Transforming Global Food Systems: Centering Indigenous Land Returns

Food (in)security is a complex and contested term encompassing multiple domains, measures, and means of investigation and interpretation (Cullather 2010; Pinstrup- Anderson 2009). To effectively understand and begin to address global food insecurity, it is crucial to consider the myriad of interdisciplinary concerns that affect the four pillars of food security (availability, access, utilization, and stability) (IPCC Food Security 2019). Approximately 821 million people are currently undernourished (IPCC Food Security 2019), and 2 billion over-consume (International Food Policy Research Institute 2016 cited in Ritchie and Higgins 2018). If and when Indigenous populations are included in analyses, across these measurements, their food insecurity is frequently reported comparatively higher than non-Indigenous populations (FAO 2013; Huet et al. 2012; Mercille et al. 2012).

We must consider the various entry points for change across the whole of the agriculture and food value chain to ensure avoiding explicit focus on production level adjustments or individualistic assumptions (Alkon & Mares 2012; Ritchie & Higgins 2018; FAO 2001 in IPCC Food Security 2019). Holistic approaches challenge narrow measurements of food and its production concerning the individual, household, or national estimates within this given moment.

Increasing the global percentage of appropriate legal land rightfully recognized and owned by Indigenous and local communities to have respected ratification of country-specific land rights, protection, and sovereignty offers a strategy to improving not only their own food security, but, also, the food security of broader populations. Such a claim is based on the proposed transformatiom of widely discerned discriminatory and harmful systems. Greater land return and recognition towards Indigenous sovereignty is proposed as a specific method to facilitate both tangible and intangible consequences of agroecological-based solutions to global food insecurity.

Agroecological Frameworks

Agroecology efforts advocate for the urgent transformation of the interconnected structures that damage human and non-human environments and exacerbate food insecurity. It is important to highlight land return within this transformation to food systems given overlapping values espoused by holistic, agroecological practices and deep interconnection and respect to the Earth manifested by many Indigenous cultures (González & Kröger 2020; Lugo-Morin 2020; LaDuke 2016). Increasing land sovereignty for Indigenous populations can be a catalyst utilized within a broader movement towards agroecology. Land sovereignty (institutionally recognized ownership) is often overlooked as a vehicle to address shortcomings of current food systems (Resource and Rights Initiative 2015; Kepkiewicz & Dale 2018).

An agroecology framework to address food insecurity suggests evolving knowledge, design, and management of food systems inclusive of interdisciplinary dimensions (Agrifood Atlas 2017; Morris et al. 2016 cited in Anderson 2021). It reciprocally embraces a food sovereignty frame that supports Indigenous communities and farmers' and encompasses sustainable food systems, sensitive to the eco, social, and cultural environment and knowledge (Anderson 2021; Dumont et al. 2016 in IPCC 2019; Morris et al. 2016 cited in Anderson 2021; Kepkiewicz & Dale 2018). An interpretation of agroecology endorses that "the dispute over real and tangible territories and the

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resources… necessarily go hand in hand with the dispute over immaterial territories, or the space of ideology and ideas" (Giraldo & Rosset 2017, p.2). Guided by these principles, agroecology can be considered "much more than a way of producing, [it] is a way of being, understanding, living and feeling this world" (da Silva 2014 cited in Giraldo & Rosset 2017, p. 558).

Strengthening Indigenous food sovereignty within agroecological movements extends solutions to food insecurity beyond material and production-centric approaches. These frames are critical alternatives to dominant models. It instead creates space for truly holistic food systems by Indigenous peoples, and farmers upholding agroecology values necessarily intending to "transform how we produce and consume food into something better for humanity and our Mother Earth" (Declaration of the International Forum for Agroecology at Nyéléni (LVC 2015a) cited in Giraldo & Rosset 2017).

Indigenous Populations and Land Sovereignty

Systemic violence, discrimination, exploitation, and expropriation have left Indigenous communities fighting to maintain and protect more than 50% of the planet's land surface, yet governments recognize ownership rights for only 10% (Land Rights Now 2018). Globally, across a plethora of measurements, data suggests innumerable instances of reportedly higher food insecurity in Indigenous populations compared to non-Indigenous populations (FAO 2013, p19). Some of the effects of securing land rights to Indigenous communities include increased farming productivity by 60%, more than doubled family income, and enabling a foundation for strong social relations as a safety net during crises (Land Rights Now 2018; p5). Some influential international entities recognize that policies, measurements, and instruments shown to be environmentally and food chain effective include recognition of land use regulation and enforcement (Table SPM.7, Summary for Policymakers 2007; p.20). Overall, this suggests that physical and institutional security in the land, rights to resources, adequate livelihoods, and locally focused worldviews are prerequisites for the manifestation of cultures that understand responsibilities with land holistically and practice great respect for the sanctity of the land and food (Giraldo & Rosset 2017, p.2).

Arguably, "Indigenous Peoples' right to food is inseparable from their rights to land, territories, resources, culture, and self-determination" (Cunningham 2013, p. X). Agroecological movements seek to address the shortcomings of current food systems by confronting dominant land and resource use that is entangled in capitalist-driven accumulation structures, colonialist domination, and neo-liberal market boundaries (Harvey 2005; Kepkiewicz & Dale, 2018; LaDuke 2016; Marx 1982; Perfecto et al. 2019; Said 1978).

In sum, these dominant structures formalized inherently violent and destructive methods of systematic land seizure, expropriation, and exploitation that dominated and re-orientated all social systems towards globalization and centralization. With this, Indigenous peoples continue to be structurally separated from their lands; they collectively suffer systemic human rights abuses; and their communities and environments are devastated while being manipulated within the corporate food regime (Alkon & Mares 2012; Balassa 1982; Dunbar- Ortiz 2015; Marx 1982; McMichael 2005; Vorley 2001; Shah 2010; Shiva 2005; Harvey 2005).

Radical and transformative movements that dismantle monopolistic control of power, economy, and resources must drive attempted addresses of food insecurity (Agrifood Atlas 2017; Alkon & Mares 2012; Wittman 2009). Without formal land recognition, corporations and governments that enable destructive land-use practices, unsustainable food systems, and exacerbation of imminent environmental concerns are more likely to control land, food, and livelihood pathways (Walsh 2016).

In this context, Indigenous food sovereignty is intricately interlinked with Indigenous political, social and cultural resurgence, which centers on Indigenous relationships with land (Grey and Patel 2015 cited in Kepkiewicz & Dale, 2018, p1). Such worldviews focused here include land-use practices that promote more than sustainable production from agriculture as a solution to narrow measurements of food insecurity.

Centering land returns within agroecological movements aligns with enabling space for cultural expressions that protect and exemplify holistic ways of life guided by understandings of the land through deep respect, care, and

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interconnectedness (Giraldo & Rosset 2017; González & Kröger 2020; Lugo-Morin 2020; LaDuke 2016). Indigenous lifeways that express responsibility to manifest a harmonious and balanced relationship amongst all human and nonhuman existence dimensions must be respected (Giraldo & Rosset 2017; LaDuke 2016). Endorsing these values enables the self-determination and survival of communities that have successfully nurtured biodiversity, nourished communities through viable food systems, and espoused equal treatment for other ecosystems for generations (Giraldo & Rossett 2017; González & Kröger 2020; LaDuke 2016).

Balancing both human and ecological wellbeing and justice through these spaces can increase availability and accessibility of culturally relevant farmer production and "advocates for communities rights to produce for themselves rather than remain dependent on international commodities markets" (Alkon & Mares 2012, p.1). It promotes self-sufficiency instead of furthering destructive settler views and practices that produce food on Indigenous lands for cash crops or exportation.

Without land sovereignty, Indigenous communities must engage with purchasing foodstuffs and are rendered to a dire situation without resources, land, or foodstuffs and dependent on systems inherently constructed to exploit and exclude them (Alkon & Mares 2012; Kepkiewicz & Dale 2018, p.9). Institutionalizing land rights and ownership for Indigenous People and local communities is an essential mechanism to counteract desolating land management and directs food regimes towards necessarily resolving historical issues of land control: perceptions of Native peoples: and transforming social, cultural, and economic attitudes to managing endangered ecosystems (LaDuke 2016).

Sustainable Intensification: A Technological Future?

Previously emphasized are the inherently competitive, exclusionary, and destructive societal structures that infiltrate everyday material and immaterial aspects of the food regime regulating social order within internationally prevalent capitalist and neoliberalist systems (Del Casino & Jocoy 2008, Stephenson 2003 cited in Alkon & Mares 2012; Harvey 2005; Marx 1982). Recognizing these restricted possibilities offers support for Sustainable Intensification (SI) that endorses technological advancements to utilize the land as a resource within prominent structures efficiently.

SI uses agricultural technologies that consider environmental and social issues that address yield gaps, evaluate environmental concerns, and do not expand further into arable land (Godfray & Garnett 2014). Some consider that with the predicted global population increase (from 7 to 9 billion), the world will need 70-100% more food by 2050 (Godfray 2010; p. 813). In some instances, food production average yields meet 60% potential due to farmers' insufficient capacity to access and use available technologies and management mechanisms (Godfray 2010; p. 813). Closing yield gaps and increasing resource efficiency are necessary strategies towards challenges that could increase environmentally driven supply by 50-90% between 2010 and 2050 (Springmann 2018; p. 519). Combining sustainability and intensification priorities has shown to be effective in low-income countries that demonstrate an increased yield of 79% across various systems and crop types, and in other cases, yield rates doubled (Godfray et al. 2010; p. 814). Research supports that synergistically combining improvements in technologies under a medium ambition target could mitigate environmental pressures by around 25-45 % (IPCC Food Security 2017; Springmann 2018; p. 523).

Overall, SI suggests solutions to food insecurity must be innovative to achieve maximum potential yields. SI methods seek to positively contribute to increasing food supply potentials while also decreasing climate impacts to provide the world with more food. Prioritizing climate impacts of food systems further addresses dimensions of food resilience and long-term solutions to food insecurity (IPCC 2017). Highlighting these contributions proposes SI as a more viable future. It doesn't pose transformation across multiple interlocking systems and instead enables positive progress in food production within boundaries that shape national and international spaces.

Why We Need to Think Holistically

Arguably SI methods focus on the supply and production aspects of food security (IPCC Food Security 2017) and render food security to a concept causally determined by "productivity, yields, and competitiveness based on neoliberal economic and scientific precepts" (Giraldo 2013, p.14). Emphasizing efficiency must not be the

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hierarchized priority. Global food security must be cognizant of a holistic approach. Thus, promoting agroecology and supporting food sovereignty's awareness of the overlapping structures currently inhibiting food security and justice. Indigenous land sovereignty is a tool compatible with these efforts.

Centering food sovereignty to address food security dimensions is situated within the projected increased vulnerability of human and non-human environments and systems (IPCC Food Security 2019; Vermeulen 2014). Overlooking the overlaps between globally prevalent issues will only lead to furthering food, economic, social, and political systems widely recognized as inherently unjust, inefficient, and stimulating national and international disparities and insecurities (Harvey 2005; LaDuke 2016; Lugo-Morin 2020; Marx 1982; Schmitt 1991). The achievements of agroecological methods depict the success of linking "people's worldviews, their forms of symbolic understanding, their relations of reciprocity, and their ways of existing and re-existing to ways of inhabiting the Earth" (Porto-Gonçalvez 2009 cited in Giraldo & Rosset 2018; p.3).

Progress towards food security conscious of environmental sustainability responsibilities maintains that food must be not only grown but also accessible in a manner that "protects, uses and regenerates ecosystem services rather than replacing them" (Ponisio et al. 2015). Coordinated action can address yield gaps (in line with SI targets) while also securing equal recognition to climate change, improving land use, food security, nutrition, and ending hunger (D'Annolfo et al., 2017; Graeub et al. 2016; Maxwell & Wiebe 1998). Innovative technologies posed by SI are bounded by inherently destructive and unjust social systems and are not enough to significantly address food insecurity.

Finally, structurally increasing Indigenous communities' land sovereignty on a global scale promotes inclusion within ideologically transformative conversations advocated by food sovereignty and agroecology. Increasing recognition of land rights and sovereignty inserts a deeper immersion of local knowledge within international frameworks, greater incorporation of tangible farming practices, and the ideological elements of Indigenous cultures under an agroecological umbrella to transform food systems and subsequently affect global food security demands (González & Kröger 2020). Employing this catalyst would provide a necessary tool within the agroecological framework to relieve shortcomings to ensure all (human and non-human elements) are considered within effective and sustainable food security agendas (Charoenratana & Chika 2018). Respecting the effects of overlaps between immaterial and material territories illuminate opportunities for reduced land degradation, increased land productivity, and increased food security (Ghebru & Holden 2013).

Conclusion

As a mechanism to advance agroecology, institutionalized commitments that promote all aspects of land and food security within the same analysis must be strengthened. Frames, such as SI, that address simply the quantity of food produced are inadequate. Food must become a more viable and dependable system for all in current and future scenarios (Igoe 2014; Alkon & Mares 2012). Scaling up formal land recognition for Indigenous communities offers agroecological practices to improve Indigenous populations' food security. Moreover, by addressing both tangible and intangible dimensions of food insecurity through a transformative shift in addressing the complex global crises, there is potential for effects beyond localized human Indigenous food security improvements, guided by more viable, sustainable, and inclusive pathways and values for all.

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