Title:

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

Principal Investigator

- Marcia Ostrom, Associate Professor, School of the Environment; WSU Small Farms Program Leader, CSANR;

Co-Principal Investigators

- Lynne Carpenter-Boggs, Associate Professor, Dept. of Crop and Soil Sciences, WSU
- Jessica Goldberger, Associate Professor, Agricultural and Food Systems, Dept. of Crop and Soil Sciences, WSU
- Paul Thiers, Associate Professor, Political Science, WSU Vancouver
- M. Jahi Chappell, Ph.D., Adjunct Faculty, School of the Environment, WSU Vancouver
- Judith Wait, Doctoral student, Environmental & Natural Resource Science (ENRS)

Cooperators:

- WSU Extension Small Farms Team; WSU Clark County Extension
- Advisors: Erin Harwood: CSA farmer, Clark County Food System Council member; Farmers Jim and Diane Hunter; Dr. Charles Benbrook, advisor on assessment tool; Denise Smee, Clark Conservation District Manager; Ann Foster, Salmon Creek Farmers' Market manager and Clark County Food System Council member; Lynn Krogseng, retail and local food system expert; Richard Sievers, farmer-advisor; Rebecca Neville, Agroecologist/ biodiversity scientist and community gardener, Roben White, urban farmer and Food System CARE director; Valerie Alexander, farmer, Friends of Clark County board member.

Key words:

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

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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 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 more than 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. By documenting the usage of BIOAg practices and areas of farm vulnerability, areas for improvement will be prioritized. The tool will be evaluated by farmers and made available for use in other regions. 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. 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 (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). In 2012, there were seven Farmers' Markets and 20 community supported agriculture (CSA) operations in Clark County.

Research-based guidance for addressing the specific vulnerabilities of local agricultural production is needed. As such, we propose to adapt and develop a user-friendly assessment tool to pilot test on 20 farms in Southwest Washington. Our unique focus on conducting participatory research with direct market RUI farmers is designed to address critical gaps in knowledge. The interdisciplinary research team and advisors will help develop, implement, and evaluate the assessment tool.

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

A summary of the work completed to date is as follows:

(1) We expanded the project advisory group and conducted outreach to stakeholders at local agri-food system meetings. To get more feedback, project summary documents were shared. Brief presentations were made at meetings to explain the research questions, objectives, and motivation. The conversations generated additional participant confirmations.

(2) Through additional outreach, and by compiling lists from multiple sources as baseline information, 146 farms have been identified that can be plotted on contextual base maps.

(3) To refine the assessment framework, we are pilot testing protocols for assessing soil quality, biodiversity, and socio-economic resilience at two urban farm sites;

(4) Information for two sections of the final report was compiled: A) Literature review, tools review, background information and definitions for each assessment category and tool; and B) Assessment tool questions, data types, and associated methods. As we begin to work with the 2012 Agricultural Census data, the report section on Clark County's agriculture will be further revised. It will contribute to the Food System Council's Ag Land Conservation Campaign economic impact analysis statement.

(5) Working with Clark County based grant development partners and producers, we pursued opportunities to fund associated projects beneficial to food security, farmers' needs, agroecosystem biodiversity, and regional agri-food system sustainability.

- **Work Completed:**

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?

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

We established a core group of stakeholder-advisors including farmers and representatives from conservation, marketing, retail, real estate, non-profits, and Extension. As baseline information compiled from multiple sources, 146 farms have been identified that can be displayed on a Clark County cropland basemap. More will likely be added through input from local experts and advisors. Since there is no other comprehensive delineation of the characteristics of agriculture in Clark County from a food production standpoint, this product will also be useful to community partners and other researchers. Our farm database also includes parcel information about County zoning, soils, environmental ordinances, watershed location, and buffers. The current list includes 91 farms that apparently market directly to consumers. Based on a better understanding of the scope of direct market farming systems in the region, a final group of 20 participants for in-depth, on-farm research will be selected.

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

Piloting field-based assessment methods is underway, including soil testing and biodiversity indicators. 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 group participation and less formal associations used to access and share information or engage in policy. 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 & Oelosfse, 2012) and represent key attributes within the environmental, economic, and social realms of sustainable agriculture, respectively. We are drafting and refining the list of interview questions associated with each indicator category.

Two locally utilized self-assessment tools will be piloted with a farmer-advisor to see if they contain the elements could be useful to our study. He already falls under the jurisdiction of the County's Habitat Conservation Ordinance designed to protect fish habitat on agricultural land. The ordinance is administered by the Clark Conservation District. In addition, the *Water Quality Self Assessment Guide for Small Acreages*[i] (Harwood, 2005) is a very simple visual assessment tool that could inform our tool, and is administered by WSU Extension's Small Acreage program coordinator.[ii] Nearly 60 farms on the list (of 146) are subject to the Ordinance, 39 of which are also direct market farms.

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

Data collection from existing publicly available records is proceeding. Farmers will be asked to confirm web-based information, and we will request other existing information. In-depth 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. Interview 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.

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

The entire final report will include 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:**

We distributed the research project summary at a variety of organizational forums and through individual communications, in order to confirm commitments. The summary documents briefly introduce the project objectives and role of advisory members. Relevant research findings are included in longer versions. Giving presentations about our research proposal at meetings with the Food System Council, Friends of Clark County, and the Salmon Creek Farmers' Market producers generated mutually informative discussions.

Progress has been made toward the completion of the first two sections of the final report (See also Stage 4, above). Augmented by the 2012 Agricultural Census data being released this year, the contextual background information will be summarized. The compilation of readily available data and information on farms and agriculture in Clark County is proceeding. We hope to contextualize and 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**

We have been communicating with the individual farmers and advisors, Clark Conservation District, Salmon Creek Watershed Council, and the Columbia Land Trust, as well as networking at Farmers' Markets, and Intertwine Alliance' Clark County conservation coalition network.

Participating in the Clark County Cultivating Success course: Agricultural Entrepreneurship and Business Planning, and attending other educational workshops, provided opportunities to dialogue with farmers and hone interview questions pertinent to this project. The Washington State Farmers Market Association (WSFMA) conference in Vancouver was another opportunity for project outreach through booths run by local farmers and the WSU Small Farms Program. Outreach at Farmers' Markets has resumed now that the market season is in full swing. Attendance and communicating about the project at monthly Clark County Food System Council meetings keeps us mutually informed about relevant policy implications. The PI and a member of the Council are also members of the Washington State Food System Roundtable (IAW, January 2012).

Impacts

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

The Clark County agricultural economic analyses and policy recommendation documents we reviewed are variously built upon available data, informant interviews, and stakeholder representation (Berk_Consulting, 2012; ClarkCounty_Ag.Preservation_Committee, 2009; ClarkCounty_Public_Health, 2012; Gilroy, 2008; Globalwise_Inc, 2007; Meter, 2008; Ostrom, 2010; Rural_Lands_Task_Force, 2010). Some analyses are inconsistent in purpose, scope, and economic implications. Existing reports list challenges faced by the agricultural community, but few of the recommended solutions to overcome barriers have been implemented. Alongside a lack of implementation and diminished farming sector base, several helpful programs have been cut from County, State[iv] and Federal Farm Bill budgets—trends counter to the need for agricultural assistance programs to farmers.

The reports were informed by diverse stakeholders including several Clark County farmers (ClarkCounty_Ag.Preservation_Committee, 2009; Gilroy, 2008; Rural_Lands_Task_Force, 2010), and their recommendations echo Statewide studies (WSDA, 2009). Our research should help to ensure farmers' perspectives and aspirations are supported.

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

This project responds to Clark County food system stakeholder goals to enhance the sustainability and capacity of local food production agriculture (2013). Information gained from our project also informs efforts to shape the County's Comprehensive Growth Plan. 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. 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. A baseline map of agricultural food producing farms is needed. The WSU Extension Farm Finder database, listing only 120 of the farms on our list, could be populated more thoroughly and updated.

This participatory research can help prioritize the types of assistance and interventions needed to address specific agricultural vulnerabilities. This project also aligns with several aspects of the Clark Conservation District (CCD) strategic plan. Information about the small-scale farm sector can be used to inform needed market feasibility studies.

- **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. It will influence the direction of work by community groups, 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. The need to scale-up the capacity for the sustainable production of food in urbanizing areas is pressing. 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

We are continuing to pursue program development opportunities with producers, community partners, advisors, Clark County Extension agents, and the Conservation District.

- **Most Recent Grant Proposals**

Secured:

1. 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.

Pending:

2. 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 Farm Bill grant and incentive programs.

1. Western SARE

We are pursuing partnerships for a proposal including five primary producer-cooperators and professional agricultural advisors, targeting the December 3, 2014 deadline.

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

Several cooperators, including WSU Extension and Clark Conservation District, will be in a good position to request funding to support expanded research, outreach, and education programs designed to improve local farm viability.

3. The Conservation Innovation Grants (CIG)

Funded through Natural Resource Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP), CIG will hopefully be available this year.

4. USDA NIFA AFRI Competitive Grants Program

The Clark County collaborators are well-situated to cooperate with researchers from other regions in refining assessment methodologies developed under this BIOAg project.

Graduate student funded

The BIOAg grant was accessed in October, 2013. The budget primarily supports Judith Wait's Research Assistant (RA) position through May 2015. She is an Environmental and Natural Resource Science (ENRS) doctoral student based at WSU Vancouver. The PI and co-PIs on this grant serve as her graduate committee.

Recommendations for Future Research

Given the high rates of small and medium-sized farm loss in Washington (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.

As urbanizing Counties with significant agriculture sectors across the U.S. struggle with similar challenges (Esseks, Oberholtzer, Clancy, Lapping, & Zurbrugg, 2009), case studies are very informative. Even considering the environmental challenges for urban area agriculture in the United States, recent research confirms the inadequate levels of funding for multi-disciplinary research on urban agriculture, farmer education programs, and initiative expansion (Wortman & Lovell, 2013). Funders prioritize support for larger collaborative projects, such as USDA and members of the Funders Network (Hodgson, Campbell, & Bailkey, 2011). Research that can inform the implementation of solutions is needed, and could foster collaboration across technical, educational, economic, and policy sectors.

This project is designed to deepen our understanding of producer vulnerabilities (risk and threats to farm viability). Findings, and the research process itself, will help prioritize mitigation measures to overcome the barriers. As land use and agricultural policy, food security, and local marketing initiatives depend on local farms being viable, our research involving southwest Washington farmers garners supportive alliances with a broad spectrum of community members.

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 (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. Research can 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**/annual**2011**.pdf
[iv] Clark County cut the Watershed Stewards (http://clark.wsu.edu/) program, and part of Master Gardeners funding. Washington defunded programs in 2008 and 2011 for farm viability, marketing, food access (see IAW 2012).