiveness</td>
<td>Funds required per farmer (75% vs 100%), Scalability (# farmers), and Timing (when funds are released)</td>
</tr>
<tr>
<td>Equity</td>
<td>Fair distribution of benefits to all farmers</td>
</tr>
<tr>
<td>Consistency with other Policies</td>
<td>2020 Local food production &amp; current policies implemented in Hawaii as well as the other states.</td>
</tr>
<tr>
<td>Political Feasibility</td>
<td>Political weight of groups paying for and benefiting from this policy</td>
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**Impact categories for policy goals (Qualitative)**
Limitations

- Lack of quantitative data for Hawaii (e.g. carbon pools)
- Mainland experience does not translate perfectly to Hawaii
- Limited time and resources
<table>
<thead>
<tr>
<th></th>
<th>COST-SHARE</th>
<th>FULL SUBSIDY</th>
<th>PES</th>
<th>STATUS QUO</th>
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<tbody>
<tr>
<td>Economic Efficiency</td>
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<td>Moderate</td>
<td>Higher</td>
<td>Lower</td>
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<tr>
<td>Cost Effectiveness</td>
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<td>Moderate to Higher</td>
<td>Lower</td>
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Recommendations

(1) Cost share
(75% funding)
- Lower total cost
- Partnership with USDA (e.g. EQIP)

(2) PES
- Demands a pay of premium, higher administrative cost.
- Public-private partnership
Conclusion

- Market Failure
- Government Intervention
- Policy Options are Supplementary
- Future: Quantitative Benefit Cost Analysis
Questions?