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Challenges to production agriculture in Pottawatomie County, Kansas, USA

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Abstract

Pottawatomie County, Kansas, features Flint Hills prairie, Oregon Trail history, lots of livestock, and commodity crop production. In 2023, it posted the highest population growth rate in Kansas, with high rates of community well-being and exurban and suburban sprawl. For farmers who have depended on maintaining and adding contiguous farmland to their operations, it has become increasingly difficult for them to compete with the prices that residential and business developers offer for farmland. Primary-occupation farmers also feel threatened by concentrated farm sales, redistricting, and an expanded county commission. I used Flora et al.'s (2016) community capital framework to assess rising tensions between and among stakeholders with interests in farming and nonfarm stakeholders with interests in development. Social capital—which includes social trust, networks, and shared values that people can cultivate and use to improve their livelihoods—was especially germane. To better understand the nature of social capital within and between the two stakeholder groups, I integrated the eco-social symbiotic spectrum (ranging from mutualism to competition) to perform a reflexive thematic analysis of 22 semi-structured interviews. Interviewees shared their experiences with, and perceptions of, the changing county dynamics, revealing how different symbiotic rela-

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tionships influenced social capital accrual. Interviewees' perceptions largely depended on their occupation. Primary-occupation farmers viewed their relationships with development stakeholders as parasitic, with the latter benefiting from the former, and their relationships with other farmers as competitive, undermining their social capital. Conversely, secondary-occupation farmers and community leaders expressed commensalism and mutualism with their networks. To ease tensions among stakeholder groups, the county and/or certain townships could implement property tax reforms —to reduce the degree to which farmland owners subsidize exurban and suburban expansion—and invest in more locally produced specialty crop infrastructure.

Keywords
community capitals framework, development, eco-social symbiosis, Pottawatomie County, Kansas, primary-occupation farmers, qualitative methods, social capital, well-being

Introduction

The expansion of exurban and suburban development into historically agricultural areas has emerged as a defining challenge for U.S. farmers and rural communities in the 21st century (Gazillo & Paterson, 2025; Meijerink & Roza, 2007; Satterthwaite et al., 2010). Nonfarmers and commercial and residential developers continually seek to purchase farmland (Halperin, 2023). Xie et al. (2023) projected that, by 2040, if "development continues at the same pace … this increase would collectively result in 18.2 million acres of agricultural land lost and fragmented" (p. 16).

Land use transitions can disrupt agricultural economies, erode farming communities' social cohesion, exacerbate rural-urban tensions, and shift local policy priorities away from land stewardship (Clark et al., 2014; Flora et al., 2016; Tickamyer, 2006). Commercial and residential development reshapes social, economic, and environmental conditions for farmers and nonfarmers alike (An et al., 2011; Inwood & Clark, 2013; Oberholtzer et al., 2010).

I investigated how these tensions manifested in one rapidly changing locale: Pottawatomie County (PT). In 2023, PT recorded the fastest population growth among all 105 Kansas counties (Self, 2023). PT's economic and social changes, driven in part by agricultural research and biosecurity investments, created the complex context for interactions between two groups: (1) stakeholders with interests in farming, and (2) nonfarm stakeholders with interests in development.

Given these tensions and dynamic social forces, I asked: *How have farming and development stakeholder groups perceived and experienced the emerging relationships between and among them*? To answer, I integrated the community capitals framework's (CCF) concept of social capital with the eco-social symbiosis spectrum to analyze the character of these stakeholder relationships.

By performing a reflexive thematic analysis of 22 semi-structured interviews, I studied how farmers' occupation type (primary versus secondary) influenced perceptions of stakeholder groups. This knowledge can give PT and other community leaders improved insights into their leadership situations and contexts, enabling them to more effectively balance the complex considerations for advancing mutualism and community well-being.

Theoretical Framework

The theoretical framework included the community capitals framework's social capital concept integrated with eco-social symbiosis.

Community Capitals Framework (CCF)

Communities can help steward Earth's working landscapes by harnessing various forms of 'capital,' or the resources people invest into communities to create more resources for the future (Emery & Flora, 2006). Flora et al.'s (2016) CCF incorporated the aims of a healthy ecosystem, vital community, and social well-being, and has been used to take stock of resources in counties experiencing economic and social changes. CCF was an appropriate theoretical framework for PT given that its residents experienced significant increases in housing stock and new business infrastructure, economic activity, population, and well-being, while being surrounded by agricultural farmland. According to the Pottawattamie County Economic Development

Corporation (PCEDC, 2022), 75% of PT's land was in farmland in 2022.

CCF is a functional framework with seven capitals (Table 1). I found it most suitable to analyze the dynamic relationships between agricultural production and commercial and residential development. CCF has been used in varied agricultural contexts, including sustainable agriculture (Butler & Flora, 2006; Flora, 1995, 2011; Warren et al., 2001), participatory agroecological and agri-environmental schemes (Arnott et al., 2021; Kansanga et al., 2020), community supported agriculture (Furness et al., 2022), and cooperative models (Hale & Carolan, 2018; Kustepeli et al., 2023; Mohammadi et al., 2022; Tuna & Karantininis, 2021).

Social Capital and Eco-Social Symbiosis

Although I initially considered all seven capitals when framing my research plan and questions, social capital (SC) emerged as the most applicable capital for analyzing the tensions among people in production agriculture and commercial and residential development. SC is at the heart of sustainable community development (Halstead et al., 2022; Mattessich, 2009), and includes social trust, networks, and shared values that people can cultivate and use to improve their livelihoods (Ostrom & Ahn, 2003; Putnam, 1995). SC networks can bond, bridge, or link (Cofré-Bravo et al., 2019), as explored in the following paragraphs.

Bonding SC involves closed, dense networks featuring strong ties within homogenous groups (Putnam, 2000). Relationships between farmers are considered bonding SC and tend to be based on shared experience, idea development, equipment sharing, and high-level knowledge exchange (Cofré-Bravo et al., 2019; Fisher, 2013). Bonding SC has been found to improve farmer well-being (Cavatassi et al., 2012) and shared trust exhibited an important influence on farmers' management decision-making (Fisher, 2013).

Bridging SC has been shown to bolster mutual relationships outside of homogenous groupings (Agnitsch et al., 2006; McDaniel et al., 2021). The formation of interconnected networks of related businesses and organizations ("clusters"), along with the expansion of agriculture-linked industries and increased employment and spending, can strengthen a community's SC (Adhikari et al., 2018). Because SC is a private and public good (Ibrahim et al., 2017), it serves as a conduit for communal activities (Future Farmers of America [FFA], county fairs, farmers markets) that bridge the divide between nonfarmers and farmers; for example, when nonfarmers reported positive direct relationships with farmers, their support for agriculture was stronger (Sharp & Smith, 2003). Of course, the strength of bridging SC depends on occupation type (Gómez-Limón et al., 2014).

Table 1. Definitions of Community Capitals

Capital	Definition
Natural	Resources such as air, land, water, minerals, oil, and the overall stability of ecosystems. Forms the basis for all other capitals.
Cultural	Language, symbols, mannerisms, attitudes, competencies, and orientations of local community members and groups.
Human	Knowledge, skills, health, and physical ability of community members.
Social	Social networks, associations, and the trust they generate among groups and individuals within the community.
Political	The ability to engage external entities in efforts to achieve goals and the ability and power to access and influence the distribution of resources.
Financial	Available financial savings, income, investments, and credit at the community-level that is instantly accessible.
Built	Buildings and infrastructure systems within a community.

Source: Flora et al., 2016, p. 13.

Among farmers, bridging SC helps them gain new kinds of information, build social cohesion, and engage in collective action (Fisher, 2013).

Linking SC refers to ties between individuals and groups in hierarchical relationships (Johnston & Mellor, 1961; Woolcock, 2001). The PT farm-land-development situation is embedded in and heavily influenced by the global agri-food system (Carolan, 2022), federal commodity subsidy programs (Bruckner, 2016), and crop insurance policies, all of which reward shape farming by rewarding productivity maximization (Yu et al., 2018).

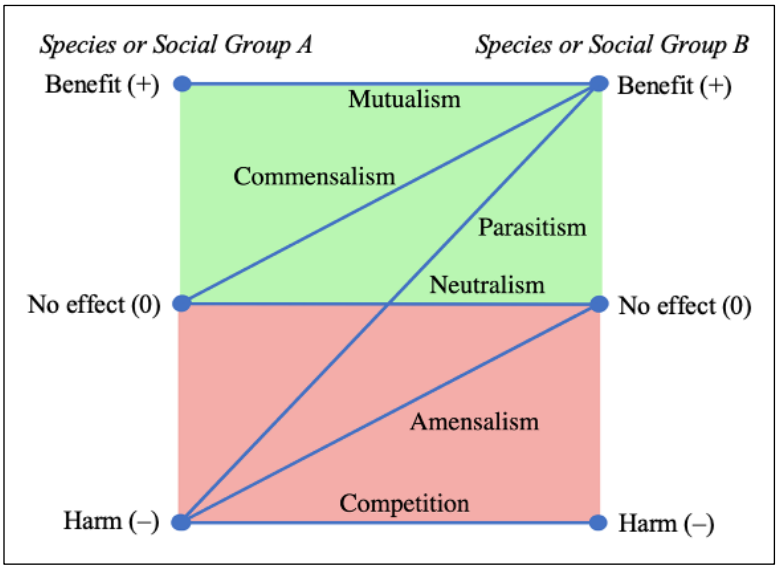
To best conceptualize the mechanisms that form SC in the context of natural agroecosystems, I incorporated the concept of 'eco-social symbiosis' to better understand the eco-social dynamics occurring between and within human networks and natural ecologies (Bao, 2023; Walton et al., 2024). Symbiosis originally referred to the long-term relationships between different species (Margulis & Lovelock, 1981), "is unavoidably cross-disciplinary" (Peacock, 2011, p. 224), and has been used to analyze relationships within species networks. Scholars have integrated SC frameworks with evolutionary theory to explore the complex inter- and intra-actions of matter, culture, and sociality (Hird, 2010). For instance, there have been at least 16 socio-ecological sustainability frameworks integrated with CCF (Panzarella et al., 2023), and scholars have called for more studies on socio-ecological ethics and policies (Elsen, 2018; Hirvilammi & Helne, 2014; Quilley, 2009). The six-pronged eco-social symbiosis spectrum ranges from mutualism to competition (Figure 1).

Background

Pottawatomie County (PT) is located northeastern Kansas and features native prairie and Flint Hills, products of the late Pleistocene. The Tuttle Creek reservoir forms its Western border while the Kansas River and Interstate 24 shape its southern border. Since early European settlement, alterations in the agrarian landscape have influenced transitions in the region's political economy (Middendorf et al., 2008). According to the KU Institute for Policy & Social Research (2023), in 2023, 26,382 people resided in PT, its largest recorded population. Compared to 2023 population trends for the other 104 Kansas counties, PT had the steepest annual increase at +17.3% (Self, 2023). Sanderson (2019) projected it to grow 59.2% by 2044. Most growth in PT occurred along the southern border. In 2011, 70.80% of PT residents lived in the four most populous townships—Blue, Wamego, Saint George, and Saint Mary's (U.S. Census Bureau, 2023)—but by 2023, 74.98% did (Table A1). When performing this study, I had lived in PT for two-thirds of my life and knew people practicing commodity and specialty agriculture.

For PT's rural residents and farmers,[1] the changes brought by population growth were simultaneously exciting and threatening. Growth brought new talents, ideas, economic opportunities, and ways of being, but "the influx of people and businesses [could] alter the style and pace of

Figure 1. Eco-social Symbiotic Relationship Spectrum



Source: Alexander, 2018; shared under CC-BY 4.0 license.

[1] I used "farmer/farming" terminology—rather than USDA's terminology of 'producer' or 'operator'—to convey the entangled identity and culture of the farm occupation and not limit farmers to the products they produce (Vayro et al., 2020).

life that originally made these areas appealing" (Brown & Swanson, 2003, p. 31). Growth in population accompanied growth in the annual earnings of nonfarmer residents, allowing them to offer higher bids for land.

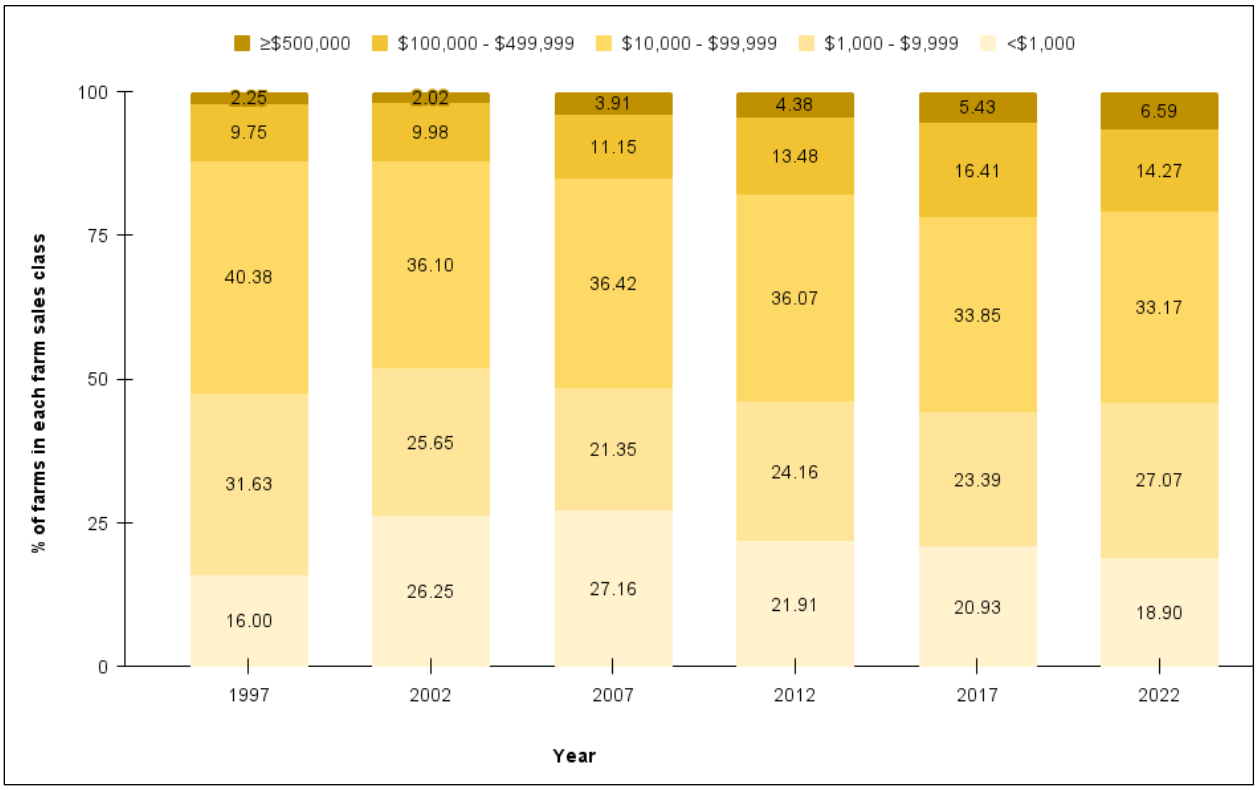
The PT Board of County Commissioners recognized and addressed these tensions in 2019 when they adopted Kendig Keast Collaborative's "Plan Pottawatomie County 2040," the county's first strategic plan since 1994. While its language was generally supportive of farmland preservation, the plan offered "potential revisions" to one of PT's zoning laws, the quarter-quarter rule. Moreover, the local newspaper asked 2024 county commission candidates, "What are your plans for preserving farm ground while also creating development opportunities and jobs throughout the county?" (Goodman, 2024).

I identified two potential reasons for the mounting tensions between stakeholder groups, which together provided an important background for understanding the situation in PT. First, larger socio-economic forces pressured primary-occupation farmers to expand their scale and intensify their production. Second, the Board of County Commissioners redistricted and added two commission seats in 2024, a change that effectively reduced farmers' representative power.

Gross Product Sales Concentration

While most PT residents experienced improved well-being, most PT farmers did not. From 1997 to 2022, the average inflation-adjusted sales per operation increased by $76,091.43.[2] However, much of that increase was in the largest farms. The rate of farms in the ≥$100,000 sales class range captured 20.86% of total market sales in 2022, up from 12.0% in 1997 (Figure 2). In terms of inflation-

Figure 2. Distribution of Pottawatomie County, Kansas, Farms by Sales Class, 1997–2022



Note: All currency is US$.
Data sources: USDA NASS, 1999, 2004, 2009, 2014, 2019, 2024.

[2] All currency in this article is in US$.

adjusted annual farm market sales as a percentage of total operations with sales, in 2022, the top market sales class of ≥$500,000 captured 75.61%, compared to 62.07% in 1997 (Figure 3). In other words, in 2022, just 54 of PT's 820 total producers (6.59%) captured more than three-quarters of all product sales.

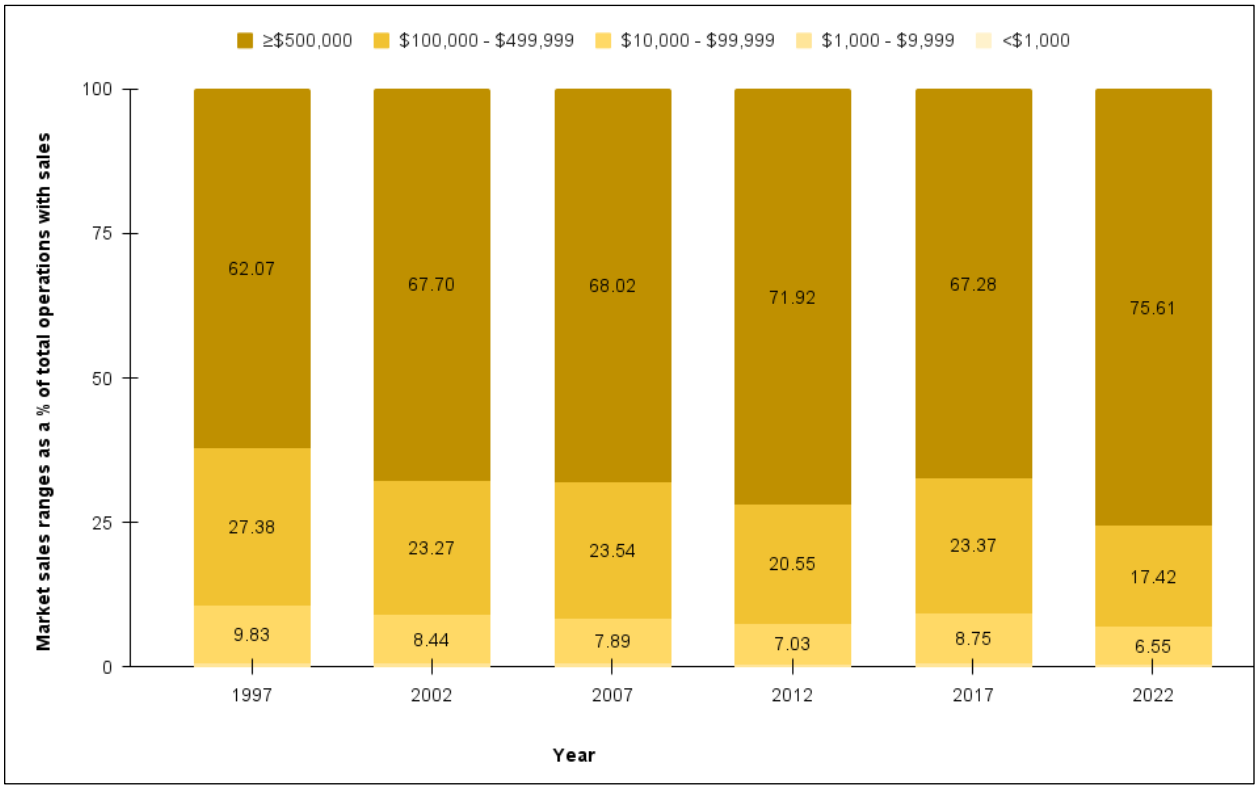
These trends were most likely driven by the larger socio-cultural conditions of both low per-unit returns and higher per-unit production costs. Low per-unit returns stemmed from overproduction and low prices, while higher per-unit production costs resulted from larger operators who received cheaper per-unit prices for many inputs (bulk orders), spread fixed equipment costs over larger acreages, and had higher labor efficiency (Cochrane, 1993; Duffy, 2009). These conditions may have pressured farmers to expand and/or intensify their operations (Crowley & Stainback, 2019; Farm Action, 2024).

Redistricting and County Commission Board Expansion

Kansas farmers have long been concerned about how non-farm development both threatens access to large enough tracts of contiguous farmland for efficient operations and increases the risks that those operations will cause conflicts with non-farming neighbors. Historically, state policies have ameliorated such concerns. Kansas was the first state to pass a 'right to farm' law in 1963, with the purpose "to provide agricultural activities conducted on farmland protection from nuisance lawsuits" (National Agricultural Law Center, 2022, p. 2; Kansas Protection of Farmland and Agricultural Activities, 1982/2024).

At the county level, the PT Board of County Commissioners can limit activities on the land and the sale of property for non-agricultural uses. PT has historically used the 'quarter-quarter rule' to preserve farmland from large residential developments by requiring new houses be sited in wooded

Figure 3. Distribution of Pottawatomie County, Kansas, Farm Sales Ranges by Operations with Sales (Inflation-Adjusted May 2024), 1997–2022



Data sources: USDA NASS, 1999, 2004, 2009, 2014, 2019, 2024.

areas or on less productive soils (though this rule could be revisited or amended). Articulated in the PT Office of Planning and Development's (2023) unified development plan, the quarter-quarter rule promotes "productive agricultural land" preservation and seeks to "lessen the conflict between urban development and agriculture."

While these longstanding policies have been advantageous for stakeholders with interests in farming, a 2022 resolution weakened their advantage. On December 12, 2022, PT's Board of County Commissioners (2022) passed Resolution No. 2022-70, which added two more county districts and commissioners to better reflect PT's changing population dynamics. The five-commission district map went into effect in November 2024. The 2024 redistricting and addition of two commission seats reduced the long-term representative power of farmers and farming stakeholders. It divided the county so that the six townships of Blue, St. George, Louisville, Wamego, Belvue, and St. Mary's—which collectively housed 80.1% of PT's total 2022 population—became represented by four district commissioners. The 17 remaining, northernmost townships—which made up 75% of the county's land mass but only 19.9% of the 2022 population—became solely represented by District 5, which contains a much larger share of farmland than the other four districts combined.

By adding two commissioners and realigning districts with township population trends, PT gave the average resident both more representation and more accurate representation. Because people rely on political connections with their commissioner to mobilize resources to augment their community's political capital (Flora, 2004), two more connections likely increased resource mobilization. At the same time, however, adding two new commissioners reduced the voting power of the District 5 commissioner from 1/3 to 1/5, a 40% decrease. Compared to pre-2024, redistricting gave greater representative power to people in exurban and suburban places than those living on the lion's share of PT farmland.

Given that representative shift, the strategic plan language suggesting quarter-quarter rule revisions, and the fact that 75% of PT's land was already in farmland (PCEDC, 2022), the county commission became less politically compelled to support policies favoring farmland preservation over development.

Methods

The methods used included participant interviews and a farmer survey, followed by a reflexive thematic analysis of those coded interviews.

Participant Interviews and Farmer Survey

Following institutional IRB procedures, I conducted semi-structured interviews with 22 PT participants from December 20, 2023, to May 19, 2024. My purpose was to understand how stakeholders with interests in farming and stakeholders with interests in development perceived and experienced the symbiotic relationships among them.

I used purposeful sampling (Campbell et al., 2020; Palinkas et al., 2015) and snowball sampling, whereby I asked participants to recommend others who might be willing to participate. Of the 22 interviewees, 14 were aware of my existence prior to initial contact. I sought potential participants who did not know who I was, but to little avail given timing issues or lack of interest in this project on their part. This made it difficult to gain perspectives outside of this networked sample and resulted in "inconvenience sampling" (Duneier, 2011, p. 9), which created the potential for bias, but also revealed social network patterns among participants (Noy, 2008).

My interviewees consisted of four nonfarmers and 18 farmers, 10 of whom also held leadership positions in agricultural and/or community organizations. Interviewees worked for a USDA conservation service office, county soil health agency, coop board, bank, feedlot, ag-tech company, agri-input company, and/or were members of the Farm Bureau, the National Farmers Union, churches, FFA, school boards, ad hoc community committees, and so forth.

A farmer's management practices can be influenced by the morals and mores of the groups to which they belong, including in Facebook groups, in coffee shops, on church committees, or at sporting events. The SC interview guide, adapted from Arnott et al. (2021), included the following ques-

tions: Which groups do you belong to? How often do you engage in them? With which groups are you most likely to discuss best farm management types and which groups do you learn from the most? With which groups do you most regularly share knowledge and resources? How do you perceive increased development in the county? How does it affect your operation and livelihood? How would you describe your relationships with other, similar farmers; do they tend to be more cooperative or competitive?

Of those 18 farmers, 16 responded to a short survey asking for basic information on their farm typology and characteristics. Among those, the average farm size was 1,182.75 acres (of which 435.4 were owned and 749.4 rented), which was 689.72 acres larger than PT's 2022 average farm size of 493.03 acres. Because I did not inquire about gross sales, I considered 'smaller' farms to be ≤493 acres and 'larger' farms to be >493 acres. On average, interviews lasted nearly two hours, and I talked 26% of the time versus 74% for interviewees, a 3:1 ratio. Participants were all non-Hispanic white and 72.3% male, with an average age of 55 years old and a range of 26 to 71.

Eight of those 16 farmers agreed that they would "be able to make it financially without farming," a secondary-occupation proxy. Countywide, the percent of primary-occupation farmers linearly declined (linear $r^2 = 0.462$) since 1997 (Figure 4), reaching 39.14% in 2022.

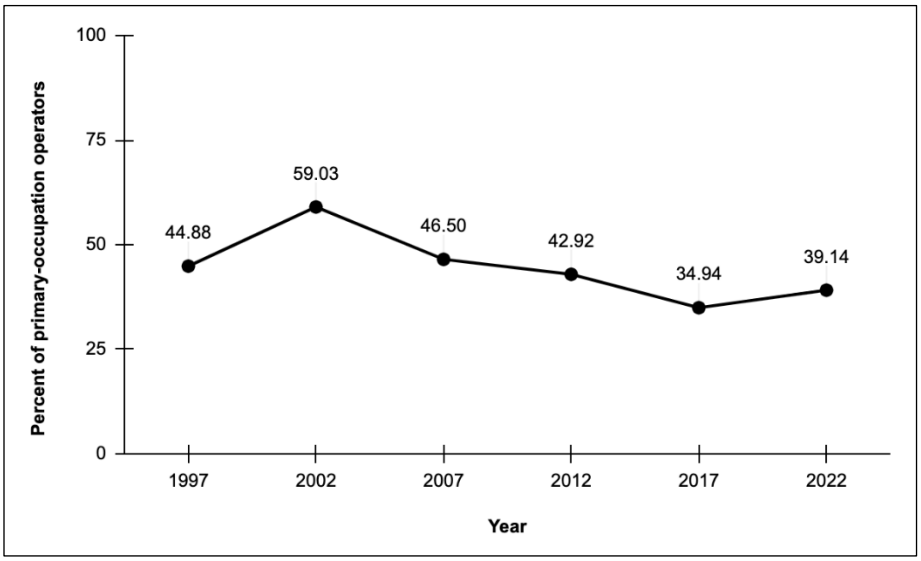
The average farm size of the eight interviewed primary-occupation farmers was 1,526 acres (29.02% larger than the interviewed sample average and 209.52% larger than the county average), illustrating the extent to which primary-occupation farmers were reliant on large acreages to make a living. This was intuitive. Principal operators self-report whether farming is their primary occupation (U.S. Department of Agriculture, Economic Research Service [USDA ERS], 2025), and if it is, then they are typically more dependent upon farm income—derived from larger acreages—for their livelihood than secondary-occupation farmers (Daloğlu et al., 2014).

Reflexive Thematic Analysis

I used My Voice Recorder to record, Otter.ai to transcribe, and Atlas.ti to store and code transcripts. To ensure that respondents remained anonymous, I assigned pseudonyms. I thematically analyzed qualitative portions of the interviews by following Braun and Clarke's (2006) six steps of reflexive thematic analysis: become familiar with the data, generate initial codes, search for emergent themes, review themes, define them, and name them.

Because coding was performed at the paragraph level, most paragraphs included more than one code. So, to get a better idea of how much aggregated time was spent discussing topics central to each capital, I meta-coded each paragraph. Meta codes provided a more holistic understanding of which capitals were most emphasized during over-

Figure 4. Percent of Pottawatomie County, Kansas, Primary-Occupation Operators, 1997–2022



Data sources: USDA NASS, 1999, 2004, 2009, 2014, 2019, 2024.

all conversations. I gave a paragraph one meta code if more than 50% of the paragraph's codes belonged to the same capital, or if there were two or more codes belonging to the same capital.

Findings

I analyzed interviewees' eco-social symbiotic experiences, followed by how those experiences shaped their social capital perceptions of the stakeholder groups.

Symbiotic Relationships Between Farming and Development

In its reports, the PCEDC has emphasized agriculture's myriad economic benefits (PCEDC 2022, 2023b) and couched development as a 'win-win' for all residents (see Giridharadas, 2019). That there were 150 more total producers in 2022 than in 2017 might serve as evidence for the mutualistic argument that the county has equally supported both stakeholder groups. But consider, as farmer and community leader Camden did, the scale at which those emerging producers operated:

> The increase in new farmers includes a lot of the more 'urban type' of farmers who may have a farm service agency account, but they might have a two-acre property, and they're going to install a high tunnel and do cut flowers or vegetables for the farmer's market. If anything, I'd say that farming operations are consolidating, they're clumping.

Under the USDA system, an operation with just over one-third of an acre of vegetables or five horses or ponies qualifies as a "point farm" worth at least $1,000 (O'Donoghue et al., 2009). Even though the number of PT producers increased, the total cropland acres has linearly declined since 1997 (Figure 5).

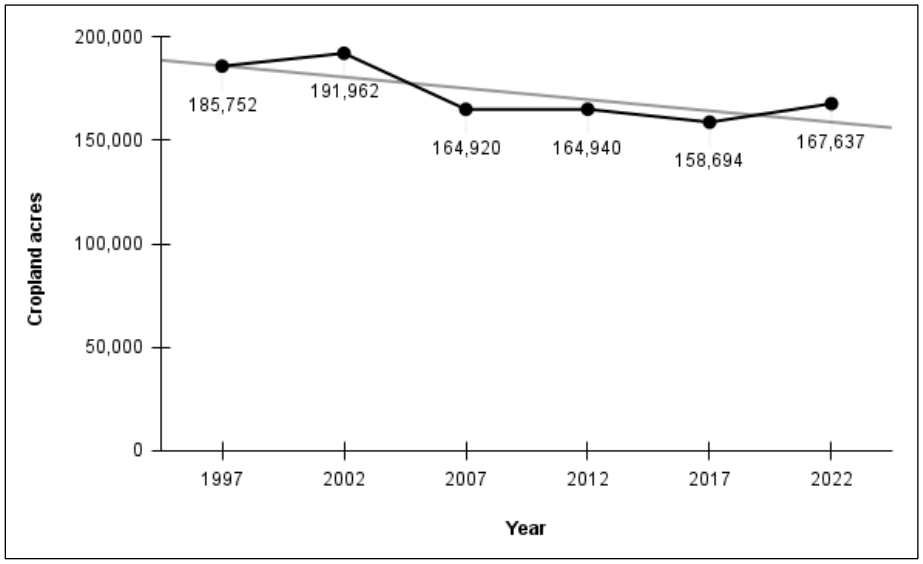
Primary-occupation farmers with larger-than-average operations stressed the necessity of consistently expanding their acreage to survive. Pete, a primary-occupation farmer with an operation much larger than the PT average, stated:

> There are no small farmers anymore, there's just no way for them to exist. … You got to constantly expand. They've told us that at K-State for the last 20 years, "If you don't double in size every five years, you're not going to be here much longer."

Pete elaborated that farmers with larger operations have the necessary capital to compete with private land sales, mostly from wealthier nonfarming families wanting to live a rural lifestyle:

> People are moving out of the city, coming here and buying the land. … We have more people around here, though they're not buying a huge amount of lots and then building a whole bunch of houses out here yet. But we're going to run out of land out here, and they're just gonna keep finding more land. Especially for the small-town farmer, it's hard to say 'no' with

Figure 5. Total Cropland Acres in Pottawatomie County, Kansas, 1997–2022



Data sources: USDA NASS, 1999, 2004, 2009, 2014, 2019, 2024.

> that amount of money on the line, especially now that all these small-time farmers are usually older farmers. If they have no one else in their who family wants a farm, why keep doing it? It's a lot of work, and when you're getting up there in age, you sometimes don't want to have to deal with farming.

There are several reasons why a farmer with a smaller operation might sell parcels to a nonfarmer, including retirement. Retiring farmers typically value family succession first, turning to leasing or selling as secondary options (Grubbström & Eriksson, 2018). The annual payments for mortgages on farmland may well exceed the returns, especially when land prices are high and returns on farming are low. Having larger operations allows the owner's farm debt payments to be distributed over larger acreages in production, especially if they own much of the land without debt. Mostly due to the widespread financialization of farmland (Gunnoe, 2014), owners of larger operations are better suited to take on more land—for example, Weber & Key (2014) found that farmers who incurred larger wealth gains from land appreciation bought more land than they would have otherwise compared to farmers with smaller gains.

Primary-occupation farmers were skeptical that commercial and residential development was the rising tide to lift all boats. Zach, a primary-occupation farmer whose operation was larger than the average county farm size in 2022, described a parasitic relationship:

> Agriculture can't compete with residential or commercial development, especially in the fastest growing county in the state. That's right in our back door. That's how it is, but probably not how it should be. Where the Scorpion project is going in, man, that was a prime 80-acre field. Maybe I wasn't on any kind of a list to rent or buy it in the future, but I could have been, so that affects me. Residential development can pay roughly three to four times the amount per acre that I can, so I'm basically doing whatever I can with politics to try to prevent more of it and just holding on to what I have. … The people who are doing the agriculture are not getting compensated enough for what they do, relative to the people who are reaping the benefits. And therefore, we're not competitive in the land market. And so, it's the demise of agriculture. If it was truly a free market, we would be adequately compensated for what we're doing. But the fact that agriculture is not competitive with other industries, that raises a red flag, doesn't it? At some point, it's going to, because people need to eat and if we don't have any land to raise food, then that at some point that will be an issue. … I don't see it turning around.

Nick, another primary-occupation farmer whose operation was larger than the county average, was concerned for the future of cropland farming given developmental pressures and the cultural transmission of values from those who come to own the land:

> Who cares what you were going to do with [the land], they'll pay more for it. I see that [sentiment] a lot out here, and it's getting closer to us. The money is the end all be all. But, if everybody built a house on five acres, what's left? That may be not in my lifetime, but I have grandkids, and it could be during their lifetimes. The land is getting passed on to people who don't have the same values, which is why we're having the housing development pressures. It's expensive to buy land around here because developers can obviously make it happen easier than I can. And it's tough because there's not enough responsibility or selflessness out there to question those younger people making the decisions. If you're in a subdivision deed and need five acres, why do you need to go spend thousands on a lawn mower so you can mow two hours once a week?

A central issue most interviewed, primary-occupation farmers had was not with population growth per se, but with nonfarmers buying more acres of former contiguous farmland than primary-occupation farmers deemed necessary. Earl, a primary-occupation farmer, called for sustainable development to reduce pressure on

the county's limited stretches of contiguous farmland:

> We'd be better served if the housing was more concentrated because you got to keep farms around, or eventually you're gonna get more competition between farmers. There's X amount of farm ground, and it's dwindling with the new houses and a little bit getting sold off here and there. It's not like the plumbing shop, where the town is growing and they're adding customers, so they're not necessarily stealing somebody else's customers. There's just a finite amount of land.

Farmers typically rely on stretches of contiguous farmland to yield enough to pay their operating notes. However, development can make farmland increasingly fragmented and unaffordable for farmers. When farmland parcels are sold to residential developers, farmers can come to operate smaller, oddly shaped plots of land; especially for farmers who own large equipment, this way of farming can be inefficient and challenging. Farming parcels of land that are long distances apart (even if all those parcels are rectangular and good-sized) can lead to inefficiencies and increased costs (Aslam & Fazal, 2025).

Secondary-occupation farmers mostly expressed relationships that ranged from commensalism to mutualism. Michael, a community leader and secondary-occupation farmer of a handful of acres, said there was a need to balance farming and sustainable development:

> It's a balancing act. I mean, it's progress. It's new money. It's great for the community, but I don't know about agriculture. … When farm ground comes available [to buy], it's mostly grassland north of St. Mary's where they're developing and building homes.

Nathan, a secondary-occupation organic farmer and community leader, said he hoped that several younger families interested in smaller-scale, subsistence, and specialty food production could pool their assets to make farmland purchases to then equally divide among them. In other words, the 'get big or get out' dictum need not be the default for successive generation's "future imaginaries" (Bazzani, 2023). Nathan imagined a more mutual model:

> Four cooperating families could do a good job farming these 400 acres, [and] they would probably have an opportunity to buy more than that. There are a lot of older people whose kids left for professional careers, and they don't need to sell the farm for money. They don't want to see it sold or have the uniqueness of that place obliterated, like bulldozing buildings and trees just for it to become a large tract of corn or soybeans. There are younger people who can look to develop that alternative land ownership model to the farmers who spent their lives assuming that they needed [their farms] to be large scale, and I think that was a mistake. They should be smaller scale and replicated.

Pete, a primary-occupation farmer with a larger-than-average operation, recalled the weekly in-person social events that used to take place in Westmoreland and Blaine in the 1940s and '50s:

> Social structure was so different back then. Saturday nights were the big thing—all these people would come in. Some would live as far as five or six miles out, but they got their horse and wagon and came into Blaine on Saturday night with some chickens, eggs, cream, or whatever they had to trade. And those vendors would be open on Saturday night in Blaine, and we had stores like the general store, the lumberyard, and two banks. There were several hundred people involved.

Due to decades of policies, social mores, and industrial capitalist penetration into agricultural ways of being (linking SC), farmers have felt pressured to expand and/or intensify commodity production to survive (Lobao & Meyer, 2001; Lobao & Stofferahn, 2008; Magdoff et al., 2000), and to compete with the higher land bids that developers typically offer.

Compounding farming and development

stakeholder tensions were PT's relatively low mill levy rates (tax rates applied to a property's assessed value to determine the amount of property tax owed), which attracted developers. In 2023, all Kansas counties had an average of $133,046 on each $1,000 valuation. In comparison, PT's average property levies of $96,885 were the second lowest, behind only Coffey County (Kansas Department of Revenue, 2021). Even so, in September 2024, PT lowered property taxes by 9.9% (Parker, 2024), meaning that PT residents saw a 2.856 mill levy decrease in the 2025 general fund (Wolfe, 2024).

Some farmers were frustrated by the extent to which they subsidized exurban and suburban development. For instance, Sam, a primary-occupation farmer, wanted to make non-agricultural-use properties pay more in property taxes:

> I tried to talk to our county commissioners about Pottawatomie adopting a different tax mill levy for lands not used for agriculture.

Sam's request was not unrealistic, given there was already a wide discrepancy between average urban (129.213) and rural (88.915) county-wide mill levy rates (Kansas Department of Revenue, 2021). Moreover, some PT townships had much lower-than-average rates than others; for example, certain 2021 tax codes for St. Mary's and Belvue Townships posted sub-80 rates.

Historically, farm, ranch, and forest landowners have paid far more for government services than they have received. American Farmland Trust's (AFT) 2002 meta-analysis of 83 'cost of community services' studies in 19 states found that those landowners paid more than they received in public services, with a median cost of community services, per dollar of revenue raised, of $0.36 per tax dollar versus $1.15 for residential (Freedgood et al., 2002). Moreover, AFT's 2005 analysis of 18,261 acres of farm, forest, and open land found that their landowners created an average surplus of $8.03 per acre for town services.

Property tax assessments can be great unifiers or dividers. For PT residents, especially those residing in the more remote rural townships, lower property taxes resulted in fewer county resources and their equitable deployment. For instance, when I spoke with Sam, he was frustrated that not enough county snowplows were deployed to the more remote rural pockets. He had just spent much of the week using his own tractor, diesel fuel, and time "plowing snow off county roads" and towing snowdrift-stuck vehicles so that his neighbors could access essential services from Blue Township. Indeed, the degree of social and political capital accrual can depend on the degree of township rurality (McCall et al., 2021). If rural PT township leaders increased their mill levy rates for nonfarm properties, they could perhaps influence county commissioners to do the same, disincentivizing nonfarmer purchases of previously contiguous farmland. If this change ever occurs, primary-occupation farmers may come to view their relationships with nonfarm stakeholders as less parasitic.

In sum, interviewed, primary-occupation farmers primarily couched agriculture versus development in competitive (lose-lose) and parasitic terms (win-lose), whereas secondary occupation producers and community leaders perceived relationships ranging from commensalism to mutualism. As I explored in the next subsection, interviewed primary-occupation farmers' competitive and/or parasitic perceptions of, and relationships with, nonfarmers and developers also typified their relationships with other primary-occupation farmers in their social networks.

Competitive Primary-Occupation Farmer Social Networks

Primary-occupation PT farmers reported (in interviews) deriving their success from 'winning' land from other farmers. Raymond, a primary-occupation farmer of an operation much larger than the county average, used the phrase "vulture culture" to describe his perception of, and nature of engagement in, competitive conventional agriculture social networks:

> I've seen where a farmer dies, and the family get tons of phone calls the next day before the funeral. I've never done it before, but they'll beat on the door to ask to farm the ground—it's the vulture culture. … I've never cut anybody's throat, but that's the culture of every-

> body around here. To be successful, to a certain degree you have to learn how to manipulate or cut someone else out, like a small producer. That's the problem with agriculture now, you do anything and everything to get ahead. Like say some [farmer] neighbor is going to retire; you have to make relations with that person before they retire, and even then, you still might only have a 50/50 chance to get their land. Even though you've helped that neighbor, a whole other third party might come in and get it. There are a lot of mind games. There is a lot more to farming than just 'go farm ground.'

Of course, local agriculture is affected by the larger social context of political polarization and media factions (Archer et al., 2008), and aggressiveness may influence financial success and social status.

When families go through farm transitions, they usually sell or lease, and each option has its own considerations, advantages, and disadvantages (Moore, 2025). Family farm ownership engenders socio-ecological resilience (Darnhofer et al., 2016), but in cases where there is not a clear family farm transition in place, competition heightens for owned or rented ground. A farmer operating more land would likely be able to offer or pay higher rent prices, at least in the short term, than would a farmer of a smaller operation. There were, of course, renter-lessee relationships in PT characterized by commensalism (0, +) or mutualism (+, +). However, the primary-occupation farmers of larger operations couched their relationships toward other primary-occupation farmers as competitive, meaning that there was negative harm for both social groups. However, there were times when their espoused relationships with other farmers were more parasitic (+, –) than competitive (–, –); i.e., they perceived owning or renting more land as benefitting them while doing financial and social harm to other farmers who also wanted the land but lost out.

Competitive, parasitic, and cooperative aspects to farming have always existed, but how did they change in rate and extent over time? The consensus among interviewees was that social symbiotic relationships surrounding land transition have emerged as increasingly competitive since the 1980s farm crisis (Meyer & Lobao, 2003). Development was a reason for increased competition, but certainly not the only reason. Earl farmed before the farm crisis, and experienced farmer competition grow fiercer since, especially when it came to renting farmland. He told a story of his time in seed sales to exemplify the competitive tensions that have persisted among those in his social networks:

> I don't think farming is cooperative anywhere [in the county]. Here's an example. When I was selling seed, the district rep came around, and we had a couple of dinners together. All my customers came in, we fed them and went through different plots. The rep down on the east side of Wamego had several big customers, but he took each one of his clients out separately, because none of them could get along because they had all poached ground from each other. It was so competitive, and people just did not like each other.

Vanessa, a secondary-occupation organic farmer with an operation size near the county average, did not want to be around the aggressive self-interest that she viewed as permeating the social engagements of conventional farmers. So, she pursued networks with other organic farmers:

> Conventional farmers are far too interested in, 'what's in it for me?' It's a narrow, short-term interest. … I think a lot of it is peer pressure—'what are your neighbors doing?' … We've done it differently than the big industrial approach to agriculture, the 'I'm going to buy out my neighbor and lease ground out from under you' mentality. I was going to do it differently, so I had to find people. Not in the county, because there's just a few organic farmers in the northern part, but I fled to find those people who were going to farm the way I wanted to farm.

Vanessa argued that farmers in alternative agriculture networks (such as organic or regenerative)

were keener to share knowledge and help neighbors due to their transformed worldview, a finding revealed elsewhere (Ohlson, 2014; Page & Witt, 2022; Snorek et al., 2024).

Adam, a primary-occupation farmer who rented an amount of farmland smaller than the county average, believed farming did not used to be so competitive, and wished neighboring farmers could return their more mutualistic roots:

> I felt like our area was a community 30 years ago. We went away from that type of culture, and it has become more selfish. It is sad to say, but I think everybody's in it for themselves. I don't like that. I feel like we can get kind of back to something like that culture, where it feels almost like a second family where if you ever need any help, don't be afraid to call. I saw that a lot growing up. If someone called you for help, you would say, 'yeah, I'll be right there.' And I want to get back to that.

Cameron, a conservationist and secondary-occupation farmer of just a few acres, also argued that farmers should not view their successes as competitively derived:

> Success is not a pie. Your success does not have to take away from mine or be deleterious toward me.

While Adam and Cameron espoused commensalism and emphasized the importance of cooperative farmer-to-farmer relationships, most primary-occupation farmers perceived success as a limited 'pie.' They stated or implied that they defined 'success' by their ability to acquire more affordable land or maximize yield per acre, a common way that conventional agriculture has measured success (Stone, 2022). For a few interviewees, success was not a 'pie' because they expanded their boundary of consideration beyond yield to encompass the larger goals of operation solvency (e.g., net income maximization) and community coherence.

Discussion and Conclusion

I analyzed how PT farmers, farm experts, and community leaders perceived and experienced eco-social symbiotic relationships between and among stakeholders with interests in farming and stakeholders with interests in development. This study was the first using eco-social symbiosis in tandem with social capital. By uniting Flora et al.'s (2016) CCF conceptualization of SC with the eco-social symbiosis spectrum concept, I showed how within-county forces helped to create the social conditions for rising tensions between these stakeholder groups. Due to larger, systemic socio-economic factors driving concentrated farm sales ('linking' SC), primary-occupation farmers felt pressured to expand or intensify production. Moreover, the board of county commissioners' 2024 decision to redistrict and add two commission seats shifted more representative power from farmers to nonfarmers.

Performing a thematic analysis of participant interviews ($N = 22$) allowed me to reveal the ways in which county development influenced how interviewed, primary-occupation farmers of larger operations perceived their relationships with development stakeholders as parasitic, and with other primary-occupation farmers as competitive, in turn undermining their bonding and bridging SC. Interviewed, primary-occupation farmers felt the pressure to intensify and/or expand production because they could not compete with the prices offered for land by commercial or residential developers and in-migrating millionaires "who [could] buy 80 acres and build a house" (Nick). The proportion of farmers whose primary occupation is farming may shrink as a result of pressures from population growth and development (that are unlikely to abate), and may also increase the scale of surviving farms owned by primary-occupation farmers. Conversely, interviewed, secondary-occupation farmers and community leaders espoused commensalism and mutualism with developers and other farmers.

For struggling commodity farmers wanting to transition to more alternative principles and practices requiring fewer acres, there are several 'how-to' guides (Butterfield et al., 2019; Masters, 2019; Perkins, 2019). PT has lacked sufficient infrastructure for processing, storing, and selling locally grown, specialty produce outside of the growing season. Recognizing this issue, the board of county

commissioners adopted a strategic plan in 2019 (Kendig Keast Collaborative, 2019) that included language calling for greater investment in aggregation spaces, cold refrigeration, local purchasing initiatives, and specialty markets (Ray & Schaffer, 2008).

Together, these efforts may help improve social capital stocks among stakeholders in agriculture and development and enhance the flourishing of all people who call Pottawatomie County home.

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Appendix. Supplementary Findings and Discussion

According to the Pottawatomie County Economic Development Corporation (PCEDC, 2023a), Pottawatomie County's (PT's) surrounding regional economy was more than 50% dependent on facilities and resources provided by federal government expenditures, especially Fort Riley and Kansas State University (KSU). Located at the Western edge of the Kansas-Missouri "animal health corridor" is the USDA's National Bio and Agro-Defense Facility (NBAF), the first USA facility with level-4 containment space to study zoonotic diseases affecting large livestock (USDA NBAF Office of Communications, 2023a, 2023b). Largely due to NBAF's presence, in April 2022, the City of Manhattan, State of Kansas, PT, KSU, and the Manhattan Area Chamber of Commerce passed an economic development package to fund construction of the $650 million Scorpion Biological Services facility in Blue Township, within the City of Manhattan's (2025) proposed East Manhattan Gateway Area (Figure A1). Verdict Media Limited (2022) projected that Scorpion would add 500 well-paying jobs to the area from 2022-2029.

In part thanks to PT's rapid population and economic growth, nearly every human well-being measure increased since 1997 (Table A1).[3] In 2023 Pottawatomie County ranked as the second healthiest of all 105 counties (CHR&R, 2023). Population increases have concentrated in the Blue (District 1) and Saint George (District 4) townships (Table A2).

Table A1. Human Well-being Variables, Percent Change (%Δ), 2010–2024

Variable	% Δ[a]	Years[b]	Linear r^2
Low birthweight[1]	-21.21	2010-2024	0.235
Poor or fair health[2]	13.16	2010-2024	0.437
Adult obesity[2]	32.97	2010-2024	0.572
Uninsured[3]	-30.58	2010-2024	0.346
Unemployed[4]	-24.38	2010-2024	0.257
Child poverty[5, 6]	-25.45	2010-2024	0.301
High school graduation, including equivalency[5]	-12.42	2015-2022	0.811
Some college (no degree) or associate's degree[5]	-2.96	2015-2022	0.578
Bachelor's degree or higher[5]	16.38	2015-2022	0.871
Graduate or professional degree[5]	24.56	2015-2022	0.798
Median household income (June 2024 inflation-adjusted)[5, 6]	9.48	2010-2024	0.590
Population[6]	22.12	2010-2023	0.695

[a] For variables 'low birthweight' through 'child poverty,' negative %Δ indicate improved well-being. Conversely, for variables 'HS graduation' through 'median household income,' negative %Δ indicate worsened well-being.
[b] Using the Community Health Rankings and Roadmaps datasets, I compiled all available data within these ranges. Using the coefficient of determination for the linear regressions (r^2) – a goodness-of-fit indicator – I assessed variance across ranges.
Data sources: [1] National Center for Health Statistics' National Vital Statistics System – Natality Files; [2] Center for Disease Control's Behavioral Risk Factor Surveillance System; [3] Small Area Health Insurance Estimates; [4] U.S. Department of Labor's Bureau of Labor Statistics; [5] U.S. Census Bureau's Small Area Income and Poverty Estimates; and [6] U.S. Census Bureau's American Community Survey Five-Year Estimates.

[3] These metrics did not show wealth distributions or any changes in the gaps between the poorest and wealthiest residents.

Table A2. Township Populations as a Percent of Pottawatomie County, Kansas's, Total Population,[a] 2010–2023

Township [b]	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Wamego [2]	24.39	24.61	24.45	24.39	24.25	24.16	24.13	24.01	23.88	23.81	22.37	22.55	22.35	22.19
Blue [1]	14.20	13.76	14.00	14.15	14.23	14.30	14.34	15.11	15.18	15.23	19.43	19.07	19.33	19.55
Saint George [4]	15.91	15.75	15.89	15.95	16.13	16.38	16.50	16.82	17.15	17.34	17.73	17.82	17.96	18.11
Saint Mary's [3]	16.92	16.68	16.74	16.69	16.59	16.51	16.33	16.09	15.93	15.78	15.12	15.38	15.26	15.13
Louisville [3]	3.74	3.93	3.82	3.84	3.52	3.74	4.63	4.49	4.86	5.27	3.96	3.69	4.04	3.89
Mill Creek [5]	4.71	5.26	4.99	4.71	5.31	4.88	5.00	5.49	5.04	4.45	3.78	3.75	3.43	3.56
Emmett [5]	1.99	2.66	2.28	2.27	1.62	1.16	1.33	1.39	1.61	1.63	1.78	3.41	3.14	2.99
Rock Creek [5]	3.45	2.74	2.76	2.96	2.78	2.75	2.50	2.26	2.12	2.71	2.73	2.16	2.18	2.27
Pottawatomie [5]	2.80	3.13	3.34	3.78	3.81	3.87	3.83	3.25	3.10	3.06	2.71	2.43	2.13	2.08
Grant [5]	1.25	1.25	1.34	1.26	1.21	1.40	1.47	1.09	1.04	0.96	0.93	0.98	1.40	1.65
Blue Valley [5]	1.60	1.91	1.74	1.78	1.53	1.62	1.50	1.51	1.38	1.59	1.50	1.58	1.36	1.69
Belvue [3]	1.71	1.44	1.56	1.49	1.54	1.82	1.96	2.35	2.70	1.99	1.55	0.99	1.16	0.95
Lone Tree [5]	1.01	1.83	1.48	1.34	1.55	1.46	0.96	0.81	0.81	0.83	0.90	0.71	1.08	1.13
Shannon [5]	1.26	1.10	1.53	1.19	1.37	1.12	1.08	0.89	0.85	0.97	1.01	1.20	1.00	1.13
Union [5]	1.04	0.80	0.98	0.82	0.86	0.94	0.66	0.55	0.76	0.98	0.94	1.38	0.93	0.98
Green [5]	0.86	0.44	0.48	0.64	0.60	0.53	0.79	0.67	0.76	0.81	0.84	0.65	0.93	0.66
Sherman [5]	0.55	0.75	0.46	0.68	0.65	0.68	0.60	0.69	0.36	0.29	0.50	0.63	0.71	0.77
Clear Creek [5]	0.65	0.43	0.49	0.44	0.76	0.89	0.73	0.84	1.02	0.64	0.59	0.45	0.47	0.20
Lincoln [5]	0.55	0.44	0.46	0.43	0.44	0.42	0.44	0.47	0.43	0.47	0.37	0.24	0.36	0.35
Saint Clere [5]	0.34	0.12	0.00	0.00	0.03	0.03	0.07	0.05	0.06	0.04	0.19	0.15	0.13	0.11
Center [5]	0.49	0.35	0.62	0.53	0.70	0.63	0.41	0.38	0.39	0.52	0.54	0.45	0.33	0.38
Vienna [5]	0.40	0.46	0.45	0.53	0.41	0.55	0.61	0.64	0.43	0.42	0.32	0.16	0.16	0.10
Spring Creek [5]	0.18	0.17	0.15	0.13	0.09	0.16	0.13	0.15	0.16	0.22	0.22	0.16	0.15	0.13

Data source: U.S. Census Bureau (2024).

[a] Cells shaded in green indicate the year with the largest % of the total PT population, whereas red shaded cells indicate the year with the smallest %.

[b] County commission Districts 1 through 5.

Blue Township leaders and residents (me included) have long discussed forming their own city but have yet to do so. They should accelerate their timeline, because within the decade, the City of Manhattan, Kansas (2025) will attempt to annex Blue Township, largely because its residents have received several city services but do not pay city taxes. The city of Manhattan established an East Manhattan gateway plan area that proposed their annexation of 13 square miles from Tuttle Creek Boulevard to Hopkins Creek Road (Figure A1). If the gateway becomes annexed, it would be a boon to the Manhattan economy and increase property values on new and existing housing and rental stocks. However, it could also threaten farmers currently operating within the plan area. The PT commission rezoned 70 acres just east of the gateway—from agricultural to intermediate-density residential—to pave the way for more subdivision development (Peoples, 2025). So, pressures will continue to mount on Blue Township leaders to incorporate.

Figure A1. East Manhattan, Kansas, Gateway Plan Area

Image source: City of Manhattan, Kansas (2025).