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ON ADAPTING LOCAL FOOD SYSTEMS

Nelson Lobo

As a year passes, most of us grow older. Whether it be from having new experiences or hanging out with old friends, we evolve to become different people. Seeing, touching, sensing, tasting, and hearing, we search for meaning. Sometimes we come up empty-handed; other times we find solace in the bathroom mirror. I am reminded of a man standing starry-eyed on the street, accepting money for his newspapers. Of his past life, you and I know nothing. I like to imagine my man with a chain, a nice car, and too many bets on the wrong team, but who knows. Either way, he now lives on charity from the moving masses. One day he said to me, "One foot in front of the other; that's all we can really do." The shoes on his feet are a touch too thin, yet he walks forward no matter the condition. I take inspiration in his plight because I know desperation moves mountains. In a desperate state, we have arrived here. I would be lying if I said I didn't share your collective fears for the future and I would be dumb to forget the world we live in. In retrospect, the journey undertaken is in search of time lost. When you look around, what do you see? Weathered buildings, tired faces, cars blurring by...or a tapestry of people and nature, in a tug and pull for survival? The cement beneath our feet and the grass waving from the cracks invites renewal.

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As global warming quickly changes the landscape, shifting behaviors and adapting cities is becoming increasingly common and necessary. One must acknowledge how the average American lifestyle harms the Earth. The high quality of life enjoyed in the Western world comes at the cost of worsening environmental and social conditions, borne foremost by people in underdeveloped countries. The price of daily leisure, relaxation, and pleasure might just be human obsolescence. Insofar, maintaining the modern culture of consumption and endless waste has produced a state of existential denial in addressing future problems. Some of the issues taking shape concern increasing energy demand, ecological decline, and most saliently, food insecurity. Food is deeply fundamental to the livelihoods and culture of any sovereign nation.

Without food, humans are instead guided by the quest to satisfy hunger rather than the establishment of peace and justice. For context, ancient cities were constructed around basic human needs; necessities of life bringing people together in the name of safety, comfortability, and support. Infrastructure, labor, specialization, expanded networks of trade, and the extraction of resources from the hinterland became the new normal in growing centers of knowledge and population. However, as Sun Tzu once said, “an army marches on its stomach.” Urbanity exploded across the globe alongside the advent of agriculture; laborers, merchants, the elite, and whomever else found security within the confines of a city were on a diet of agricultural innovation. Nevertheless, urbanization was a paragon of wealth; the rich expanded upwards and outwards to aggrandize capital, build markets, and demonstrate power. In the global wake of accumulation, poverty quickly enveloped the suffering multitudes. Slums, exacerbated by entrenched wealth disparity, are as much a part of cities today as the bustling downtown cores. As food goes, the ones who reap the most may have sowed the least.

Cities worldwide depend heavily on the intersection of transportation, agriculture, and commerce to supply food for their populations. Urban areas in the United States generally rely on the amassing of grocery stores and restaurants in retaining a real sense of food security. While urban access to food is buttressed by community gardens, hunting and foraging, private plots, and food banks, the vast majority of people in cities directly sustain their needs through grocery stores and restaurants. Without a flow of capital to commercial suppliers, the food systems supporting society may fall apart. Moreover, the establishment of a diverse food supply also requires resource inputs and consistent management. A food bank cannot operate without purchased, produced, or donated goods and community gardens prosper thanks to the hard work of civilians, volunteers, and nonprofits. Looking forward, a natural progression of cities in the 21st century is the relocation of food production to the urban core. An inter-urban agricultural renewal would catalyze truly sustainable development. Yet when analyzing non-commercial sources of food, community gardens do appear to be great models for sustainable food production within cities. Aside from producing food, the benefits of community gardens are clear:

- *Creation of additional urban green space:*
 - Many lower-income neighborhoods are struck by the dual crises of food insecurity and limited access to green space. The absence of food options and spaces to relax only exacerbates the stressors of poverty.
- *Provision of opportunities for community gathering and civic engagement:*
 - Public space is essential in cities; without it, the power of participatory democracy is at risk. People need places to forge relationships and culture.
- *Restoration of connections to place:*
 - Humans are indebted to the land for food, clothing, and shelter. This essential bond is made less visible by industrial manufacturing; the consumer sees the final product, rather

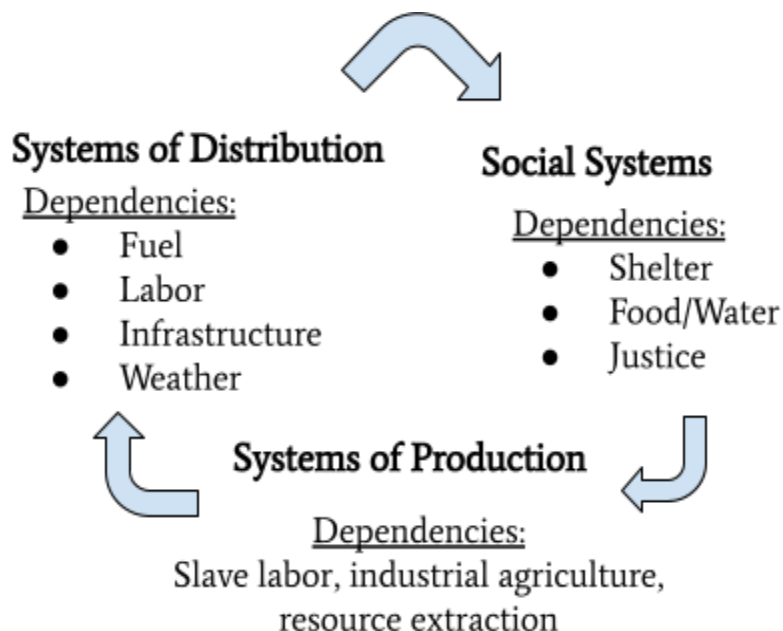
than the lengthy process of production. Community gardens help to restore an understanding of the value of land in meeting basic human needs.

- *Foundation of a vision and purpose:*

- Fragmentation of society grows stronger as people become more isolated. Alongside the dissipation of physical connections, any sense of shared values between community members grows weaker as public spaces disappear. Bringing people together in collaboration grows is a net-positive for communities seeking to define who they are and what they are about.

All that aside, disadvantages do exist. To function properly, community gardens require management, labor, and consistent upkeep, as well as water, fertilizer, seeds, tools, and transportation. Operational slowdowns can occur in the event of resource scarcity or economic disruption. As a model for climate adaptation, community gardens may fall flat when inputs cannot be adequately sustained. Problems also stem from the type of foods produced in community gardens. With harvests composed almost entirely of fruits and vegetables, vital sources of protein and fat are almost completely obtained from livestock, nuts, and grains produced via industrial processes.

The current state of local food systems is one of reliance on multiple scales. Consumers are dependent on producers, who are dependent upon the stability and predictability of the weather, markets, and society.



As the climate changes, shifting weather patterns and worsening environmental disruptions could lead to a breakdown in the current system of production, handling, distribution,

and consumption. If members of the community responsible for managing food banks, tending gardens, and running commercial food operations are struggling to feed themselves, the city has arrived at a truly precipitous crossroads. In this regard, innovation and adaptation are worthy goals. It must be said that the likelihood of a complete breakdown is uncertain at best. As the world warms, some crops may thrive, new technologies may develop, and centralized governments may acclimatize federal policies. That, however, does not free anyone from the responsibility of doing what is right for their local community with the best available information. As of right now, the best available information points to inadequacies and crumbling levels of resilience across multiple system dimensions. For example, North American food transportation is dependent on a reliable fuel source. Electrification notwithstanding, pushing thousands of fruit trucks up mountain passes is never a light task. If the systems for supplying fuel broke down, food distribution would grind to a halt. Now consider industrialized agriculture in the United States. The pressures of urban areas upon the American agricultural empire have resulted in inefficient monoculture systems exhausting the land and overwhelming its capacity for resilience. Changing weather patterns, depleted water sources, and eroding topsoil demonstrate the need for adaptation in order to maintain any semblance of consistent food production. It is illogical to assume millions of acres of degraded farmland can be reused endlessly to produce the quantity and quality of food humans depend on. In a bid to address the climate crisis, feed their citizens, and adapt to changing economic and environmental conditions, cities must attempt to reduce ecological impacts. One solution is twofold: cities have underutilized lots, green space, brownfields, and open areas harboring significant potential for renewal. While some lots are likely to have developers and plans at the ready, spaces of little economic and developmental value can be reimagined to efficiently produce food. In a political context, municipal governments must recognize existing spatial opportunities for food production and determine the land use type of those parcels.

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Urban areas are commonly referred to as the concrete jungle. Venture out to the East Coast of the United States and the absence of greenery and nature is ominous. Where the city never sleeps, plants rarely grow. However, greenery abounds in many cities across the world (*think Central Park in New York...*). Progressive and observant cities utilize open space preservation, greenways development, and innovation during the planning process. However, development must occur alongside a reconceptualization of the benefits environmental installations and modifications may confer. Nature is not solely to be admired. There is a rich history of tinkering with plants, animals, and land stretching long past the vicissitudes of colonization. Ultimately, the rapidly disappearing cultures of indigenous peoples are a blueprint for urban transformation.

In synthesizing the wisdom imparted by native peoples to develop more resilient cities, a question of values and ethics arises. In what ways are contemporary cultures and native ways of living different? How does the current role of humans in nature compare to past relationships? First and foremost, indigenous peoples' traditional interconnectivity with the environment is of an entirely different character spiritually, temporally, and observationally than that of a person living in a city. Inevitably, stark changes in lifestyle have created an absence in the general understanding of the role of Native Americans in the environment. In an exhaustive guide to traditional Californian land management entitled *Tending The Wild*, M. Kat Anderson concludes that "indigenous people achieve deeper intimacy with nature by using it." Native peoples exhibited an array of skills including careful observation of plant and animal behavior, the ability to use ecological disturbance as a tool, and detailed knowledge of local species characteristics. Moreover, "sharp understanding, diligent experimentation, and spiritual insight" (Anderson 2005) unlocked key understandings and attributes of the natural world. Biological information gleaned through lifelong practice meant California tribes knew exactly which plant species at what time of year could be harvested for what purpose. Flora and fauna retained special value and had specific applications. Many species of native California plants possessed a ritual use in basketry-weaving, hunting, and trapping. Consequently, tribes were exceptionally harmonious in their interactions with the land. A common misconception of indigenous American tribes comes from the idea of abundance. In California, edible plants and wild game existed on a prolific scale as evidenced by the journals of various colonists and early explorers. In 1848, James Lynch bore witness to vast herds of tule elk stretching across the San Joaquin valley. (2005) Along coasts and rivers, salmon were caught by the millions. However, food was not something to be mindlessly harvested and consumed. The metaphorical cornucopia of food to relentlessly harvest is a fiction of settler logic. Native tribes instead harbored a deep respect for the gifts of the natural world. Taking from the land was a balancing act; cultivating food sources and increasing productive capacity occurred simultaneously. Intentional harvesting maintained the quality of ecosystems and allowed for the manipulation of plants and animals to best suit tribal needs without harming the capacity of the land to produce food. Environmental degradation was rare in indigenous land use management; many oral stories espoused the arrogance of taking too much and not wasting what is taken. Complementary to this multi-dimensional knowledge of nature was a "kincentric worldview," (2005) encompassing plants, animals, geography, and the elements as one's own flesh and blood. Family was the center of the universe and the Earth was mother. This culture of compassion for the animate world reproduced a strong belief of respect for nature. To abuse the bonds of kinship by overharvesting, under-harvesting, or needlessly killing was to go swiftly against tradition.

When comparing the current state of the developed world to that of Earth's ancestral elders, values have clearly evolved and regressed, but remain tied to the land nonetheless. People and the environment are corporeally bound together in a tapestry Emma Marris elegantly defines as the "rambunctious garden." (2013) Though cities are mentally separate from nature, one will

find grass bursting at pavement seams and bird calls reverberating across the stone facades of high-rise apartment buildings. Even in the bramble of underpass and skyscraper, Mother Nature is not far away. In the end, all city-dwellers move about the built environment with a physical energy drawn from the land. The environment may have become artificial, but humans have always been tied to the bounty of the natural world. Unsurprisingly, many indigenous peoples' tribal namesake can be translated to mean people of the land. In *Braiding Sweetgrass*, Robin Wall-Kimmerer notes, "for all of us, becoming indigenous to a place means living as if your children's future mattered, to take care of the land as if our lives, both material and spiritual, depended on it." (9, 2013) Connections to place are invaluable to any community who understands the responsibility and gift of the land they inhabit. Obligations to nature also reveal an inherent faith in humanity. By tending the wild, people can directly bring about material and environmental conditions reinforcing the rights of their children to live and prosper. A belief in the land is a belief in one's progeny to continue the gift of being human through to the next generation. Still, the godfathers of capitalism have endowed the people with a dubious trust, a lack of hope, and an uncertainty for the future. In the tides of modernity, economic growth has washed away much of the hallowed ideals of authentic community that society so wishes to enshrine as the epitome of a perfect soul. However, there is much to be grateful for. To an extent, the power of democracy has allowed the luxuries of freedom, security, and peace to flourish. Goods are plentiful, life is great, and worries come and go. Cities ensure a sense of genuine togetherness, no matter the amendments to the social fabric yet to be realized. Unfortunately, the problems posed by climate change persist. So dissonant is the feeling of the moment when one's eyes are on the horizon. To instill resiliency and the capacity to adapt into future systems of food production, what steps must be taken? In the eyes of an indigenous Californian, the current structures for producing food are too dispersed across time and space, too careless in their lack of attention to detail, riddled with profligacy, and wholly cruel in their treatment of life. In reimagining modern agriculture, a Sierra Miwok might recommend to limit the use of space, to increase the yield of plants by selective harvesting, and to make do with less. Posed as a question to a municipal government, one might ask: how can local food systems be developed in ways utilizing green space, maximizing productive yield, requiring low management, and building a stronger connection to place? Introducing, restoration agriculture.

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Tucked under the umbrella of ecosystem restoration, restorative agriculture is guided by what farmer Mark Shepard calls "the prime directive." (2013) Emphasizing care for the earth, care for the people, and an equitable distribution of resources, this "triumvirate ethic" (2013) provides a set of values through which restoration work occurs. Restorative land management manifests as a perennial agricultural system where removing carbon dioxide, purifying water, increasing soil depth and fertility, adding wildlife habitat, and creating natural beauty are fundamental goals. (2013) Through intelligent design, perennial restorative agriculture can create

ideal environmental conditions and increase yields at a diminishing yearly labor cost. While ecosystem restoration is about replicating preferred or historic environmental conditions, restorative agriculture focuses on maximizing or optimizing the productive value of land in a regenerative manner. In practice, well-designed regenerative agriculture assimilates wastes, breeds resistant and hardy plant species, is locally adapted, restores soil, and meets human needs. (2013) When compared to industrialized monocrop agriculture, the staggering ecological and economic benefits are clear. Monocultures increase productivity by prioritizing quick returns rather than the long-term health of the environment. Monocropping is concerned solely with land as a vehicle for food production, instilling a calculated negligence that pushes ecological systems towards failure. As land is finite and resources are dwindling, using available space wisely is necessary in future agricultural systems. Compared to monocultures, restorative agriculture is an infinitely more practical choice for sagacious land owners and those with capital to spend. Food production aside, restorative agriculture also succeeds at generating surplus value via non-edible by-products. (2013) Restoration land management is commonly undertaken by farmers in rural areas with large tracts of land. If implemented on a small scale, restorative agriculture represents a desirable strategy for adapting urban areas to address food insecurity concerns. Consider Bellingham, Washington.

CASE STUDY

On the subdued shores of Puget Sound and under the watchful eye of Mt. Baker, Bellingham is a city of roughly 100,000 inhabitants. The municipal government is actively engaged in coordinating plans to resolve connectivity and environmental issues as a means of sustaining future growth. With an annual budget of \$6,000,000, a local Greenways Committee manages expenditures on parks, recreation, and open space. Goals in the 2022-2026 Strategic Plan primarily address leisure, accessibility, and recreational concerns. The document briefly mentions habitat restoration and increased plantings of trees and undergrowth. Essentially, the intersection of food and land management is virtually untouched as an idea. Overlooking the implementation of urban food production is not a surprise due to understaffing and low pay. Questions of budget and employment aside, language addressing agriculture is absent in Bellingham's Greenways Strategic Plan. In reshaping the urban environment to produce food, a civic consciousness of the benefits of restorative agriculture is a precursor to real change. Without a general understanding of why, how, and where a city can increase food production through restorative land management, nothing will get done. Additionally, zoning ordinances and land use regulations permit little radical action due to their unimaginative and restrictive nature. The challenge of innovation in local food systems is an exercise in overcoming incrementalism. At this point, the Bellingham municipal government must weigh the value of urban food production against the long-term threats of proliferating food insecurity concerns. How can the value of urban agriculture be demonstrated to a city in a way both facilitating and demanding immediate transformation?

As a first step, inventories of potential sites for urban food production must be created. Greenways, open space, park space, brownfields, grass strips, and vacant lots can all be considered valuable. Relevant accompanying information would include site-specific characteristics: soil type, existing vegetation, slope, surrounding urban elements, microclimates, utilities etc. With a detailed citywide map cross-referencing open land and site-specific information, agricultural designs can be tailored to the constraints of the space and the needs of the immediate community. Agricultural designs should try to optimize the productive capabilities of a site. Availability of resources, layering of uses, accessibility of harvests, and intentionality of plantings are development priorities. A comprehensive list of available spaces, a catalog of site-specific plant communities, and an economic analysis comparing long-term profits against the drawbacks of widespread food insecurity are integral to moving forward. As a supplement to the synthesis of economic, ecological, and spatial information, universities and institutions must affirm and expand education on traditional forms of land management. Publicizing the role of people in nature as caretakers is key to altering perspectives on the intrinsic state of socio-ecological interdependence. Fundamentally, the prevailing mindset of a system affects function, outcome, and resilience. Shifting thought paradigms on the importance of indigenous worldviews is crucial in bringing about sustainable urban agriculture. Currently, local food systems solve identifiable food insecurities but rarely contemplate the necessity of climate adaptation. Incorporating traditional insight into land management might ease a city like Bellingham into regarding food production as an urban feature and a form of genuine progression.

How can a species so attuned to environmental alterations hesitate in response to a crisis? Inaction can be attributed to the uncertainty of future conditions and an imbalance of power. Civic diligence and perseverance promise transformation, but barriers to change do exist. In particular, limitations on restorative urban agriculture are primarily due to:

- *Unfamiliarity:*
 - Restorative agriculture has no ostensible influence on city planning and in public discourse. The idea of creating sources of food in urban areas is somewhat foreign. Presently, urban food production is of an entirely separate domain to the private commercial spaces created by planners for food suppliers.
- *Worldview:*
 - Sustainable development draws heavily from traditional ecological knowledge without following basic moral principles governing the right to harvest and the right to destroy. In cities, this cognitive dissonance creates conditions where humans and nature are still treated as separate entities.
- *Resources and Management:*
 - Much like community gardens, restoration agriculture requires materials (Seeds, irrigation, fencing, etc.) and labor. While the long-term design of a restorative agricultural system reduces inputs, getting off the ground requires significant care.

- *Capital:*
 - The economic potential of restoration agriculture undermines capitalist notions of individualism, privatized production, and short-term profit. Capitalism does not willingly subvert itself; actions taken to restore public forms of wealth challenge the status quo.

Fortunately, barriers are meant to be broken; the constraints on agricultural innovation can be overcome in the process of data compilation, community outreach, and communication. Education is a fantastic tool to move the dial on commitment. If universities, governments, and the public understand the nature of long-term food insecurity, then funding, resources, and civic pride may become avenues for success rather than failure.

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Urban food production is not another glamorized term to fill textbooks and open ears in the lecture hall. Restorative agriculture can give people agency. The ability to feed oneself and others is powerful. Without food, the right to self-govern dissolves and peace fragments into isolated communities of resources, materials, and knowledge. My friends, my family, and my people feel powerlessness when contemplating a world where political, economic, and social freedoms rest in the hands of a few. While some may inherit wealth and stature, the great majority of us inherit the Earth. Now is the time to take responsibility for our land, no matter the composition. Cities are one of humanity's greatest and most unnatural achievements, and yet, the natural world abides. Between alleyways and sidewalks lie opportunity. In the grass strips along residential streets, a mirage of hazelnut bushes and chestnut trees flash at a moment's notice. Parts of the city once insignificant are now tinted anew with indigenous wisdom. By intimately tending to the land forgotten by development, municipal governments can physically embody the ethic of caring for their people and their land. Reconnecting culture to place is a worthy goal for cities in the era of climate change, but there is much work to be done.

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