

Building Our Sustainable Future through Community Engagement: Developing a foundation for community-informed research and education devoted to the creation of a sustainable community

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Description

In the wake of the 2018 Labor Day flooding of Wildcat Creek the City of Manhattan and Riley County began leading the way toward building resilience in the community by developing and implementing the Resilient Riley County Plan. By creating a public process to address the physical and social vulnerabilities of residents, business owners, and public infrastructure associated with flooding the City and County are beginning a transition towards a more resilient and sustainable future for the community. While the initial emphasis of the Resilient Riley County Plan focuses on identifying and addressing flood risks, many in the community recognize that a long-term commitment towards improving social, economic, built environment, and natural environment resilience is needed to build the general sustainability of the community. As a major player in the Manhattan community, and a source of knowledge and expertise on resilience and sustainability from many disciplinary fields, Kansas State University (KSU) should actively contribute to the development of a more resilient and sustainable Riley County.

The proposed project will build a foundation for community-informed research and service-based education in Riley County devoted to the creation of a sustainable community. This project will support the development of a growing partnership between the Riley County community and faculty at Kansas State University with interests and expertise in community sustainability and resilience by:

1. offering an educational outreach workshop on flooding and flood risks for the general public
2. studying the contribution of rainfall and land use changes to recent flooding in the Wildcat Creek Watershed, and
3. developing an online platform for open sharing of the results of research projects, student class projects, and data related to Riley County sustainability and resilience studies.

The **long-term goal** of the project is to develop a formal and long-lasting Community-KSU partnership with the deliberate intention of identifying and implementing sustainability solutions in Riley County, educating students in K-Higher Education about sustainability issues, educating the general public about individual actions they can take to be more sustainable and providing the support for them to use that information, and producing novel community-informed research in the area of sustainability sciences.

Background and Relevance

Much research on sustainability issues has noted that a major barrier to achieving sustainability is related to the “buy-in” of local stakeholders¹. Proposed sustainability solutions that do not fully consider the needs, expectations, and culture of the local community often get little traction among community members and consequently have little effect. As such, there is a growing call for greater engagement with communities via participatory and multidisciplinary research methods, living laboratories, and educational outreach^{2,3}. These participatory and multidisciplinary research methods are increasingly well-regarded by major funding agencies such as the National

¹ Matson, P., Clark, W. C., & Andersson, K. (2016). Pursuing sustainability: a guide to the science and practice. Princeton University Press.

² Mosier, S., & Ruxton, M. (2018). Sustainability university–community partnerships: Lessons for practitioners and scholars from highly sustainable communities. *Environment and Planning C: Politics and Space*, 36(3), 479-495.

³ Withycombe Keeler, L., Beaudoin, F., Lerner, A., John, B., Beecroft, R., Tamm, K., ... & Lang, D. (2018). Transferring sustainability solutions across contexts through city–university partnerships. *Sustainability*, 10(9), 2966.

Science Foundation (e.g. CNH2, HDBE, and CONVERGE). Living laboratories themselves are increasingly common at top research universities, but have only recently begun to be implemented at the community level, with only 5% of living laboratories in community spaces⁴.

Given the existing strong ties between KSU and the community and the land grant mission of the university, the Riley County area is ideally poised to develop a strong and lasting community-university partnership around local sustainability issues. While ties between the local community and KSU are strong, much collaboration in the area of community sustainability is organized on an individual basis by university faculty and often does not result in lasting partnerships. Sustainability research has shown that “boundary organizations” composed of multidisciplinary academic teams and local community leaders, that serve as bridges between various stakeholders in a community, play a vital role in developing and maintaining the relationships needed to produce engaged research and outreach activities with a positive impact on sustainability¹. The partnership this project aims to develop would serve to create a structure for collaboration and engagement on community sustainability issues that will:

- promote data and information sharing,
- create opportunities for conducting participatory research,
- designate Wildcat Creek Watershed as a “living laboratory” where student and faculty research projects and teaching activities be carried out,
- lay the groundwork for service-learning activities in KSU courses and for educational outreach activities with the community, and
- provide mutual support in applications for external funding

by developing a working group composed of community and university stakeholders that will coordinate, promote, and disseminate collaborative teaching, research, and service opportunities related to local community sustainability and resilience.

The foundations of this proposed partnership are actively being developed by a core group of KSU faculty led by Dr. Nelson and a “resilience champion” in the Manhattan Office of Community Planning and Development, Chad Bunger. This group is currently organizing a meeting with a broader group of stakeholders from the community including representatives from the city and county government, Fort Riley, and local community leaders. As a first step faculty at KSU have already begun to integrate local community sustainability issues into their coursework. For example, Professors Howard Hahn and Hyung Jin Kim are teaching a design class in spring and summer 2019 in which students are examining potential redesign options for the commercial and residential areas near Wildcat Creek that was devastated during the Labor Day flood. For the summer 2019 studio, Professors Hahn and Kim are also submitting a CECD matched funding request as early steps of our more comprehensive and longer-term initiative. In addition, members of the collaborative group plan to promote teaching and research efforts related to sustainability in Riley County at the “Dialogue on Sustainability”, an annual event organized by the Consortium for Environmental Stewardship and Sustainability (led by Dr. Larry Erickson) that is held during the summer at KSU.

Project Activities and Timeline

In order to garner support for a formal and deliberate partnership from our community partners we are proposing three activities that align with the categories of teaching, research, and service. The first activity is an educational outreach workshop on flooding and flood risks for the general public to be held in collaboration with city officials. This workshop (~ 2 hours) would be a follow-up to the open forum on Wildcat Creek held in October of 2018 that would be oriented towards providing basic knowledge on the science of flooding, flood risk and flood mitigation policy, and flood preparedness options. Workshop materials will be further shared with and disseminated

⁴ Silver, J., & Marvin, S. (2016). The urban laboratory and emerging sites of urban experimentation. In *The experimental city* (pp. 67-80). Routledge.

to local students in grades 7-12 via the Girls Researching Our World (GROW) and Exploring Science, Technology, and Engineering (EXCITE) workshops organized by the Office for the Advancement of Women in Science and Engineering (KAWSE). Planning for the workshops (by the PIs and all collaborating partners) will take place during Summer 2019 and the workshops will be held during Fall 2019 – Spring 2020.

The second activity is a research project investigating contributions of rainfall and land use changes to recent flooding events in the Wildcat Creek watershed. This research is supported by our community collaborator, Chad Bunger, and would include contributions from Dr. Rahmani, Dr. Nelson, and two undergraduate research assistants (URA). This project would be slated to start in Fall 2019 with an estimated completion in Summer/Fall 2020. One URA will assist Dr. Nelson with the development of a geospatial database of land use and soil data to be used in the study, land use change analyses and spatial analyses. A second URA will work with Dr. Rahmani to collect precipitation and streamflow data and conduct precipitation and flood frequency analyses. The URAs will further assist with the preparation of a summary report for city officials and a manuscript on the study during Summer/Fall 2020.

The third activity is the development of a website for dissemination and sharing of results of research projects, student class projects, and data related to Riley County sustainability and resilience studies. This final activity will develop the infrastructure needed to disseminate the work of the community-KSU partnership and to promote efficient sharing of data resources and would be carried out during Fall 2020 – Spring 2021. Prior to Fall 2020 the PIs and collaborating faculty will request and compile data on local sustainability issues from across the university and community. An undergraduate assistant will work with Dr. Nelson to build a website for the community-KSU partnership that will host a StoryMap of recent student projects related to Riley County sustainability as well as publicly available shared data in Fall 2020. This student will further work with faculty to design and implement a data sharing platform to be hosted on the developed website in Spring 2021. Collaborator input and guidance will be solicited at bi-annual meetings and used to refine the design of the website and the data sharing platform.

Project Outcomes

The three proposed project activities will contribute to the creation of a formal community-KSU partnership on Riley County sustainability issues by demonstrating to the community the level of dedication, commitment, and responsiveness that they can expect from participating faculty on local sustainability and resilience initiatives. These activities will assist in developing a shared-basis of understanding and trust that may improve levels of cooperation, commitment and support from the community. Provided that a strong working partnership is successfully formed, the collaborative efforts of participants will assist in achieving long-term sustainability in the community. In addition, the partnership will form the basis for novel participatory research, outreach and education opportunities, and will support additional sustainability and resilience research at the university.

Impact for all Partners

The proposed activities will support faculty applying for external funding by providing a mechanism for integrating broader impacts into their research, teaching, and service activities; increasing visibility of sustainability research at the university; and developing a core working group of sustainability researchers. In addition, the partnership will establish Manhattan and the Riley County area as a leading sustainable community and as a role model for other communities (particularly those in the plains states) trying to determine how to take action to improve their sustainability. The partnership will also produce additional opportunities for community-KSU teams to apply for external funding for developing and implementing sustainability solutions in the community available from agencies such as HUD, NOAA, KDHE, EPA, and USDA.

Supplemental/Matching Funding

The Department of Geography will contribute up to \$250 in supplemental funding to support any additional unexpected costs incurred for the educational workshops or to support additional hours of part-time work on the developed website by the undergraduate assistant.

Table 2: Detailed Timeline of Proposed Activities

		Jul-Sept 2019	Oct-Dec 2019	Jan-Mar 2020	Apr-Jun 2020	Jul-Sept 2020	Oct-Dec 2020	Jan-Mar 2021	Apr-Jun 2021
Workshop(s)	Faculty and community partners plan and advertise workshop(s)								
	Faculty and community partners hold workshop(s) and collect feedback								
Flooding Research	Undergraduate researchers develop geospatial and temporal databases of study data								
	Faculty and undergraduate researchers conduct land-use change and hydrological analyses								
	Faculty perform spatial and statistical analyses								
	Faculty and undergraduate researcher finalize study results and prepare manuscript								
Website	Dr. Nelson creates a StoryMap of recent student projects related to Riley County sustainability								
	Undergraduate assistant works with faculty to design and build a website for the community-KSU partnership								
	Faculty request and compile data on local sustainability issues from across the university and community								
	Undergraduate assistant works with faculty to design and implement a data sharing platform to be hosted on the developed website								