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One Place Doesn't Fit All: Improving the Effectiveness of Sustainability Standards by Accounting for Place

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The growing interest in incentivizing sustainable agricultural practices is supported by a large network of voluntary production standards, which aim to offer farmers and ranchers increased value for their product in support of reduced environmental impact. To be effective with producers and consumers alike, these standards must be both credible and broadly recognizable, and thus are typically highly generalizable. However, the environmental impact of agriculture is strongly place-based and varies considerably due to complex biophysical, socio-cultural, and management-based factors, even within a given sector in a particular region. We suggest that this contradiction between the placeless generality of standards and the placed-ness of agriculture renders many sustainability standards ineffective. In this policy and practice review, we examine this contradiction through the lens of beef production, with a focus on an ongoing regional food purchasing effort in Denver, Colorado, USA. We review the idea of place in the context of agricultural sustainability, drawing on life cycle analysis and diverse literature to find that recognition of place-specific circumstances is essential to understanding environmental impact and improving outcomes. We then examine the case of the Good Food Purchasing Program (GFPP), a broad set of food-purchasing standards currently being implemented for institutional purchasing in Denver. The GFPP was created through a lengthy stakeholder-inclusive process for use in Los Angeles, California, USA, and has since been applied to many cities across the country. The difference between Los Angeles' process and that of applying the result of Los Angeles' process to Denver is instructive, and emblematic of the flaws of generalizable sustainability standards themselves. We then describe the essential elements of a place-based approach to agricultural sustainability standards, pointing toward a democratic, process-based, and outcome-oriented strategy that results in standards that enable rather than hinder the creativity of both producers and consumers. Though prescription is anathema to our approach, we close by offering a starting point for the development of standards for beef production in Colorado that respect the work of people in place.

Keywords: food system, agricultural sustainability, food policy, urban-rural linkages, local food

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INTRODUCTION

The environmental sustainability of agriculture has become a subject of major interest, with many calling for a wholesale restructuring of agricultural systems within a social-ecological framework that ensures adequate provisioning of food while also protecting (or improving) the environment (Pretty, 2008; Gordon et al., 2017). These calls are a reflection of agriculture's large environmental impacts; agriculture occupies about 38% of earth's land surface, causing roughly 70% of projected biodiversity loss and anywhere from 10 to 45% of anthropogenic greenhouse gas emissions (Foley et al., 2011; Garibaldi et al., 2017). These impacts are projected to increase as production levels rise and purchasing habits change among the projected population of 10 billion by 2060 (Pelletier and Tyedmers, 2010; Gerland et al., 2014; Hunter et al., 2017).

In addition to scientific research to help identify best practices, the transition to a more environmentally sustainable agriculture can be supported by making adoption of those practices economically advantageous to producers (Blackman and Rivera, 2011). Such governance has historically been the domain of international and national regulation, wherein best practices were enforced by fines and other punitive measures (Brunsson and Jacobsson, 2000). Increasingly, though, adoption of sustainable agricultural practices is supported through voluntary production standards which, instead of the "stick" of punitive measures, offer the "carrot" of increased product value (Ponte and Cheyns, 2013; Tayleur et al., 2017; Lambin and Thorlakson, 2018). As environmental attributes are often invisible to the consumer, this increased value relies on the development of broad "sustainability networks" to create, verify, and enforce standards, thereby establishing recognizability and credibility with consumers (Ponte and Cheyns, 2013; Bonroy and Constantatos, 2015).

However, agriculture is fundamentally place-based, with culture, climate, history, and other local circumstances interacting in complex ways to create production systems with distinct environmental impact profiles. For example, life cycle analysis estimated the normalized water footprint among six fundamentally different beef production systems in New South Wales, Australia as ranging from 3.3 to 221 L of H_2O equivalent per kg of live weight (Ridoutt et al., 2012). Though it is just one component of environmental impact, that the water footprint of beef production can vary by a factor of 67 within a single Australian state points to the complexity inherent to broad-scale agricultural sustainability assessments, and more specifically to the simplification behind all-too-common generalizations about beef production.

The apparent contradiction between the placed-ness of agriculture and the placeless-ness of generalizable agricultural sustainability standards is the subject of this policy and practice review. Specifically, how can broadly applicable sustainability standards improve environmental outcomes if those outcomes are dependent on highly place-based factors? Is it possible to design sustainability standards that are widely recognized and trusted while also locally adaptable? We examine these questions by drawing on lessons from our work on an initiative in Denver, Colorado, USA, aimed at increasing the share of Colorado-grown agricultural products in City of Denver institutions. This still-evolving initiative is guided by the Good Food Purchasing Program (GFPP), a food system rating metric that integrates a set of well-known, third-party sustainability, food justice, economic, and labor standards (Lo and Delwiche, 2016). Though we have worked with producers from many agricultural sectors, we focus on beef production for most of our examples because it is a significant component of Colorado agriculture and among the most controversial sectors.

We begin by reviewing the idea of place, including sociological, political, and ecological conceptions. We do so in the context of agricultural sustainability, integrating lessons from life cycle analysis and literature from multiple disciplines. How important to a proper understanding of sustainable agriculture is knowledge of place-specific circumstances? Next, we discuss place in the context of agricultural sustainability standards. We review the literature on the role of such standards, with an eye toward the political dimensions of their design and implementation. Do top-down, generalizable standards preserve the *status quo* and prevent a broad re-envisioning and restructuring of the food system? Are there tradeoffs involved in implementing a more democratic approach? To explore these questions, we take an in-depth look at the GFPP. Finally, we propose a starting point for creating place-adapted sustainability standards for Colorado, again using the example of beef production.

PLACE AND LIVESTOCK

How might we situate "place" in studying the deployment of beef sustainability standards? Though often implicitly and sometimes explicitly used to shape the way we think about standards, "place" can mean a variety of things. Does it refer to the innumerable, unique combinations of landscape features such as soil texture, hydrology, weather patterns, terrain, and biota? Is it determined by government boundaries, property ownership, and/or production and consumption? Or perhaps it may refer to a sense of home or belonging, or remind one of where they feel "at home"? All of these impulses signify boundaries and flows, whether they be social, political, economic, or biophysical. Indeed, the meaning, function, and construction of place can be viewed through many lenses. In the end, practice helps us understand how place is constituted by this variety of forces. In the social sciences, practice theory grounds phenomena like knowledge, values, feelings, emotions, and affectivities in everyday encounters and activities, emphasizing endogenous and emergent dynamics (Carolan, 2017). It argues that practices are the ongoing flow, or habituation, of these dynamics as manifested at a given point in time.

A biophysical approach to place often centers upon bioregionalism. This includes, for example, particular natural communities or watersheds, as well as unique human cultures which arise out of the natural limits and potentials of a region (Lynch et al., 2012). Bioregional beef production is generally adapted to local precipitation, soils, climate, and biota. For example, precipitation generally decreases from east to west

across North America. In addition to influencing the types and quantity of plant biomass, this precipitation gradient, combined with other biophysical differences, would be expected to strongly influence the suite of appropriate management practices for beef production. For instance, a beef producer in New York, USA can graze the same pasture several times in one growing season without degrading it, while those in Colorado, USA generally graze unirrigated pastures just once. This fact alone has significant impact on recommended stocking rates to support regenerative land management recommendations.

As a second example, in the southern latitudes of North America with subtropical climates, *Bos indicus* breeds, which are evolutionarily adapted to high heat and humidity due to greater skin surface area enabling greater heat evaporation, are common. These breeds can effectively produce beef and milk for human consumption despite the environmental stress of the local climate. In more northern latitudes, *Bos taurus* breeds, such as Angus cattle, are more common. Their thicker hair coat and greater fat storage capacity make them better suited to colder climates than their *Bos indicus* counterparts. The thicker hair coat and dark coloring of black Angus cattle make them less well-adapted to sunny, hot, and humid climates. However, these cattle are also common at southern latitudes despite their lack of evolutionary adaptation. While individual animals can adapt somewhat to novel environments, this ability to adapt does not make them better suited to hot and humid climate conditions than *Bos indicus* cattle and therefore does not alone explain the prevalence of these breeds at southern latitudes.

Clearly, then, management practices are based on a constitution of place that is more than simply biophysical or bioregional. The practices of a beef producer in eastern Colorado, USA share much more in common with a beef producer in Virginia, USA than they do with pastoralists in the grasslands of Mongolia, who face more similar biophysical challenges. As an example of how environmental outcomes are disproportionately affected by the dynamics of place, we point to the broad range of environmental footprints for beef production systems across the United States. Recently, the U.S. beef industry commissioned the most comprehensive, national assessment of beef's environmental footprints (Rotz et al., 2019). To accomplish this task, beef producers from every state except Alaska were surveyed and/or interviewed about their management practices (Asem-Hiablie et al., 2015, 2016, 2017, 2018a,b). "Representative operations" were developed from the information reported by producers and were analyzed for their production and environmental footprints following a methodology developed by Rotz et al. (2013). All environmental impacts incurred on the farm and in the production of farm inputs were considered in this analysis ("cradle-to-farm gate"). The study evaluated beef production systems for their carbon footprint (a measure of greenhouse gas emissions per pound of beef produced), reactive nitrogen footprint (a measure of reactive nitrogen loss per pound of beef produced), water footprint (a measure of non-precipitation water use per pound of beef produced), and fossil energy footprint (a measure of non-renewable energy use per pound of beef produced).

Two pertinent conclusions are drawn from the results of this study, further justifying the need for place-based sustainability standards. While environmental impacts are a function of both management practices and biophysical processes, biophysical place was a greater driver of the differences in environmental footprints between regions than management practices despite the fact that some practices are clearly manifestations of socioeconomic conceptualizations of place (Rotz et al., 2019). As an example of biophysical conceptualizations of place driving environmental outcomes, reactive nitrogen losses are driven by climate and soil type. As a result, reactive nitrogen footprints were greater in wet than arid regions, irrespective of differences in management practices across regions. This was partially correlated with differences in management practices, with operations in wetter regions also using more nitrogen fertilizer than operations in drier regions.

On the contrary, as an example of socioeconomic conceptualizations of place driving environmental outcomes, the arid and semi-arid climates of the states in the Southwest, Northwest, Northern Plains, and Southern Plains as defined in the study might lead one to conclude that crop production was minimal in these regions. However, the technological advancement of irrigation enabled crop production in these regions, and thus resulting in greater blue water (i.e., surface and ground water) footprints than wetter regions. Were biophysical constraints the sole arbiter of practice, crop production would be less common in these regions. As demonstrated, generalized sustainability standards inherently cannot account for differences in bioregional place, thus reducing their efficacy in achieving their objective of mitigating environmental impacts.

Interestingly, the authors concluded that recommendations to improve the sustainability of beef cattle operations across the U.S. should not be made using national generalizations; rather, they should be made on an individual operation basis. Clearly, sustainability standards which enforce generalized practices may result in more harm than good, due to the interaction of biophysical processes with management.

If we extend our understanding of place to include political, economic, and socio-cultural elements, we see that it is problematic to expect people in a locale to have the agency to achieve sustainability, especially as defined by others not of that place. For example, the Green Revolution has been repeatedly criticized for its promotion of a one-size-fits-all approach to food security, which is to say, it is based heavily on standardized (i.e., place*less*) knowledge and practices (Carolan, 2018). A core principle, then, to emerge out of movements looking to supplant this mindset is to afford *situated* supply chains, which refers to food and production systems that are informed by a place's ecological, climatological, socio-cultural, infrastructural, and economic realities (Perfecto et al., 2009). Standards aimed at enhancing principles such as environmental sustainability or community resilience, especially those exported from elsewhere, can therefore present a challenge when not properly grounded to those situated nuances.

The way that standards are exported from elsewhere is also a reflection of how place is tied to various scales of government and economics, of which there can be contention

and power imbalances concerning who or what does or ought to constitute place. For example, some have found that the meaning people ascribe to place is connected to ideas about property, conservation, and governance, of which there can be disagreement (Yung et al., 2003). This suggests that decision-making and forms of government are actively constructing and maintaining "place." Others emphasize the roles of markets in relation to place. For example, some examine the potentially valuable role of scaling-up localized agricultural markets (e.g., Friedmann, 2007), while others have problematized what "local" means in this context (e.g., Hinrichs, 2003). Economic approaches may also be focused more on the role of global markets on the development of particular places (Raynolds et al., 2004). However, others have argued that global market forces must be challenged through various forms of citizenry which marries alternative markets with environmentalism through common ties to place and physical engagement with place (DeLind, 2000; Reid and Rout, 2016).

Socio-cultural perspectives are often more focused upon the social construction of place. For example, some have defined place "as a space that has been imbued with meaning through personal, group, and cultural processes" (Cross, 2015, p. 494), where, biophysical, political, and economic processes and boundaries are subsumed by socio-cultural meaning of a space. From a more critical perspective, others focus upon how place often shapes and is shaped by community ideology (Hummon, 1990). Put another way, place is constructed through the articulation of a sense of belonging, which is based upon various ties of sentiment, interest, value, and knowledge. Further, place is a historical process based upon social practices related to inequality, difference, power, politics, interaction, community, and social movements (Gieryn, 2000).

We argue that social, political, economic, and biophysical processes are all valuable in conceptualizing place. To tie these together, we suggest understanding place as the result of practice. Place as a practice refers not only to what people do within place-based biophysical constraints, but also recognizes how place is constructed by social, economic, and political practices, which may transcend biophysical boundaries. This approach to place emphasizes it as a process that shapes, and is shaped by, people in both material and symbolic terms. As Camus observed, place is "not just something people know and feel, it is something they do" (Camus, 1959, p. 88). Put simply, practice is what is done to connect how people feel about place with what they know about place and may not necessarily be tied to experience in a locale, but often is. Taken historically, this suggests that place can be a moving target, and one in which culture and politics tend to shape how place gets done as much as climate or biota.

If a more holistic conception of place is essential to understanding both management practices and outcomes in beef production, and if this is bound to be spatiotemporally dynamic and multivariate, this has important ramifications for creating and applying standards to advance agricultural sustainability. Indeed, given not only the reality but the importance of the dynamism of place, it may be that generalized, static, or externally imposed standards may not be merely ineffective but potentially harmful. However, as we have seen, sustainability standards must be broadly recognized to be credible and therefore effective. Building the foundation for reconciling the apparent contradiction between the importance of place in agriculture and the effectiveness of sustainability standards is the subject of the rest of this paper.

PLACE, PRACTICE, AND SUSTAINABILITY STANDARDS

Standards are a ubiquitous aspect of modern life. They are the indicators and measures by which people, practices, processes, and products are assessed (Loconto and Busch, 2010). However, the metrics used for evaluation, such as sustainability measures, can have unintended consequences (Rosin et al., 2017). Indicators can also be viewed as fallible, especially in the context of sustainability assessments (Bell and Morse, 2008). However, others have suggested the utility in viewing indicators of sustainability as performative—as building toward particular worlds (Hale et al., 2019). This approach views standards from a more pragmatic perspective that acknowledges their limitations but posits the impact that they can have on iteratively generating conversations and relationships that may have not have otherwise occurred.

Yet, standards themselves can constrain sustainability practices and conversations. For one, broadly applicable standards are necessarily constrained to assessing broadly used production practices. This may limit qualifying producers to those within the mainstream, and thereby play a role in preserving rather than challenging the *status quo*. Indeed, the outcomes of forms of accountability, such as standards, are related to how effective the participatory processes were in shaping the standards, suggesting a tension between socializing forms of accountability and standards which can de-socialize practices (Hale et al., 2020). In other words, democratic and participatory processes are vital to constructing just, place-based standards.

The Good Food Purchasing Program

Like many cities, Denver, Colorado, USA is exploring how its institutional food purchasing policies can be adapted to better support its broader, values-based goals (Jablonski et al., 2019). These values relate to environmental sustainability, food and economic justice, and regional purchasing to better support local communities and economies, including regional rural communities. Toward this end, the Denver Sustainable Food Policy Council (SFPC), one of the city's Mayor-appointed Boards and Commissions, created a City Food Purchasing Standard Policy Working Group. Through this working group, the SFPC has recommended the implementation of the Good Food Purchasing Program to "stimulate a robust and resilient world class food system through sound institutional purchasing policies" (Denver Sustainable Food Policy Council, 2018, p. 1).

The GFPP emerged from the work of the Los Angeles Food Policy Council (California, USA). Recognizing that institutions across the U.S. spend billions of dollars on food purchases, and that these purchases can be reapportioned via policy change to

better achieve non-financial goals, Los Angeles set out to create and apply a rigorous and systematic process for incorporating values into its food procurement process. Creating the GFPP in Los Angeles was the culmination of a two-year, multi-stakeholder process that included "the Food Chain Workers Alliance, Natural Resources Defense Council, Compassion Over Killing, and the Los Angeles County Department of Public Health, as well as farmers, processors, distributors, chefs, large public and private institutional buyers, school food advocates, and faith-based leaders" (Lo and Delwiche, 2016, p. 187). While all stakeholders recognized the importance of leveraging the buying power of large institutions to create food system change, the leaders of this effort note that the process of creating standards to meet a multitude of goals was often conflicted (Delwiche and Lo, 2013; Lo and Delwiche, 2016). Nevertheless, the diversity of the group and the length of the process were noted as strengths.

Ultimately, the GFPP was structured to address five "values": local economies; environmental sustainability; valued workforce; animal welfare; and health and nutrition. It consists of a tiered, points-based rating system whereby participating institutions can choose how aggressively they want to pursue improvement in each of the value categories. However, the GFPP does require that institutions meet baseline standards in each category, so that "institutions are not able to limit themselves to changes that are easy" (Lo and Delwiche, 2016, p. 188). Though implementation is ongoing in Los Angeles, the program notes that, through implementation by the city school district, $12 million has been redirected to local produce purchasing, "healthier" breads have been made available, 150 jobs have been created, antibiotic free chicken is now being purchased, and a 15% decrease in meat spending has been realized with the addition of "meatless Mondays" (Bronsing-Lazalde, 2020).

A key innovation of GFPP is the use of existing, well-known third-party certification programs. For example, the environmental sustainability value includes such standards as American Grassfed Association, Animal Welfare Approved, Food Alliance Certified, Seafood Watch, and U.S. Department of Agriculture Organic. Qualification for different standards achieves different "levels" under each of the value categories. Use of broad-scale standards makes the program relatively easy to implement in other municipalities, as opposed to following Los Angeles' extensive process in each place. Many cities across the US are in various stages of implementing GFPP, including: Austin, Texas; Chicago, Illinois; Cincinnati, Ohio; Oakland, California; San Francisco, California; and Minneapolis-St. Paul, Minnesota. Denver is currently implementing baseline assessments for its school district and city jails, with other institutions interested.

However, we contend that something is lost in eliminating the lengthy and inclusive process used in creating the GFPP for use in Los Angeles. Though the city has collected precursor data via a Food Vision (City of Denver, 2017), and sought input through meetings with a procurement subcommittee of the SFPC, the process has not been inclusive of regional farmers and ranchers or other key stakeholders. The challenges this creates are already evident in Denver as the city works to promote consensus around the adoption of the program. Here, we highlight two place-based sticking points: first, USDA organic as the "level 3" criterion (the highest level) for most commodities under the environmental sustainability value; and second, the awarding of points under the "animal welfare" category for reducing the total volume of animal products purchased. In both cases, challenges arise due to the blanket adoption of values or standards without enough regard to how their implementation will result in different impacts based on local context.

Much research has been devoted to comparing the soil health impacts of conservation tillage (a.k.a. no-till), which uses herbicides instead of mechanical tilling to kill existing vegetation and prepare ground for planting, to organic farming (Carr et al., 2012). Because most herbicides are banned in organic agriculture, it still relies heavily on conventional tillage (Luna et al., 2012). This can have negative effects on erosion potential, aggregate diameter, water-holding capacity, and, perhaps most significantly due to the ramifications for climate change, organic carbon in the soil (Luna et al., 2012). These effects can be exacerbated in drought-prone, semi-arid croplands such as those found in eastern Colorado (Knapp, 1983; Mikha et al., 2013). It is therefore doubtful that uniformly encouraging conversion to organic production practices, especially among dryland farming operations in eastern Colorado, will lead to improvements in environmental sustainability in the same way it might in different climates.

A second, more controversial, and somewhat perplexing example can be found under GFPP's animal welfare value. In order to be awarded full points, institutions have the option of either increasing their proportion of animal products certified as high animal welfare or reducing the total volume of animal products produced. Level 3 points in this case can include replacing 40% of the total volume of animal products purchased with plant-based proteins. Given that this target is under animal welfare, it appears to assume that reduced purchases, and therefore production, of animal products will lead to improved conditions for the remaining animals. The justification for this assumption is unclear. We cannot help but wonder about the composition of the stakeholder group that formulated GFPP, where it appears that representatives from animal agriculture were few while those from animal rights group were many. While this may have been suitable for southern California, it is fair to conclude that a stakeholder group representative of the Colorado food system, where the beef industry is a key stakeholder and vast areas of land are only suitable, agriculturally-speaking, for livestock production, would arrive at a different approach to improving animal welfare.

There are many other examples of local concerns about GFPP, both related to elements within specific standards and the program structure overall. For example, in focus groups with Colorado ranchers about GFPP, many have expressed confusion about elements of the Animal Welfare Approved standard, such as weaning of calves at 8 months of age, which they thought to be unrelated to welfare, and prohibitions of electric prods, which they said improve cattle welfare when used judiciously in dangerous situations. Additionally, many objected to the prohibition on branding of cattle, both from a socio-cultural and practicality perspective. In our view, whether the ranchers or

the standards are correct on these matters is immaterial; rather, because the ranchers played no role in creating the standard and find some elements to be non-sensical, the chances of broad-scale adoption, and thus broad-scale change, are greatly diminished. We believe that this "prescriptive to a fault" characteristic of many standards does more harm than good.

Additionally, the Denver SFPC's procurement committee has advocated for adding a sixth value category of food justice and racial equity to the program, but GFPP does not allow this. Indeed, it appears that the GFPP is almost entirely inflexible when it comes to local adaptation. This is for practical reasons; the Center works with participating municipalities and institutions to monitor progress toward GFPP goals. If each participating GFPP institution had different standards, it would increase costs associated with monitoring and verification. This is how the key innovation of GFPP—using broad, well-known standards—becomes a liability. If the standards are not locally adaptable and if the GFPP is inflexible in assigning points to the standards, as has been indicated both in general documentation and specific communications, then the program is not suited to the particulars of place and the democratic processes that are essential to integrate if we are to truly improve agricultural sustainability.

Toward Place-Based, Democratic Standards

Community Readiness

An important place-based characteristic is a community's "readiness" for policy interventions. Community readiness is generally thought of as a community's capacity for change. The community readiness literature has looked especially closely at the implementation of prevention (e.g., drug, obesity, crime) programs to understand the unevenness of their success across communities. It indicates that there is more to a program's success or failure than whether it was poorly planned and implemented or lacked sufficient funds to carry out goals. In many cases, failure is attributable to the prevention programming not receiving sufficient community support, with some programs being met with outright resistance (Hawkins et al., 1992; Donnermeyer et al., 1997).

In cases of program failures, the community might not be ready to accept that there is a "problem." Alternatively, there may be disagreement over the specifics of the problems—e.g., is it a drug problem or, say, a mental health or economic problem (or some mixture of all of the above). Or perhaps the community lacks social cohesiveness and distrusts local and governmental institutions, in which cases community-based prevention programs are destine to failure until these deep sociological problems are tended to.

Carcasson and Sprain (2016, p. 42) outline a number of things communities need to be able to do when seeking to create potentially system-changing interventions. According to their vision of community readiness, communities must have the ability to afford:

(1) Broad, diverse engaged audiences who are exposed to quality information and a willingness to consider multiple perspectives;
(2) Genuine opportunities for those audiences to work through the inherent tensions, trade-offs and paradoxes of issues;
(3) Ongoing collaborative and complimentary actions that allow for productive "responses" to those tensions.

We mention this literature as a reminder that even well-planned and financed policies will fail if a community is not ready to accept the interventions or if they are insufficiently resilient to work through the inevitable tensions and shocks that interventions bring. When considered in the context of place-based food standards, the community readiness literature teaches us that places also have varied assets and liabilities when understood from the perspective of elements like social, cultural, and economic capital. Whether communities can successful implement such standards are a function of those assets—their level of community readiness. The decision to start a process such as GFPP must therefore account for this across the area of potential impact—there may be instances where it is better to not begin than to do so without an understanding of capacity, especially given the fundamental importance of food.

Part of the challenge in the case of Denver, as well as many of municipalities enacting this type of policy, is that there is often not alignment in readiness across regions. Communities, such as Denver, must operate within the confines of their political authority, in this case the city and county. Seventy-one percent of food policy councils in North America operate at the county or sub-county (e.g., city) level (Bassarab et al., 2019). Yet, it is very unlikely that most counties, particularly those that are urban, can meet their own food needs. As an example, according to the latest Census of Agriculture, Denver County included 12 agricultural operations, none of which were over $100,000 in sales (USDA NASS, 2017). Accordingly, the possibility that Denver will meet its own institutional food demands is nil, and regional producers must be meaningfully incorporated into discussions before Denver is ready to begin the process of discussing values-based food procurement standards.

Putting Place Into Practice

A key shift in moving toward place-based, democratic standards is from an outcome-based to a process-based approach. In this we are informed and inspired by the literature on the benefits of collaboration in natural resource management. It is increasingly recognized that top-down, consultative approaches to difficult natural resource challenges often do not lead to positive long-term outcomes (Pretty, 2008). Instead, social capital is emerging as a key element in achieving lasting solutions, with process elements such as commitment, empathy, respect, transparency, and predictability perhaps as important as good science or financial resources (Wagner and Fernandez-Gimenez, 2008).

Because successful standards are built on trust, between the standard and both those being certified and those purchasing the certified products, this finding suggests an exciting pathway for a new kind of standard, one in which the process of creating the standard, rather than institutional authority, is what builds

TABLE 1 | Operationalizing place as practice: domains, boundaries, and flows.

Domain	Boundaries	Flows	Examples
Biophysical	What are the biophysical boundaries of this place?	What are the biophysical connections this place has with other places?	Water, biota, hills, air
Political	What are the politics and political boundaries of this place?	What are the politics and political connections this place has with other places?	Neighborhood, city, county, state boundaries; normative orientations toward how this place ought to be and how we get there
Economic	What are the economic boundaries of this place?	What are the economic connections this place has with other places?	Industries, labor, ownership, infrastructure
Socio-cultural	What are the socio-cultural boundaries of this place?	What are the socio-cultural connections this place has with other places?	Histories, identity, customs, attitudes, beliefs, values, norms

producer and consumer trust. Indeed, we assert that, absent a locally driven co-creative process, standards that rely on institutional authority to establish credibility gain the benefits of consumer trust without doing the work to ensure on-the-ground impact.

A shift toward process-oriented standards not only addresses the need for credibility, it also enables effective adaptation of standards across space and over time. Instead of existing as a set of inflexible prescriptions, a process-based standard for sustainable beef would instead support an iterative process for seeking gains in sustainability that are suited to place. This is not to suggest that "anything goes"—a set of transformative sustainability values and goals must be fundamental. However, the standard would not be prescriptive in determining how they are recognized and achieved but instead allow for the inherent creativity of people in place to determine that for themselves. This combination of transformative sustainability goals and locally adapted actions to achieve them prevents both bureaucratic overreach and local attenuation.

We have noted that, in addition to credibility, recognizability is a key component of successful standards. We contend that recognizability does not emerge from consistently prescriptive standards, but instead from a different kind of trust-building process between the consumers and the standard. This contention is supported by the significant literature on consumer perceptions of standards, which indicates that consumers generally have a poor understanding of what underlies different standards but instead respond to perceived quality, consistency, and clarity of the message (Becker, 2000; Codron et al., 2006; Abrams et al., 2010; Janssen and Hamm, 2012). Again, we are not suggesting something along the lines of "consumers will buy what we tell them to" but rather that the characteristics of interest to consumers are not inherent to broad, prescriptive standards. Indeed, they may reside more effectively within place-based, democratic, process-oriented standards, wherein the focus is on long-term outcomes rather than specific, esoteric production practices.

Finally, instead of ignoring tradeoffs, standards should acknowledge or even embrace them. For example, most sustainability standards ignore economic considerations for producers. Instead, it is assumed that increased product value will justify any expenses of transitioning to new production practices, based on the assumption that retail prices naturally and equitably translate to higher farm-gate prices, which may or may not be true depending on factors such as scale, commodity, location, and market channel (McBride and Greene, 2009). Even if a new certification does lead to increased farm-gate prices, it is still entirely possible that this may not justify the cost of the changes.

Instead of ignoring this potential reality, we suggest that standards should instead fundamentally integrate economic considerations. By embracing instead of ignoring potential tradeoffs, and building them into the standards, knowledge about potential economic challenges would be at the forefront for producers adopting new practices, and the standard could potentially play a role in transforming supply chains to more equitably distribute the food dollar. Numerous other potential tradeoffs should also be integrated, including among different environmental sustainability metrics, which are at times in conflict.

We suggest that operationalizing place as practice, something necessary to informing effective standards, must be an ongoing and iterative processes that values the bio-physical, political, economic, and socio-cultural dimensions of place. As an ongoing and iterative process, standards such as the GFPP must be thoroughly vetted and edited through engagement with stakeholders. As a way to stimulate collective engagement and action, and iterate how standards enact practices in place, we suggest the use of **Table 1** to stimulate conversation.

STARTING POINT FOR A COLORADO SUSTAINABLE BEEF STANDARD

Because we are proposing a place-based, democratic, and process-oriented approach to creating and applying sustainability standards, it is not appropriate to offer a prescription for a sustainable beef standard for Colorado. Instead, here we suggest a starting point for a more inclusive, just, and ultimately sustainable approach to achieving Denver's institutional purchasing goals. In doing so, we want to make clear that we recognize that this approach is likely to be more time-consuming and expensive. However, we also believe that it would also be more successful in the

long run for all stakeholders, including urban consumers and rural producers.

We propose that a beef sustainability standard for Colorado be based on shared core sustainability goals arrived at through an inclusive multi-stakeholder process that is evidence-based. Especially on a topic as important as sustainability, disagreements among stakeholder are often driven by opinion rather than science-based evidence. On the other hand, we recognize that science sometimes fails to adequately account for complexity, social factors, and its own biases. Nevertheless, agreeing to base the conversation on evidence rather than opinion can assist in finding areas of commonality.

Though there are certainly examples of beef sustainability goals (e.g., from the U.S. Roundtable for Sustainable Beef), establishment of these goals in Colorado must include all significant stakeholders, including but not limited to consumer advocates, rancher organizations, environmental organizations, federal agencies, labor groups, and policy makers. Though there are significant differences in perceptions of the beef industry and sustainability among these groups, we are confident that an inclusive, democratic process can arrive at a set of shared fundamental goals.

As a reminder, these goals should not be prescriptive about practices, but rather agreed-upon outcomes such as reduced greenhouse gas emissions, improved ecological health on rangelands, or increased share of the consumer food dollar for ranchers. Even in Colorado, however, there is a wide array of production systems and great climatic diversity. We therefore suggest that this goal setting process be regionally segmented. In all likelihood, there will be shared goals among different regions, but it may be that different regions prioritize these goals differently. At the same time, it is important to recognize that boundaries and flows are more than biophysical, and that a reconstitution of current boundary paradigms may be beneficial. Because the overall project is driven by Denver, the realities of urban consumers and city policies should permeate each region's process.

These goals should be examined through the lens of the different domains, boundaries, and flows detailed in **Table 1**. While it is important to set ambitious goals, it is also essential to ground them in the realities of place. Doing so will enable a realistic conversation among the various stakeholders. We believe that this can also help to bridge an urban-rural divide that may appear intractable but, we suggest, can be surmounted by understanding the place-based realities of those different from us. At the same time, it is also important to anticipate and even respect irreconcilable differences.

At this point, with shared goals, buy-in from stakeholders, and growing social capital, any number of paths forward may emerge. It may be that the use of third-party standards, or even a set of such standards such as the GFPP, may be the most appropriate choice, particularly in this case where Denver's goals extend far beyond beef. On the other hand, it is impossible to predict what this process, broadly applied across the food system, would lead to. What we are confident of is that it is much more likely to lead to the lasting systemic change that is necessary if we are to address the tremendous challenges facing agriculture and the food system.

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All authors contributed equally to conceptualization and writing of the work.

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REFERENCES

Abrams, K. M., Meyers, C. A., and Irani, T. A. (2010). Naturally confused: consumers' perceptions of all-natural and organic pork products. *Agric. Hum. Values* 27, 365–374. doi: 10.1007/s10460-009-9234-5

Asem-Hiablie, S., Alan Rotz, C., Stout, R., Dillon, J., and Stackhouse-Lawson, K. (2015). Management characteristics of cow-calf, stocker, and finishing operations in Kansas, Oklahoma, and Texas. *Profess. Anim. Sci.* 31, 1–10. doi: 10.15232/pas.2014-01350

Asem-Hiablie, S., Rotz, C. A., Sandlin, J. D., Sandlin, M. R., and Stout, R. C. (2018a). Management characteristics of beef cattle production in Hawaii. *Profess. Anim. Sci.* 34, 167–176. doi: 10.15232/pas.2017-01691

Asem-Hiablie, S., Rotz, C. A., Stout, R., and Fisher, K. (2017). Management characteristics of beef cattle production in the western United States. *Profess. Anim. Sci.* 33, 461–471. doi: 10.15232/pas.2017-01618

Asem-Hiablie, S., Rotz, C. A., Stout, R., and Place, S. (2018b). Management characteristics of beef cattle production in the eastern United States. *Profess. Anim. Sci.* 34, 311–325. doi: 10.15232/pas.2018-01728

Asem-Hiablie, S., Rotz, C. A., Stout, R., and Stackhouse-Lawson, K. (2016). Management characteristics of beef cattle production in the Northern Plains and Midwest regions of the United States. *Profess. Anim. Sci.* 32, 736–749. doi: 10.15232/pas.2016-01539

Bassarab, K., Clark, J. K., Santo, R., and Palmer, A. (2019). Finding our way to food democracy: lessons from us food policy council governance. *Politics Govern.* 7, 32–47. doi: 10.17645/pag.v7i4.2092

Becker, T. (2000). Consumer perception of fresh meat quality: a framework for analysis. *Br. Food J.* 102, 158–176. doi: 10.1108/00070700010371707

Bell, S., and Morse, S. (2008). *Sustainability Indicators: Measuring the Immeasurable?*. 2nd ed. London: Earthscan.

Blackman, A., and Rivera, J. (2011). Producer-level benefits of sustainability certification. *Conserv. Biol.* 25, 1176–1185. doi: 10.1111/j.1523-1739.2011.01774.x

Bonroy, O., and Constantatos, C. (2015). On the economics of labels: how their introduction affects the functioning of markets and the welfare of all participants. *Am. J. Agric. Econ.* 97, 239–259. doi: 10.1093/ajae/aau088

Bronsing-Lazalde, C. (2020). *GFPP Impact. Center for Good Food Purchasing.* Available online at: https://goodfoodpurchasing.org/impact/ (accessed January 23, 2020).

Brunsson, N., and Jacobsson, B. (2000). *A World of Standards*. Oxford: Oxford University Press. Available online at: http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-132522 (accessed December 19, 2019).

Camus, A. (1959). *Noces Suivi de l'eté*. Paris: Editions Gallimard.

Carcasson, M., and Sprain, L. (2016). Beyond problem solving: reconceptualizing the work of public deliberation as deliberative inquiry: deliberative inquiry. *Commun. Theor.* 26, 41–63. doi: 10.1111/comt.12055

Carolan, M. (2017). More-than-active food citizens: a longitudinal and comparative study of alternative and conventional eaters: more-than-active food citizens. *Rural Sociol.* 82, 197–225. doi: 10.1111/ruso.12120

Carolan, M. (2018). *The Real Cost of Cheap Food*, 2nd ed, New York, NY: Routledge

Carr, P. M., Mäder, P., Creamer, N. G., and Beeby, J. S. (2012). Editorial: overview and comparison of conservation tillage practices and organic farming in Europe and North America. *Renew. Agric. Food Syst.* 27, 2–6. doi: 10.1017/S1742170511000536

City of Denver (2017). *Denver Food Vision*.

Codron, J.-M., Siriex, L., and Reardon, T. (2006). Social and environmental attributes of food products in an emerging mass market: challenges of signaling and consumer perception, with European illustrations. *Agric. Hum. Values* 23, 283–297. doi: 10.1007/s10460-006-9000-x

Cross, J. E. (2015). Processes of place attachment: an interactional framework: processes of place attachment. *Symbol. Interact.* 38, 493–520. doi: 10.1002/symb.198

DeLind, L. B. (2000). Transforming organic agriculture into industrial organic products: reconsidering national organic standards. *Hum. Organ.* 59, 198–208. doi: 10.17730/humo.59.2.hm8263678687n536

Delwiche, A., and Lo, J. (2013). Los Angeles' good food purchasing policy. *Prog. Plan.* 197, 24–28. Available online at: http://foodchainworkers.org/wp-content/uploads/2015/06/Delwiche-Lo-LA-Good-Food-Purchasing-PPM_Fall13.pdf

Denver Sustainable Food Policy Council (2018). *Issue Brief: City Food Purchasing Standards*. City of Denver.

Donnermeyer, J. F., Plested, B. A., Edwards, R. W., Oetting, G., and Littlethunder, L. (1997). Community readiness and prevention programs. *J. Commun. Dev. Soc.* 28, 65–83. doi: 10.1080/15575339709489795

Foley, J. A., Ramankutty, N., Brauman, K. A., Cassidy, E. S., Gerber, J. S., Johnston, M., et al. (2011). Solutions for a cultivated planet. *Nature* 478, 337–342. doi: 10.1038/nature10452

Friedmann, H. (2007). Scaling up: bringing public institutions and food service corporations into the project for a local, sustainable food system in Ontario. *Agric. Hum. Values* 24, 389–398. doi: 10.1007/s10460-006-9040-2

Garibaldi, L. A., Gemmill-Herren, B., D'Annolfo, R., Graeub, B. E., Cunningham, S. A., and Breeze, T. D. (2017). Farming approaches for greater biodiversity, livelihoods, and food security. *Trends Ecol. Evol.* 32, 68–80. doi: 10.1016/j.tree.2016.10.001

Gerland, P., Raftery, A. E., Ševčíková, H., Li, N., Gu, D., Spoorenberg, T., et al. (2014). World population stabilization unlikely this century. *Science* 346, 234–237. doi: 10.1126/science.1257469

Gieryn, T. F. (2000). A space for place in sociology. *Annu. Rev. Sociol.* 26, 463–496. doi: 10.1146/annurev.soc.26.1.463

Gordon, L. J., Bignet, V., Crona, B., Henriksson, P. J. G., Holt, T. V., Jonell, M., et al. (2017). Rewiring food systems to enhance human health and biosphere stewardship. *Environ. Res. Lett.* 12:100201. doi: 10.1088/1748-9326/aa81dc

Hale, J., Legun, K., and Campbell, H. (2020). Accounting for account-abilities: examining the relationships between farm nutrient measurement and collaborative water governance dynamics in Canterbury, New Zealand. *J. Rural Stud.* doi: 10.1016/j.jrurstud.2019.07.006. [Epub ahead of print].

Hale, J., Legun, K., Campbell, H., and Carolan, M. (2019). Social sustainability indicators as performance. *Geoforum* 103, 47–55. doi: 10.1016/j.geoforum.2019.03.008

Hawkins, J., Miller, J., and Catalano, R. (1992). *"Selecting the best approaches for your community,"* in *Communities That Care: Action for Drug Abuse Prevention*, eds J. Hawkins and R. Catalano (San Francisco, CA: Jossey-Bass Publishers), 107–116.

Hinrichs, C. C. (2003). The practice and politics of food system localization. *J. Rural Stud.* 19, 33–45. doi: 10.1016/S0743-0167(02)00040-2

Hummon, D. M. (1990). *Commonplaces: Community Ideology and Identity in American Culture*. Albany, NY: SUNY Press.

Hunter, M. C., Smith, R. G., Schipanski, M. E., Atwood, L. W., and Mortensen, D. A. (2017). Agriculture in 2050: recalibrating Targets for Sustainable Intensification. *BioScience* 67, 386–391. doi: 10.1093/biosci/bix010

Jablonski, B. B. R., Carolan, M., Hale, J., Thilmany McFadden, D., Love, E., Christensen, L., et al. (2019). Connecting urban food plans to the countryside: leveraging denver's food vision to explore meaningful rural–urban linkages. *Sustainability* 11:2022. doi: 10.3390/su11072022

Janssen, M., and Hamm, U. (2012). Product labelling in the market for organic food: consumer preferences and willingness-to-pay for different organic certification logos. *Food Qual. Prefer.* 25, 9–22. doi: 10.1016/j.foodqual.2011.12.004

Knapp, J. A. (1983). Conservation tillage for wind erosion control. *J. Soil Water Conserv.* 38, 237–238.

Lambin, E. F., and Thorlakson, T. (2018). Sustainability standards: interactions between private actors, civil society, and governments. *Annu. Rev. Environ. Resour.* 43, 369–393. doi: 10.1146/annurev-environ-102017-025931

Lo, J., and Delwiche, A. (2016). The good food purchasing policy: a tool to intertwine worker justice with a sustainable food system. *J. Agric. Food Syst. Commun. Dev.* 6, 185–194. doi: 10.5304/jafscd.2016.062.016

Loconto, A., and Busch, L. (2010). Standards, techno-economic networks, and playing fields: performing the global market economy. *Rev. Int. Polit. Econ.* 17, 507–536. doi: 10.1080/09692290903319870

Luna, J. M., Mitchell, J. P., and Shrestha, A. (2012). Conservation tillage for organic agriculture: evolution toward hybrid systems in the western USA. *Renew. Agric. Food Syst.* 27, 21–30. doi: 10.1017/S1742170511000494

Lynch, T., Glotfelty, C., and Armbruster, K. (eds). (2012). "Introduction," in *The Bioregional Imagination: Literature, Ecology, and Place* (Athens, GA: University of Georgia Press), 1–29

McBride, W. D., and Greene, C. (2009). *Characteristics, Costs and Issues for Organic Dairy Farming*. Washington, DC: USDA Economic Research Service. Available online at: http://www.ssrn.com/abstract=1510179 (accessed April 29, 2020).

Mikha, M. M., Vigil, M. F., and Benjamin, J. G. (2013). Long-term tillage impacts on soil aggregation and carbon dynamics under wheat-fallow in the central great plains. *Soil Sci. Soc. Am. J.* 77, 594–605. doi: 10.2136/sssaj2012.0125

Pelletier, N., and Tyedmers, P. (2010). Forecasting potential global environmental costs of livestock production 2000-2050. *Proc. Natl. Acad. Sci. U.S.A.* 107, 18371–18374. doi: 10.1073/pnas.1004659107

Perfecto, I., Vandermeer, J. H., and Wright, A. L. (2009). *Nature's Matrix: Linking Agriculture, Conservation and Food Sovereignty*. London: Routledge.

Ponte, S., and Cheyns, E. (2013). Voluntary standards, expert knowledge and the governance of sustainability networks. *Global Netw.* 13, 459–477. doi: 10.1111/glob.12011

Pretty, J. (2008). Agricultural sustainability: concepts, principles and evidence. *Philos. Transac. R. Soc. B Biol. Sci.* 363, 447–465. doi: 10.1098/rstb.2007.2163

Raynolds, L. T., Murray, D., and Leigh Taylor, P. (2004). Fair trade coffee: building producer capacity via global networks. *J. Int. Dev.* 16, 1109–1121. doi: 10.1002/jid.1136

Reid, J., and Rout, M. (2016). Getting to know your food: the insights of indigenous thinking in food provenance. *Agric. Hum. Values* 33, 427–438. doi: 10.1007/s10460-015-9617-8

Ridoutt, B. G., Sanguansri, P., Freer, M., and Harper, G. S. (2012). Water footprint of livestock: comparison of six geographically defined beef production systems. *Int. J. Life Cycle Assess* 17, 165–175. doi: 10.1007/s11367-011-0346-y

Rosin, C., Campbell, H., and Reid, J. (2017). Metrology and sustainability: using sustainability audits in New Zealand to elaborate the complex politics of measuring. *J. Rural Stud.* 52, 90–99. doi: 10.1016/j.jrurstud.2017.02.014

Rotz, C. A., Asem-Hiablie, S., Place, S., and Thoma, G. (2019). Environmental footprints of beef cattle production in the United States. *Agric. Syst.* 169, 1–13. doi: 10.1016/j.agsy.2018.11.005

Rotz, C. A., Isenberg, B. J., Stackhouse-Lawson, K. R., and Pollak, E. J. (2013). A simulation-based approach for evaluating and comparing the environmental footprints of beef production systems. *J. Anim. Sci.* 91, 5427–5437. doi: 10.2527/jas.2013-6506

Tayleur, C., Balmford, A., Buchanan, G. M., Butchart, S. H. M., Ducharme, H., Green, R. E., et al. (2017). Global coverage of agricultural sustainability

standards, and their role in conserving biodiversity. *Conserv. Lett.* 10, 610–618. doi: 10.1111/conl.12314

USDA NASS (2017). *USDA National Agricultural Statistics Service Census of Agriculture 2017*. Washington, DC: USDA NASS.

Wagner, C. L., and Fernandez-Gimenez, M. E. (2008). Does community-based collaborative resource management increase social capital? *Soc. Nat. Resour.* 21, 324–344. doi: 10.1080/08941920701864344

Yung, L., Freimund, W. A., and Belsky, J. M. (2003). The politics of place: understanding meaning, common ground, and political difference on the rocky mountain front. *For. Sci.* 49:12. doi: 10.1093/forestscience/49.6.855

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