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Title:

Agroecological Assessment of Farming in the Rural-Urban Interface: Building Resilient Regional Food Systems

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Key words:

Agroecology, farm assessment, innovation, local food, rural-urban interface, regional food systems, participatory research, resilience, sustainable agriculture, urbanization

Abstract

Farmland in urban-influenced regions produces the majority of vegetables and fruits grown in the U.S., yet rural-urban interface (RUI) farms are threatened by development pressure, climate change, economic conditions, and infrastructure loss (American_Farmland_Trust, 2007). Developing innovative marketing relationships and strategic policy alliances with urban consumers can potentially enhance farm viability. Community-led food system initiatives are designed to strengthen regional consumer-farmer linkages. Viable farms can increase local food production and access, enhance long-term food security, contribute to local economic development, and provide a wide range of ecosystem services. Clark County, with the sprawling city of Vancouver, offers a unique opportunity to investigate food system resilience at the farm level. This under-studied region hosts approximately 60 market and CSA farms.

We propose to develop and pilot an on-farm sustainability assessment tool that includes indicators for social, environmental, agronomic and economic parameters through participatory field research with 20 direct market farms. Results will document the usage of BIOAg practices,

highlight areas of farm vulnerability, and identify areas for improvement. The tool will be evaluated by farmers and made available for use in other regions.

This project addresses BIOAg priority areas of “social and economic dimensions” as well as the eligible topic areas of “innovation and diversification to increase the resiliency and sustainability of farming and foods systems” and “assessment of the environmental, economic, and/or social sustainability of agriculture and food systems that provide direction for needed improvements.” Our unique focus will benefit other assessment tools under development. Results will directly inform regional policy and farming practices.

Grant Project Description

To advance regional food system goals, this project investigates the challenges faced by rural-urban interface (RUI) farms as well as the contributions they make toward agroecological sustainability and food system resilience. Results will provide farmers, food system stakeholders, and policy-makers with research-based guidance for addressing the specific vulnerabilities of local agricultural production. Clark County food system stakeholders are endeavoring to retain and increase local food production and sourcing in a region with significant food insecurity and development pressure (Clark_County_Food_System_Council, 2012). As such regions face rapid loss of productive farmland and marginal farm economic viability, interest in alternative farm production and marketing strategies tends to increase (Freedgood & Royce, 2012; Meter, 2008; Ostrom & Donovan, 2013). Many Clark County farmers are marketing directly to consumers in the Portland-Vancouver region. In 2012, there were seven Farmers’ Markets and 20 community supported agriculture (CSA) operations in Clark County.

Our unique focus on conducting participatory research with direct market RUI farmers to assess their environmental, social and economic sustainability is designed to address critical gaps in knowledge. We propose to adapt and develop a sustainability assessment tool to pilot test on 20 farms in Southwest Washington. This user-friendly farm-level sustainability assessment approach is informed by agroecological perspectives (Wezel, 2009) and resilience frameworks (Cabell & Oelofse, 2012; I. Darnhofer, Fairweather, & Moller, 2010). Resilience thinking emphasizes the capacity to adapt and learn in order to achieve greater sustainability (Milestad & Darnhofer, 2003). Agroecological approaches are designed to enhance productive, economic, and social resilience (Hoffmaister, 2009).

By incorporating social and economic dimensions of sustainability this project will benefit other practitioners who are currently developing sustainability assessment tools. An interdisciplinary research team and advisory group—including scientists, Extension personnel (PI, co-PIs, and collaborators), farmers, and food system stakeholders—will help develop, implement, and evaluate this assessment tool. Ongoing evaluation is thereby integrated into each stage of participatory research project.

Objective One is to develop an agroecological farm assessment tool for direct market farms that uses indicators of economic, social, environmental, and agronomic sustainability and resilience;

Objective Two is to pilot test the assessment tool with 20 rural-urban interface (RUI) direct market farms;

Objective Three is to analyze results to document the key contributions of these farms toward agroecological sustainability and regional food system resilience and identify areas for improvement; and

Objective Four is to evaluate and share the tool and assessment results with other practitioners, partners and stakeholders.

Outputs

We began accessing the funds for this grant project in mid-October, 2013. This section reports on completed work to date. To summarize, we have (1) Established a project advisory group and identified 26 farmer research participants; (2) Refined the research questions to be addressed and developed an initial assessment framework pertaining to these questions; (3) Compiled information for two sections of the final report; and (4) Identified a team of local stakeholders and grant development partners. We have submitted additional proposals and identified extramural funding opportunities as summarized in the Additional Funding section.

- **Work Completed:**

As requested by our proposal reviewers, we have clarified and refined our research questions. Our key research questions for investigation are: 1) What are the current and potential areas of vulnerability for RUI food producing farms? 2) What will be needed to retain and enhance RUI food production capacity? 3) What are useful indicators of environmental, economic, and social resilience for RUI food producing farms and how can these indicators be systematically assessed in Clark County and similar areas? The research and outreach procedures outlined in the four stages of this project are designed to answer these research questions and accomplish the objectives set out above. Also in response to reviewer comments, we have elaborated the potential results and policy outcomes of the project and provided specific examples in the impacts section.

- **Stage One: Establish research team, advisory group, project management.**

To initiate this research project, work completed includes establishing a core group of stakeholder-advisors including farmers and representatives from conservation, marketing, retail, real estate, non-profits, and Extension. To establish this advisory group, we contacted numerous farmers, organizations, and specialists involved in planning, water quality, marketing, conservation, and agricultural education. Dialogue topics included farm resilience, land use, farming practices, markets, research needs, agricultural support systems, and policy-level implications.

We have identified an initial group of farmer research participants. We have approached and received informal interest in participating in this project from 26 farmers meeting the desired characteristics of our research sample. These farmers market directly to consumers in the Portland-Vancouver metro region through community supported agriculture (CSA), Farmers Markets, and farm stands. Seven on-farm events provided the opportunity for preliminary farm visits. A database of farmers and farm characteristics has been established. The next step is to distribute the research project summary and formalize these commitments. Then, regular communications with team members will be established.

The next team meeting will focus on the project objectives, work plan, and role of advisory members. An introduction to relevant research findings from other regions will inform advisory group members about the possible applications of the research findings for local agricultural education and assistance efforts, as well as the research needs of ongoing policy initiatives. Advisory group members will be invited to review and provide feedback on ideas for future funding submissions.

- o **Stage Two: Engage scientists and farmers in advising on development, implementation and evaluation of the assessment tool.**

Toward the development of the assessment tool, three sustainability assessment frameworks were compared in a spreadsheet and correlated with the indicator categories pertaining to the research questions. Environmental indicators cover farm practices for managing soil, pests, water, plant diversity, and conservation measures. Market and business strategies are included in the economic category, along with accessible financial data. Social strategies encompass participation in associations to access and share information or engage in policy.

The assessment framework under development has been informed by the following approaches: characteristics of farm resilience based on aspects of IFOAM's basic organic standards (Milestad & Darnhofer, 2003); "Public Goods" tool indicator categories developed by Gerrard et al (2012); and behavior-based indicators of agroecological resilience (Cabell & Oelofse, 2012). Examples of adaptive strategies found to enhance farm resilience involve (1) minimizing external inputs; (2) growing a diversity of crops and crop varieties for diverse markets; and (3) innovation, learning among farmers, and sharing information about different practices (Milestad & Darnhofer, 2003). These strategies are indicative of resilient agroecosystems (Cabell & Oelofse, 2012) and represent key attributes within the environmental, economic, and social realms of sustainable agriculture, respectively.

In addition to completing a review of leading resilience and sustainability assessment frameworks, we are reviewing the findings from other direct market farming systems research in Washington and urban fringe farm viability studies from other regions of the country. Two locally utilized self-assessment tools will be considered as well. The *Water Quality Self Assessment Guide for Small Acreages*ⁱ (Harwood, 2005) is a very basic and simple visual assessment tool that could inform our toolⁱⁱ. Second, Clark Conservation District implements the County's Habitat Conservation Ordinance designed to protect fish habitat on agricultural land. Riparian functions assessed through a simple kit include stream quality, fish and wildlife habitat.

We have begun drafting a list of interview questions associated with each indicator category on the spreadsheet. We will engage the project investigators and an advisory sub-committee to further refine and analyze the proposed indicator framework and the design of the associated on-farm interview and data collection protocol. Review of the on-farm interview and data gathering protocol includes criteria for user friendliness, time commitment, use of existing information and records, simplicity, and educational value for the farmers.

Year-two BIOAg grant funding will support the following stages of the project (along with ongoing aspects of Stages One and Two) as detailed in the original proposal:

- **Stage Three: Conduct on-farm assessments, process and analyze data, review results with farmer participants.**

On-farm assessments will involve the equivalent of one day of data gathering on each farm, with the target being 4 hours of the farmer's time. Quantitative data will be collected from existing records wherever possible. Interviews questions will cover social, economic, and other environmental resilience indicators co-developed for the assessment.

A roundtable meeting for farmer participants and advisors will be convened to share and evaluate assessment results and the effectiveness/usability of the tool—after a draft report summarizing the assessment results is circulated. The meeting will be used to confirm among participants that we have identified key farm vulnerabilities, risks, needs, and contributions before this information is shared with the public.

- **Stage Four: Report and Disseminate Findings**

The entire final report includes A) Literature review, tools review, background information and definitions for each assessment category and tool; B) Assessment tool questions, data types, and associated methods; C) Summaries of compiled and aggregated data, analyses, results, and comparisons to literature reviewed; D) Participatory methods review and tool component evaluation; and E) Conclusions and recommendations for various stakeholder and participant audiences. Dissemination includes a journal article, poster, and presentations for local (Clark County Food System Council), regional (Tilth Producers of Washington and Washington State Food System Roundtable), and national audiences.

- **Publications, Handouts, Other Text & Web Products:**

Progress has been made toward the completion of the first two sections of the final report: A) Literature review, tools review, background information and definitions; and B) Assessment tool questions. Early next year, the review of existing assessment tools will be completed, and pertinent literature will be summarized.

Once the 2012 Agricultural Census data is released, the contextual background information will be summarized using readily available data and information on agriculture in Clark County and state-wide. This information will allow us to characterize our farms and region in relation to other regions and farm types (American_Farmland_Trust & WSDA, 2008; Ostrom, 2010; Reganold, 1986).ⁱⁱⁱ

- **Outreach & Education Activities**

Ongoing outreach includes attendance and communicating about the project at monthly Clark County Food System Council meetings. The 20-member Council includes seven farmers representing a wide diversity of farm sizes, types, ages, and tenure in agriculture. Such venues relevant to farmers provide ongoing opportunities to share research project information, obtain feedback about policy research needs, and to dialogue about farm resilience issues. The upcoming Washington State Farmers Market Association (WSFMA) conference in Vancouver will provide another opportunity for project outreach through booths run by local farmers and the WSU Small Farms Program. Collaboration with Clark County Extension and their Cultivating Success farmer training courses in Agricultural Entrepreneurship and land management will

provide an ongoing opportunity to immediately incorporate findings into educational curricula and programs.

Impacts

This project responds to regional food system stakeholder goals to enhance the sustainability and capacity of local food production agriculture (Clark_County_Food_System_Council, 2013). As such, the project has short- and longer-term outcome objectives in policy and educational arenas. It will help define the future research, educational, and policy needs of local food producers. Participatory research results can be utilized to directly inform the small-scale farmers participating in the project, the advisory group members and collaborators, supporters of local agriculture, regional food system stakeholders, and policy-makers, in particular, the Clark County Food System Council. Beyond the region, results from this research project can help inform other local, regional, and state-level food policy councils on the needs and vulnerabilities of RUI food producers as well as develop practical tools and methodologies that can be employed by other farm sustainability and resilience researchers.

- **Short-term Impacts (Knowledge gained and shared)**

Perspectives vary on the best strategies to support small-scale farmers and local food production in this rapidly urbanizing region. This research will link a better understanding of farmer vulnerabilities, adaptive strategies, and current management practices to providers of education and technical assistance, as well as policy makers. The goal is to build the capacity for local food production agriculture, along with the environmental benefits.

Mutual sharing of knowledge about the agricultural situation in Clark County is a centerpiece of this research design. For example, engaging with the Food System Council has led us to review several Clark County agricultural economic analyses and policy recommendation documents, variously built upon available data, informant interviews, and stakeholder representation (Berk_Consulting, 2012; CC_Ag.Preservation_Committee, 2009; CC_Public_Health, 2012; Gilroy, 2008; Globalwise_Inc, 2007; Meter, 2008; Ostrom, 2010; Rural_Lands_Task_Force, 2010).

The challenge of documenting the multiple benefits of local food-production agriculture is playing out in the context of the update of the county's 2007 Comprehensive Growth Plan, currently underway. The Clark County Food System Council is requesting their goals be incorporated into the plan update. Goals include developing "tools and strategies to encourage conservation of designated agricultural land, support for...agricultural crops and products; increasing locally grown food access and food production opportunities; and creating local incentives" (Clark_County_Food_System_Council, 2012). Through our advisory group and outreach activities with the Food System Council, information gained from our project can be immediately used to inform these efforts to shape the county's Growth Plan.

In addition, our project has facilitated information exchange about the Council's proposal (2013) for the County Plan update with the Conservation District, Friends of Clark County, Salmon Creek Watershed Council, and the Columbia Land Trust. As these organizations interact with the local agricultural issues identified, mutual knowledge gains can be observed.

- **Intermediate-term impacts (current & expected change in behaviors)**

A shared policy objective is to build consensus for strategies that can actually work to help retain and support new farmers and protect farmland successfully. This participatory research can help identify both the potential contributions of local agriculture and types of assistance and interventions needed to address specific agricultural vulnerabilities. The assessment tool could facilitate relatively objective analyses of proposed strategies and policy instruments. For example, to assess the viability of establishing Agricultural Production Districts in parts of Clark County, data from this research will be organized geographically. In addition, information about the small-scale farm sector can be used to inform planned market feasibility studies.

We also plan to work closely with the Conservation District on program development opportunities. This project aligns with several aspects of the Clark Conservation District (CCD) strategic plan. For example, CCD goals focus on: educating landowners about strategies aimed toward agricultural viability and keeping land in farming; and providing education and resources for landowners and developers on conservation, soils and water protection measures. Further, the CCD implements the County's Habitat Conservation Ordinance designed to protect fish habitat on agricultural land. We expect that our research findings will directly influence the direction of CCD programs and resource investments.

- **Long-term (potential change in economic/environmental/social situations)**

By illuminating how farmers build resilience—on their farms, in their efforts to enhance soil health and environmental quality, by pursuing market diversification strategies, and through learning, sharing and innovations—this research aims to inform stakeholders about how to better support farmers and farmland resource protection, and influence the direction of work by researchers, educators, planners and policy makers. More informed support for local farmers and farmland protection should improve farm resilience in the face of multiple challenges and ideally, help scale-up the capacity for the sustainable production of food within an RUI. The intent of this research is to support farm and farmland retention, the intensification of local food production, and the environmental benefits of agriculture in this region over the long-term.

Additional Funding Applied For / Secured

- **Grants Applied For**

Secured:

1. Ostrom, M. and C. Donovan. "Is this Local?" Federal-State Marketing Improvement Program, USDA Agricultural Marketing Service (2013-1016). \$76,633.
2. Moulton, C; Collins D; Ostrom, M. and Jose Garcia-Pabon, "Farm Business Management Educational Program for Washington State," USDA Risk Management Agency, RME Program (2013-2014), \$96,613, includes funding, curriculum, and coordination for Cultivating Success farmer educational program in Clark County.

Rejected:

3. Schahczenski, J.; Andrews, S; Ostrom, M; and C. Schahczenski, "Understanding How to Motivate Climate Friendly Agricultural Practices," proposal submitted to USDA AFRI NIFA through the National Center for Appropriate Technology (2014-2016), \$678,705

Pending:

4. Peterson, H.; Feenstra, G; Hardesty, S; Ostrom, M; Tanaka, K, "Impacts of Values-Based Supply Chains on Small and Medium-Sized Farms," proposal submitted to USDA AFRI NIFA through Kansas State University (2014-2016) \$500,000.

- **Future Funding**

Improving small and mid-sized farm viability and their environmental practices is the goal of several major USDA grant programs. The farmers and other collaborators associated with this project, including the Clark County Conservation District, will be involved in the preparation of three future funding applications that have deadlines in March, June, and December, 2014. Because this BIOAg project is designed to identify producer vulnerabilities (risk and threats to farm viability) and the associated strategies, models, research and education that can mitigate these threats, the results from this project will be readily applicable to the development of these and future proposals.

1. Western SARE Research and Education pre-proposal, due June 2014.

The Western SARE conference *Strengthening Agriculture's Infrastructure* (2012),^{iv} highlighted the importance of supporting small and mid-sized farm viability through improving regional market linkages. The keynote speaker provided evidence that "local foods may be the best path to economic recovery." Another speaker, Fred Kirschenmann, recommended applying *Resilience Thinking* (Walker & Salt, 2006) and supporting production and distribution models that engage younger farmers and rely on more cooperation to supply food to regional markets.

SARE has funded two sustainability assessments that apply to different systems. The participatory development and testing of a sustainability assessment process was funded by Western SARE for a degraded rangeland in Arizona (Melgar, 2012, GW12-064). The project emphasizes local knowledge sharing and involves multiple stakeholders. Eastern SARE funded the development of a whole-farm dairy assessment approach for NY farm advisor monitoring that relies on laboratory testing (Agricultural Environmental Indicators, ENE09-112, 2012).

2. The Western Center for Risk Management Education's Extension Risk Management Education (RME) proposals, due early December, 2014.

The RME program funds "organizations with a demonstrated capacity to develop and deliver results/outcome-based risk management education and training programs to agricultural producers and their families." Several cooperators on this project, including WSU Extension and Clark Conservation District, will be in a good position to request this funding to support expanded local educational programming to improve local farm viability. Quoting from the 2014 request for proposals, this project's participatory assessment and informs "training that provides decision tools, practices and other risk management strategies that farmers and ranchers can adopt to improve their economic viability." Our project goals dovetail with this program as they will inform "education projects designed to help farmers and ranchers select and use tools and

approaches that can reduce the adverse economic effects of the uncertainties of weather, yields, prices, credit, government policies, global markets and other factors, including human resources and legal issues – all of which may result in wide swings in farm income or threaten the economic viability of the farm or ranch” (FY 2014 RFA).

3. The Conservation Innovation Grants (CIG)

Funded through Natural Resource Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP), CIG will provide an additional opportunity to fund new educational programs related to needs identified in this project. Clark Conservation District is an eligible CIG applicant who can meet the criteria needed to “promote the development and adoption of innovative approaches.”

4. USDA NIFA AFRI Competitive Grants Program

If continued, the AFRI RFP has a section under Section F targeted specifically at “improving small and medium-sized farm viability” (see: <http://www.nifa.usda.gov/funding/rfas/afri.html>). The Clark County collaborators and researchers will be well-situated to cooperate with researchers from other regions in refining and applying the assessment methodologies developed under this BIOAg project at a wider geographic scale.

Graduate student funded

Grant funding for this project was accessed in October, 2013, to support Judith Wait’s Research Assistant (RA) position as an Environmental and Natural Resource Science (ENRS) doctoral student based at WSU Vancouver.

Recommendations for Future Research

Given the high rates of small and medium-sized farm loss in Washington, as in other regions of the U.S. (Ostrom and Donovan 2013), the need for further research on the factors that contribute to maintaining farm viability in the face of multiple environmental, social, and economic threats is clear. The emergence of local, regional, and state-level food policy groups in Washington and the growing consumer demand for accessible, sustainably raised local foods have further highlighted the need for a better understanding of the strategies that can successfully retain and enhance local food production capacity.

The guiding principles set out in the charter document of the Washington Food Systems Roundtable formed in response to Governor Executive order # 10-02, include “Protecting and improving the environment (land use, water, transportation, energy, aquatic resources, waste management, etc.) through agricultural best practices, protection and wise use of natural resources,” “increasing demand and supply for Washington grown food,” “preserving and protecting farmland for food production,” “promoting food production as a viable economic activity, and ensuring that farmers have access to the necessary resources including land, soil, water, and labor,” and “enabling connections among small-scale producers and consumers to support a sustainable farming network.” Ostrom serves on this Roundtable and will take the opportunity to share our BIOAg project research results in the hopes of building collaborations for expanded research projects of this type in the future.

The application of a resilience framework at the farm level is a nascent and needed field of research, especially considering the importance of understanding farmers’ practices, preferences,

decisions, goals, and abilities (Ika Darnhofer, Moller, & Fairweather, 2008). With the farm and farmer as the central focus, the participatory development and implementation of a resilience assessment and the results obtained will not only serve Clark County, but can easily be adapted for similarly situated regions and communities, and provide useful guidance for a variety of policy-makers concerned with regional food system development.

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ⁱ Harwood, Erin. (2005) WSU Extension Clark County; Clark County Environmental Services

ⁱⁱ <http://clark.wsu.edu/horticulture/smallAcreageProgram.html>

ⁱⁱⁱ www.nass.usda.gov/Statistics_by_State/...Bulletin/annual2011.pdf

http://www.nass.usda.gov/Statistics_by_State/Washington/Publications/Annual_Statistica1_Bulletin/2011/content11.asp

^{iv} <http://www.westernsare.org/Conferences/Strengthening-Agriculture-s-Infrastructure-Conference>