



Is Urban Agriculture a Game Changer or Window Dressing? A Critical Analysis of Its Potential to Disrupt Conventional Agri-food Systems

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Abstract. Is urban agriculture capable of becoming a ‘game changer’, contributing to the sustainable transition of our conventional agri-food systems? Or is it more likely to be ‘window dressing’, characterized by limited participation and influence? The answer depends upon how we measure system change. The value of urban agriculture is often measured in physical – caloric – terms. By assessing the multiple emergent effects of urban agriculture activities through an extensive, in-terdisciplinary literature review, this article provides a more informed context to a discussion of the disruptive potential of urban agriculture. Several features of urban agriculture suggest its potential to be an important contributor to agri-food system transition; however, a number of key challenges must be acknowledged and addressed. Ultimately, producing food in cities is not inherently transformative in and of itself, but the potential and observed new forms of social engagement emerging in many contexts create institutional conditions that can disrupt conventional agri-food systems by building social capital as much as physical capital.

Introduction

Are alternative food practices such as urban agriculture capable of becoming a ‘game changer’, contributing to the sustainable transition of our conventional agri-food systems? Or is it more likely to be a form of urban ‘window dressing’, characterized by limited participation and influence? Many citizens around the globe have been engaged in agri-food practices of multiple forms that lie outside the domains of the conventional, industrial agri-food systems in increasing numbers, in response to food safety risks and concerns about the environmental impacts of industrial agriculture, among other things, while for others such practices constitute preferred cultural and lifestyle patterns both new and longstanding. In still other cases, namely in the developing world, farmers and consumers have never been engaged in that conventional system in the first place.

Urban agriculture is an alternative food practice that has received growing attention in the academy, yet it remains on the sidelines in policy circles, which continue

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to prioritize conventional and neoliberal prescriptions for food security (Kirwan et al., 2013). This marginalization has been further supported by a number of studies, largely in the natural sciences, that express skepticism about the ability of urban agriculture to meet local caloric needs. These critics, however, reduce the analysis of urban agriculture to a form of mono-consequentialism – evaluating urban agriculture's myriad expressions along a single parameter of consequence: calories produced. By assessing the multiple emergent effects of urban agriculture activities through an extensive, interdisciplinary literature review, this article provides a more informed context to this discussion. In conclusion, this analysis suggests that several features of urban agriculture suggest its potential to be an important contributor to agri-food system transition, provided a number of key challenges are acknowledged and addressed.

Concerns about the integrity and sustainability of our conventional agri-food systems are certainly warranted. Many drivers are placing pressure on our relationships with food, including, to begin, the global population: currently at 7.5 billion, it is expected to grow to 9–10 billion by mid-century. Even at 7.5 billion, food security remains an elusive goal. An estimated 795 million people worldwide faced chronic food insecurity in 2015 (FAO, 2015) and, on the other end of the spectrum, poor diets have spawned a health epidemic in the form of overweight and obesity, for approximately 1.9 billion people (WHO, 2015).

A growing proportion of the global population is also moving to cities. Urbanization consumes farmland, while at the same time urban residents become dependent upon long and frequently international food supply chains, which are vulnerable to disasters in locations in which food is produced and processed (Satterthwaite et al., 2010). In one analysis, food-energy deficiencies in the urban areas of 12 out of 18 low-income countries were equal to or higher than in rural areas, despite higher average incomes (Ahmed et al., 2007). Various studies have shown the extent of food insecurity among low-income households in urban areas and the many short-term coping measures taken that compromise health and nutritional status (Maxwell et al., 1998; Tolossa, 2010; de Zeeuw and Dreschel 2015).

Meanwhile, indications are that conventional agriculture will have a hard time meeting increases in demand. To the contrary, we may well see a decline in production, or at least repeated occurrences of large-scale harvest failures, due to climate change. Research suggests climate change has already affected agricultural productivity negatively, with observations of production declines globally up to 2.5%, and projections for the coming decade grow increasingly negative as we progress into the twenty-first century (Porter et al., 2014). The urban poor, with limited ability to adjust to price rises or produce their own food, are at particularly high risk (Viljoen and Wiskerke, 2012). Ironically, the negative impacts of climate change on agrarian regions may drive further increases in urban migration, as small farmers can no longer sustain their rural livelihoods (e.g. Lobell and Burke, 2009), further increasing pressure on cities. Climate change aside, conventional agricultural methods have been shown to be ecologically unsustainable in many ways, including, notably, observations that such methods have stripped soil of its ability to support agricultural crops themselves, on top of their effects on biological diversity, water quality, and greenhouse gas emissions (Foucher et al., 2014). The structure of the global conventional agri-food sector, furthermore – within which an enormous concentration of power has been accorded to the 'corporate middle', consisting of agricultural input firms, processors and retailers (e.g. Weis, 2007) – simply does not lend itself to the

types of institutional feedbacks that would readily foster adaptation.

In other words, our conventional agri-food systems exhibit a lack of resilience to crisis drivers such as climate change, have a number of detrimental ecological and social side effects, and appear to have limited ability to ensure global food security (Almås and Campbell, 2012; Tanentzap et al., 2015), defined at the World Food Summit of 1996 as the physical, social, and economic access to sufficient, safe and nutritious food that meets dietary needs and food preferences for an active and healthy life. As with other socioecological systems, the avoidance of enduring crises may require system transition – a full-scale rethinking and reordering of the structures and practices defining our socio-economic systems (Haxeltine et al., 2008; Lawhon and Murphy, 2012). Sustainability transition theorists postulate a transition is unlikely to consist of a singular revolutionary force, and more likely to consist of multiple causal pathways: emerging actors in different contexts that initiate small-scale activities that disrupt the current system, which then are upscaled to effect broader system change (e.g. Geels and Schot, 2007; Haxeltine et al., 2008). Similarly, according to reflexivity theorist Archer (1995, 2010), structural transition presupposes the congruent occurrence of multiple social interactions that serve to confront existing structures and paradigms. Several alternative agri-food practices serve as disruptions to this dominant system, and may be considered just the sort of small-scale innovations with the potential for upscaling, including urban agriculture (Holt Giménez and Shattuck, 2011).

Introduction to Urban Agriculture

Luc Mougeot (2000, p. 10) describes urban agriculture as:

‘an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re-)using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area.’

According to Smit et al. (1996), an estimated 800 million people practised urban agriculture worldwide at that time of writing (more recent estimates are unavailable). Urban agriculture has been practised for as long as there have been cities, and continues to be a prominent land use in many cities outside of the West, but it declined notably in places like the U.S., Canada, the U.K. and Australia after World War II. Urban agriculture today, however, has experienced a re-emergence of sorts, encompassing a wide diversity of practices, including small-scale and large-scale production in both public and private spaces; subsistence and market-based activities; low-input practices such as traditional garden plots; and technologically intensive practices such as indoor hydroponic production. With the prevalence of small-scale, non-commercial production, and diversity of practice and practitioners, urban agriculture falls outside the spectrum of conventional industrial agri-food systems, and this is here considered a form of alternative food practices.

Sources of Enthusiasm

Many advocates of urban agriculture would agree with the UN High Level Task

Force on the Global Food Crisis (UN, 2009), which identified urban agriculture as a key means of alleviating urban food insecurity and building resilient cities (e.g. Mougeot, 2006; Coelho et al., 2013; Muldoon et al., 2013; Obatolu and Speak, 2013; Orsini et al., 2013; Denis et al., 2015). Recent empirical assessments offer a glimpse of the scale of urban agriculture in practice today. Corbould (2013) estimates urban agriculture contributes 15–30% of global food production currently. According to Satterthwaite et al. (2010), urban and peri-urban agriculture has a significant role in food security in most low-income nations. The participation of poor households in urban agriculture is very high in many cities, particularly in sub-Saharan Africa, providing nutritious fresh produce and other food products directly, and reducing household cash expenditures on food (Gerster-Bentaya, 2015). Some families are also able to supplement their income with the sale of produce, although relatively better-off households tend to benefit to a greater extent (Gerster-Bentaya, 2015). In many cities it is also more difficult for the urban poor to access the necessary land (Smit et al., 2001; Lee-Smith, 2010). Maxwell (1995) found that about 35% of city residents in Kampala, Uganda, engage in some form of agriculture, and non-farming households in Kampala spend one and a half to two times more on food each month. In some parts of South East Asia, as much as 80% of people are involved in urban food production, with 80% of fresh vegetables and 40% of eggs consumed in Hanoi, Vietnam, coming from urban production sites (Corbould, 2013).

In Cuba, well known for its expansive urban agriculture, 50–80% of vegetables consumed are grown on urban farms (Smit et al., 2001), but practices are also quite widespread in other regions, with notable expansions observed in Western countries (Atkinson, 2013). For example, Singapore had over 10 000 urban farms in 1998, producing over 80% of poultry and 25% of vegetables consumed (Smit et al., 2001). Australians produced an estimated 153 000 tonnes of vegetables per year in their home gardens – about 70 kg per household on average (Larder et al., 2014). In the United States, a survey identified more than 9,000 community gardens run by 445 organizations, 39% of which were built in the past five years, and 90% of organizations reported increased demand for plots in that same time frame. A Canadian study estimates that gardeners in Montreal grow as much as 70% of the produce they consume during the 18-week growing season (Duchemin et al., 2008). Other studies highlight the productive intensity of urban gardening. In New York, for example, a sample of 67 gardens produced an average 1.3 pounds, or US\$3 of food per square foot (Gittleman et al., 2012). (By contrast, a typical corn field in Iowa, U.S., produces 2.1 bushels per acre, and given corn prices as of early 2015, that would have generated US\$7.94 per acre.)

Academic research focusing on urban agriculture in the West has also emphasized a host of social and cultural benefits of urban food production (relatively less attention has been paid to food security among studies of urban agriculture in the West). Specific benefits noted include mental and physical health and well-being (Bellows et al., 2003; Beckie and Bogdan, 2010; Litt et al., 2011; Zoellner et al., 2012; Zick et al., 2013; Gray et al., 2014), the cultivation of citizenship (Welsh and MacRae, 1998; DeLind, 2002; Seyfang, 2006), offering the disenfranchised access to the public sphere (Staeheli and Mitchell, 2008), and creating social capital (Firth et al., 2011). Community gardens, furthermore, are seen as a means of creating an ‘urban oasis’ that provides refuge from urban decay while revitalizing city neighbourhoods (Poulsen et al., 2014). Overall, these advocates in toto offer a depiction of urban agriculture that is uncritical, and verges on the overly romantic, offering images of

community gardens single-handedly solving a multitude of social and ecological ills without breaking a sweat.

Some quantitative analyses, conducted primarily at the regional level, make optimistic claims of the productive potential of urban agriculture, such as Grewal and Grewal's (2012) estimate that nearly half of fresh vegetables and all of the poultry and eggs consumed in Cleveland could be produced locally if 80% of all vacant land were put into production; a proviso that may be politically and culturally unrealistic (see also e.g. Dowie, 2010; Macrae et al., 2010; Haberman et al., 2014).

Claims of Critics

Critiques of urban agriculture emanate from both the social and agricultural sciences. Starting with the latter, several analyses gauging the productive potential of urban agriculture at higher scales have provided discouraging results. These studies all employ some variation of quantitative calculation of land availability and population, and estimate the shortfalls in productivity based on average agricultural productive potential and per capita food consumption needs (e.g. Born and Purcell, 2006; Algert et al., 2014; Korth et al., 2014; Martellozzo et al., 2014). Martellozzo et al. (2014), for example, conclude from their global assessment that, assuming the goal of producing 300 grams per capita per day of vegetables (the recommended diet), only nine countries would be able to satisfy this production goal with less than 10% of their land, and 51 countries would have insufficient urban area to meet the recommended diet, even if 100% of available land were employed. Many of these researchers do acknowledge the high degree of uncertainty associated with such large-scale studies, and Korth et al. (2014) have gone on to note that the limits of study designs employed in all such assessments simply do not allow for any conclusions regarding urban agriculture's productive potential. Nonetheless, many of these studies imply that the positive claims of urban agriculture's productive potential are highly overrated, and they are often used to discredit urban agriculture activities.

Among social scientists, two critiques come to the fore. First, several social scientists have argued that urban agriculture and other forms of alternative agri-food practices in vogue today largely represent a white, middle-class pursuit that all too often operates with a market mentality, such as calls to 'vote with your fork' (Guthman, 2003, p. 46; see also Slocum, 2006, 2011; Guthman, 2014; Bradley and Galt, 2014). Because of these exclusionary tendencies, urban agriculture and other food practices do little to confront racial and class inequities, and at their worst can perpetuate them, by promoting food products that are inaccessible both economically and culturally to low-income and ethnic minority communities, and excluding the participation of the members of such communities in urban food production (Lyson, 2014). Participation from people who face real and significant hardship with the conventional food system, contrarily, are the most likely to lack the resources to participate in the first place (Kearns, 1995; Staeheli et al., 2002; Hassanein, 2003; Fyfe, 2005; Ghose and Pettygrove, 2014). Even in the developing world, the benefits of urban agriculture accrue disproportionately to the middle classes (Satterthwaite et al., 2010).

Others have offered rather scathing accounts of urban agriculture's alleged neoliberal leanings. These critics argue that urban agriculture perpetuates a neoliberal rationality by locating solutions to social problems within the market rather than the state (Newman and Lake, 2006; Holt-Giménez and Wang, 2011; Alkon and Mares,

2012), while politics is further obscured by discourses of individual and community 'self-help' mantras (Roberts and Mahtani, 2010). Pudup (2008, p. 1228) suggests that urban gardens are 'designed as spaces in which gardening puts individuals in charge of their own adjustment(s) to economic restructuring and social dislocation', and in effect urban gardens serve to pass on state responsibility for the maintenance of public spaces to local residents (Rosol, 2012). Even well-intentioned initiatives are inclined to become co-opted by the very neoliberal forces they aim to overcome (Guthman, 2007, 2008). Urban food banks and other support organizations, furthermore, have the potential to depoliticize food insecurity and hunger as they gain more power in metropolitan regions (Henderson, 2004; Warshawsky, 2010, 2011). States do indeed assert influence over urban gardens, as Domene and Saurí (2007) argue, by strictly regulating where and how they exist, thus constituting a mechanism by which governments ensure quiescence rather than state confrontation among citizens (Elwood, 2004; Ghose, 2005; Perkins, 2010). Rather than disrupting existing sociopolitical structures, in other words, urban agriculture practitioners only serve to reinforce neoliberal hegemony (Perkins, 2010).

Clean Conjectures Meet Messy Reality

Delving more deeply into the empirical literature reveals that the effects of urban agriculture are far more nuanced than the literature described above would imply, and it is to these nuances that we must pay attention, in order to offer a more robust evaluation of urban agriculture's potential contribution to sustainability transitions in conventional agri-food systems. There are indeed sources of concern, yet there are simultaneously indications of outcomes that offer substantial encouragement, and the unique interactions of both types of drivers in specific regional contexts will shape the future trajectories for urban agriculture.

Reasons for Concern

First, the real source of concern in relation to production is not its general limitations, but rather its specific limitations. The high degree of geographic variation in agronomic conditions, and in the economic and knowledge capacity to adopt advanced technological growing techniques to adapt to those conditions, translates into social inequities in access to urban agriculture in ways that are not immediately determined – although certainly indirectly influenced – by the politics of race and class. Extending the growing season in northern cities, for example, would require access to technologies that significantly increase the required input costs. As another looming concern that also points to a source of inequity, several studies have identified contaminated soil and water in urban production sites. Heavy metals can be introduced into the soil through historic land use, atmospheric deposition from urban combustion emissions or industrial pollutants (Chen et al., 1997; Wei and Yang, 2010), and waste-water usage (Mapanda et al., 2005). Such sites are highly likely to be concentrated in inner-city neighbourhoods, which also tend to house lower-income families.

Second, while limited support for allegations of white dominance beyond the regional context can be found in the extant literature, limited participation among the urban poor does indeed appear to be geographically persistent, and this pat-

tern extends to the developing world (Smit et al., 2001; Lee-Smith, 2010). Even well-intentioned middle-class advocates can unintentionally marginalize the urban poor (and ethnic minorities) through discursive framing that reflects class-situated values and lifestyles (Lyson, 2014).

Security of land tenure is also a concern for all those practicing urban agriculture in public spaces. Many existing sites in the developed and developing world alike are threatened by urban development pressure, which is unlikely to diminish in the coming years of continued rural to urban migration. Perez-Vasquez et al. (2005) note that urban agriculture sites in developing world cities are particularly vulnerable, but development pressure is not limited to the South. Cabannes and Raposo (2013) highlight the plight of primarily immigrant urban farmers in Lisbon, who do not hold any certainty regarding their land-use rights, and their activity can be terminated at any time by political decisions favouring urban development. Even in London, despite being historically recognized and protected, the number of public urban agriculture sites (allotments) has been decreasing (Cabannes and Raposo, 2013).

Those organizations supporting urban agriculture, many of which are relatively new, also exhibit a degree of fragility, in contrast to the entrenched power of local states, which may or may not have the political will and administrative capacity to support urban agriculture. Most urban agriculture support organizations, for example, are dependent upon limited funding, which constrains their long-term viability, and reduces their capacity, especially for political advocacy (Warshawsky, 2014; Drake and Lawson, 2015). According to a survey of community garden organizations across the U.S. and Canada conducted by Drake and Lawson (2015), 80% of small gardens depend upon government for financial support, which accords tremendous influence to local authorities over which forms and expressions of urban agriculture emerge, and which do not (Ernwein, 2014). Regardless of the level of direct financial support, restrictive planning policies and zoning provisions can act as barriers to urban agriculture initiatives (Roehr and Kunigk, 2009; LeJava and Goonan, 2012), even in the form of explicit restrictions on urban agriculture (e.g. Bryld, 2003). In some cases, even sympathetic municipal governments face an uphill battle, having limited institutional capacity for food and agriculture policy, previously the domain of higher levels of government (Pothukuchi and Kaufman, 1999).

Sources of Encouragement

The reasons for concern noted above are indeed formidable, and would require reckoning to allow for expansion of urban agriculture to the level of 'game changer'. There are nonetheless several observable outcomes of current initiatives that offer reasons to believe such an expansion is plausible.

To begin, as noted earlier, a large number of empirical studies identify the direct health and nutritional benefits of urban gardening, notably, among children (e.g. Guitart et al., 2014). But beyond personal health, several studies also suggest that participation in producing food is an entry point for other forms of personal reflexivity (e.g. Veen et al., 2014). Beatley and Newman (2013) note the important role that direct contact with nature in all of its manifestations can play in human well-being, thus encouraging greater integration of 'nature-scapes' like gardens into cities. Such experiences, moreover, create avenues toward greater ecological reflexivity, even when initial motivations to participate have little to do with ecological concern. Experiencing empowerment over one's relationship to food, in its turn, can

also open reflexive space for consideration of other pressing social equity concerns. As observed by White (2011, p. 414), for example, food 'becomes a point of entry to discuss how African Americans might gain control over other aspects of their lives, including, for example, access to affordable housing, clean water and decent public education.'

Collective engagement in food production and processing also creates opportunities for cultural vitalization, and cross-cultural interchange. Whereas social mores prohibit expressions of cross-cultural curiosity and exchange on topics such as religion, family, and politics, food represents a discursive safe space for engagement across cultural divides, and these 'food bridges' are greatly enhanced when such engagements extend to participation in production and processing. Both Gray et al. (2014) and Minkoff-Zern (2014) illuminate how urban gardens bring forth cultural and embodied knowledge that provides immigrant communities connections to their own cultural dietary and agricultural heritage, and connections with neighbours too. Similarly, Taylor and Lovell (2014) note how participation in home gardening among immigrants becomes a means of continuing cultural practices and traditional agroecological knowledge, which in turn offers local food systems unique, culture-specific assemblages of food plants, through the common practice of gifting among home gardeners (which also has tremendous benefits for agro-biodiversity).

Each of these previous two elements describes personal and social benefits of urban agriculture that suggest positive contributions to cities, and which may provide sources of support for their continuation. Other studies, however, suggest a more explicit political potential for urban agriculture to disrupt conventional agri-food systems, despite – or perhaps because of – their sub-political character. Numerous urban agriculture activities, in other words, are instituting changes with notable ramifications for agri-food politics, often in a manner that escapes the purview of those elites that benefit from the current agri-food system. While much attention has been drawn to the support for local foods among the middle classes, Galt et al. (2014) note that alternative food practices often emerge in precisely those marginalized and ghettoized communities that have been abandoned by the state (see also Alkon and Agyeman, 2011). Advocates in New York City, for example, introduced a significant shift in local food retailing with the successful passage of a seemingly minor municipal policy change that enabled the beneficiaries of the federal Supplemental Nutrition Assistance Program (SNAP) (a form of low-income assistance for food purchasing) to use their allowances at farmer's markets (Cohen and Ilieva, 2015). As a result, 132 of New York City's 141 farmer's markets now accept SNAP benefits; annual SNAP purchases at farmer's markets increased from US\$26 000 in 2006 to US\$1 113 893 in 2013 (NYC Food Policy Center, cited in Cohen and Ilieva, 2015); and more than half of the farmer's markets are now located in low-income neighbourhoods (Baronberg and Aycok, cited in Cohen and Ilieva, 2015). McClintock (2014), on the other hand, suggests urban agriculture expresses the potential to inject a moral economy of exchange into local marketplaces, in reference to Oakland's City Slicker Farms' 'pay what you can' pricing mechanisms and similar attempts by urban agriculture food justice advocates to offer affordable local foods. Such initiatives are what Gibson-Graham would call forms of 'new economic becomings – sites where ethical decisions can be made, power can be negotiated, and transformations forged' (cited in Galt et al., 2014, p. 143).

Similarly, Larder et al. (2014) comment upon the contributions to subversive politics that all assertions of food sovereignty represent, even the activities of backyard

gardeners. The grass-roots origin of numerous local organized initiatives is also noteworthy: in a survey of U.S. and Canadian community gardens, Drake and Lawson (2015) found that 81% of the community gardens created in the past five years were initiated 'from the bottom up'.

The fourth and final factor that I consider to offer an important opening for transformational change pertains to the socioecological constitution of agriculture itself. As noted by Galt et al. (2014, p. 136), 'with a bit of land, water, sun, and seed, agriculture/gardening is open to everyone', and the diversity of production systems characterizing urban agriculture look very different from industrial monocultures, expressing the realization of alternative modes of production. While differences in access should not be glossed over, agriculture represents one of a very small handful of political-economic domains that defies complete co-optation under capitalism. After all, it relies on biological and ecological processes that have occurred for millions of years, and have been actively domesticated by humans for 10000 years, processes which capital has not been able to fully co-opt. As (Classens, 2015, p. 235) notes, despite concerted efforts through technological industrialization, within agriculture 'capital(ism) is continually stymied by nature', involving as it does living organisms that require particular periods of growing time, and are perishable. Ultimately, complete control over the means of production is impossible, rendering the production of food in backyards, on rooftops, and avenue medians revolutionary and yet unstoppable affronts to conventional agribusiness.

Window Dressing or Game Changer?

The two most compelling arguments supporting a 'window dressing' future for urban agriculture relate to its agronomic productive potential, and its alleged compatibility with neoliberalism. Neither of these critiques, however, is sufficiently solid to provide a conclusive projection of urban agriculture's future potential. First, claims to the productive limits of urban agriculture tend to be based on quantitative assessments that can only provide the crudest of estimates of productive potential, and fail to acknowledge the role of intensive small-scale practices. The conditions supporting agriculture, and the technologies and agronomic strategies available to increase productivity, are so widely variable that any macro-scale assessment of production on the basis of 'average' productivity is of extremely limited utility. Some cities in northern climates are restricted to 100-day growing seasons, while those closer to the equator can produce 365 days per year, for example. Moreover, small-plot intensive growing practices that include companion planting, vertical growing beds, etc. can greatly increase spatial production intensity. The rapid expansion, furthermore, of advanced technologies enabling indoor production, including high efficiency lighting and hydroponics, offer yet another production breakthrough. To take one extreme example, industrial vertical gardens several stories high can produce an extraordinary volume of food on limited acreage.

As for accusations of neoliberal compliance, as noted by Classens (2015, p. 235), these critics on the whole obliterate the role of agency, and 'both human agency and non-human agency are swallowed up within the cavernous processes of neoliberalization'. McClintok (2013) and others have catalogued the means by which urban agriculture projects challenge the very commodification of food. Urban agriculture transforms urban spaces from their conventional role as a space of consumption to spaces of production (Cabannes and Raposo, 2013). To judge urban agriculture

solely on the basis of its neoliberal or radical tendencies is to diminish its multiple expressions, rationalities, and meanings.

More to the point, both arguments suffer from mono-consequentialism, a form of analysis wholly insufficient for complex systems. Instead, the analysis of multiple drivers and outcomes is called for (Agrawal and Chhatre, 2011). This article has identified formidable challenges to the viability of urban agriculture, including variable agronomic conditions that translate into inequities in access, exclusion of the poor, vulnerability to development pressures, and political weakness among advocacy organizations. On the other hand, there are also several reasons to believe that urban agriculture will at the very least persist, and possibly expand considerably in some regions, offering a vital vector for regional urban sustainability and food security, and agri-food system transition more broadly. These include: its ability to nurture personal and in particular ecological reflexivity; its tendency to build 'food bridges' across cultural groups, thereby potentially reducing ethnic tensions in rapidly growing cities; its numerous forms of disruption through sub-political avenues; and, finally, the very defiance of agriculture to succumb to capitalist rationalities. It is the interaction of these drivers and their evolution over time that will ultimately shape the pathways taken by urban agriculture. As a recent study of urban producers in North America showed, participation in urban agriculture can build community *and* continue to support individualistic consumerism, offer opportunities for reconnecting to nature *and* reinforce the core values of neoliberalism, and the long-term outcomes of such interactions remains to be seen (Mincyte and Dobernig, 2016).

Any expectations that urban agriculture is capable single-handedly of either feeding global urban populations, or revolutionizing the global industrial agribusiness sector will inevitably disappoint. Systemic, paradigmatic change will not arise abruptly as a result of urban agriculture alone. Rather, the system shifts taking place describe an uneven process, with multiple actors and processes involved, leading to emergent outcomes. Food production taking place in cities is not inherently transformative in and of itself. It is the new forms of engagement with the political ecology of the city offered by urban agriculture, and their coincidence with other disruptive forces both within and beyond agri-food systems that are worthy of note, and of further sociological attention.

References

- AGRAWAL, A. and CHHATRE, A. (2011) Against mono-consequentialism: multiple outcomes and their drivers in social-ecological systems, *Global Environmental Change*, 21(1), pp. 1–3.
- AHMED, A.U., HILL, R.V., SMITH, L.C., WIESMANN, D.M. and FRANKENBERGER, T. (2007) *The World's Most Deprived: Characteristics and Causes of Extreme Poverty and Hunger*, 2020 Discussion Paper 43. Washington, DC: International Food Policy Research Institute.
- ALGERT, S.J., BAAMEUR, A. and RENVALL, M.J. (2014) Vegetable output and cost savings of community gardens in San Jose, California, *Journal of the Academy of Nutrition and Dietetics*, 114(7), pp. 1072–1076.
- ALKON, A.H. and AGYEMAN, J. (2011) Introduction: the food movement as polyculture, in: A.H. ALKON and J. AGYEMAN (eds) *Cultivating Food Justice: Race, Class, and Sustainability*. Cambridge, MA: MIT Press, pp. 1–20.
- ALKON, A.H. and MARES, T. (2012) Food sovereignty in US food movements: radical visions and neoliberal constraints, *Agriculture and Human Values*, 29(3), pp. 347–359.
- ALMÁS, R. and CAMPBELL, H. (eds) (2012) *Rethinking Agricultural Policy Regimes: Food Security, Climate Change, and the Future Resilience of Global Agriculture*. Bingley: Emerald Group Publishing.
- ARCHER, M. (1995) *Realist Social Theory: The Morphogenetic Approach*. Cambridge: Cambridge University Press.

- ARCHER, M. (2010) Routine, reflexivity, and realism, *Sociological Theory*, 28(3), pp. 272–303.
- ATKINSON, A. (2013) Urban and peri-urban agriculture: part four: introduction, *City*, 17(3), pp. 361–364.
- BEATLEY, T. and NEWMAN, P. (2013) Biophilic cities are sustainable, resilient cities, *Sustainability*, 5(8), pp. 3328–3345.
- BECKIE, M.A. and BOGDAN, E.A. (2010) Planting roots: urban agriculture for senior immigrants, *Journal of Agriculture, Food Systems and Community Development*, 1(2), pp. 77–89.
- BELLOWS, A.C., BROWN, K. and SMIT, J. (2003) *Health Benefits of Urban Agriculture*. Venice, CA: Community Food Security Coalition.
- BORN, B. and PURCELL, M. (2006) Avoiding the local trap: scale and food systems in planning research, *Journal of Planning Education and Research*, 26(2), pp. 195–207.
- BRADLEY, K. and GALT, R.E. (2014) Practicing food justice at Dig Deep Farms & Produce, East Bay Area, California: self-determination as a guiding value and intersections with foodie logics, *Local Environment*, 19(2), pp. 172–186.
- BRYLD, E. (2003) Potentials, problems, and policy implications for urban agriculture in developing countries, *Agriculture and Human Values*, 20(1), pp. 79–86.
- CABANNES, Y. and RAPOSO, I. (2013) Peri-urban agriculture, social inclusion of migrant population and Right to the City: Practices in Lisbon and London, *City*, 17(2), pp. 235–250.
- CHEN, T.B., WONG, J.W.C., ZHOU, H.Y. and WONG, M.H. (1997) Assessment of trace metal distribution and contamination in surface soils of Hong Kong, *Environmental Pollution*, 96(1), pp. 61–68.
- CLASSENS, M. (2015) The nature of urban gardens: toward a political ecology of urban agriculture, *Agriculture and Human Values*, 32(2), pp. 229–239.
- COELHO, D., GARCIA, M., SALANDINI, M. and BOGUS, C. (2013) Urban agriculture as strategy to promote food and nutrition security, *Annals of Nutrition and Metabolism*, 63(Suppl. 1), p. 1044.
- COHEN, N. and LIEVA, R.T. (2015) Transitioning the food system: a strategic practice management approach for cities, *Environmental Innovation and Societal Transitions*, 17, pp. 199–217.
- CORBOLUD, C. (2013) *Feeding the Cities: Is Urban Agriculture the Future of Food Security?* Dalkeith: Future Directions International.
- DELIND, L.B. (2002) Place, work, and civic agriculture: common fields for cultivation, *Agriculture and Human Values*, 19(3), pp. 217–224.
- DENIS, N., FIOCCO, D. and OPPENHEIMER, J. (2015) *From Liability to Opportunity: How to Build Food Security and Nourish Growth*. Published online <<http://www.mckinsey.com/industries/chemicals/our-insights/from-liability-to-opportunity-how-to-build-food-security-and-nourish-growth>>..
- DE ZEEUW, H. and DRESCHEL, P. (2015) *Cities and Agriculture: Developing Resilient Urban Food Systems*. Abingdon: Routledge.
- DOMENE, E. and SAURÍ, D. (2007) Urbanization and class-produced natures: vegetable gardens in the Barcelona Metropolitan Region, *Geoforum*, 38(2), pp. 287–298.
- DOWIE, M. (2010) *Food among the Ruins: Should Detroit Be Converted into a Farming Mecca?* Published online: <http://www.alternet.org/story/146667/food_among_the_ruins%3A_should_detroit_be_converted_into_a_farming_mecca>.
- DRAKE, L. and LAWSON, L.J. (2015) Results of a US and Canada community garden survey: shared challenges in garden management amid diverse geographical and organizational contexts, *Agriculture and Human Values*, 32(2), pp. 241–254.
- DUCHEMIN, E., WEGMULLER, F. and LEGAULT, A.M. (2008) Urban agriculture: multi-dimensional tools for social development in poor neighbourhoods, *Field Actions Science Reports*, 1(1), pp. 43–52.
- ELWOOD, S. (2004) Partnerships and participation: reconfiguring urban governance in different state contexts, *Urban Geography*, 25(8), pp. 755–770.
- ERNWEIN, M. (2014) Framing urban gardening and agriculture: on space, scale and the public, *Geoforum*, 56, pp. 77–86.
- FAO (FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS) (2015) *The State of Food Insecurity in the World 2015*. Published online <<http://www.fao.org/3/a-i4646e/index.html>>.
- FIRTH, C., MAYE, D. and PEARSON, D. (2011) Developing ‘community’ in community gardens, *Local Environment*, 16(6), pp. 555–568.
- FOUCHER, A., SALVADOR-BLANES, S., EVRRARD, O., SIMONNEAU, A., CHAPRON, E., COURP, T., CERDAN, O., LEFÈVRE, I., ADRIAENSEN, H., LECOMPTE, F. and DESMET, M. (2015) Increase in soil erosion after agricultural intensification: evidence from a lowland basin in France, *Anthropocene*, 7, pp. 30–41.
- FYFE, N.R. (2005) Making space for ‘neo-communitarianism’? The third sector, state, and civil society in the UK, *Antipode*, 37(3), pp. 536–556.
- GALT, R.E., GRAY, L.C. and HURLEY, P. (2014) Subversive and interstitial food spaces: transforming selves, societies, and society–environment relations through urban agriculture and foraging, *Local Environment*, 19(2), pp. 133–146.
- GEELS, F.W. and SCHOT, J. (2007) Typology of sociotechnical transition pathways, *Research Policy*, 36(3), pp.

- 399–417.
- GERSTER-BENTAYA, M. (2015) Urban agriculture's contribution to urban food security and nutrition, in: H. DE ZEEUW and P. DRESCHER (2015) *Cities and Agriculture: Developing Resilient Urban Food Systems*. Abingdon: Routledge, pp. 139–161.
- GHOSE, R. (2005) The complexities of citizen participation through collaborative governance, *Space and Polity*, 9(1), pp. 61–75.
- GHOSE, R. and PETTYGROVE, M. (2014) Urban community gardens as spaces of citizenship, *Antipode*, 46(4), pp. 1092–1112.
- GITTLEMAN, M., JORDAN, K. and BRELSFORD, E. (2012) Using citizen science to quantify community garden crop yields, *Cities and the Environment (CATE)*, 5(1), art. 4.
- GRAY, L., GUZMAN, P., GLOWA, K.M. and DREVNO, A.G. (2014) Can home gardens scale up into movements for social change? The role of home gardens in providing food security and community change in San Jose, California, *Local Environment*, 19(2), pp. 187–203.
- GREWAL, S.S. and GREWAL, P.S. (2012) Can cities become self-reliant in food?, *Cities*, 29(1), pp. 1–11.
- GUITART, D.A., PICKERING, C.M. and BYRNE, J.A. (2014) Color me healthy: Food diversity in school community gardens in two rapidly urbanising Australian cities, *Health and Place*, 26, pp. 110–117.
- GUTHMAN, J. (2003) Fast food/organic food: reflexive tastes and the making of 'yuppie chow', *Social and Cultural Geography*, 4(1), pp. 45–58.
- GUTHMAN, J. (2007) The Polanyian way? Voluntary food labels as neoliberal governance, *Antipode*, 39(3), pp. 456–478.
- GUTHMAN, J. (2008) Neoliberalism and the making of food politics in California, *Geoforum*, 39(3), pp. 1171–1183.
- GUTHMAN, J. (2014) Doing justice to bodies? Reflections on food justice, race, and biology, *Antipode*, 46(5), pp. 1153–1171.
- HABERMAN, D., GILLIES, L., CANTER, A., RINNER, V., PANCAZI, L. and MARTELLOZZO, F. (2014) The potential of urban agriculture in Montréal: a quantitative assessment, *ISPRS International Journal of Geo-Information*, 3(3), pp. 1101–1117.
- HASSANEIN, N. (2003) Practicing food democracy: a pragmatic politics of transformation, *Journal of Rural Studies*, 19(1), pp. 77–86.
- HAXELTINE, A., WHITMARSH, L., BERGMAN, N., ROTMANS, J., SCHILPEROORD, M. and KÖHLER, J. (2008) A conceptual framework for transition modeling, *International Journal of Innovation and Sustainable Development*, 3(1–2), pp. 93–114.
- HENDERSON, G. (2004) 'Free' food, the local production of worth, and the circuit of de-commodification: a value theory of the surplus, *Environment and Planning D: Society and Space*, 22(4), pp. 485–512.
- HOLT-GIMÉNEZ, E. and SHATTUCK, A. (2011) Food crises, food regimes and food movements: rumblings of reform or tides of transformation?, *Journal of Peasant Studies*, 38(1), pp. 109–144.
- HOLT-GIMÉNEZ, E. and WANG, Y. (2011) Reform or transform? The pivotal role of food justice in the U.S. food movement, *Race/Ethnicity: Multidisciplinary Global Contexts*, 5(1), pp. 83–102.
- KEARNS, A. (1995) Active citizenship and local governance: political and geographical dimensions, *Political Geography*, 14(2), pp. 155–175.
- KIRWAN, J., ILBERY, B., MAYE, D. and CAREY, J. (2013) Grassroots social innovations and food localisation: an investigation of the Local Food programme in England, *Global Environmental Change*, 23(5), pp. 830–837.
- KORTH, M., STEWART, R., LANGER, L., MADINGA, N., DA SILVA, N. R., ZARANYIKA, H., VAN ROOYEN, C. and DE WET, T. (2014) What are the impacts of urban agriculture programs on food security in low and middle-income countries: a systematic review, *Environmental Evidence*, 2, art. 7.
- LARDER, N., LYONS, K. and WOOLCOCK, G. (2014) Enacting food sovereignty: values and meanings in the act of domestic food production in urban Australia, *Local Environment*, 19(1), pp. 56–76.
- LAWHON, M. and MURPHY, J.T. (2012) Socio-technical regimes and sustainability transitions: Insights from political ecology, *Progress in Human Geography*, 36(3), pp. 354–378.
- LEE-SMITH, D. (2010) Cities feeding people: an update on urban agriculture in equatorial Africa, *Environment and Urbanization*, 22(2), pp. 483–499.
- LEJAVA, J.P. and GOONAN, M.J. (2012) Cultivating urban agriculture: addressing land use barriers to gardening and farming in cities, *Real Estate Law Journal*, 41(Fall), pp. 216–245.
- LITT, J.S., SOOBADER, M.-J., TURBIN, M.S., HALE, J.W., BUCHENAU, M. and MARSHALL, J.A. (2011) The influence of social involvement, neighborhood aesthetics, and community garden participation on fruit and vegetable consumption, *American Journal of Public Health*, 101(8), pp. 1466–1473.
- LOBELL, D.B. and BURKE, M. (eds) (2009) *Climate Change and Food Security: Adapting Agriculture to a Warmer World*. Dordrecht: Springer.
- LYSON, H.C. (2014) Social structural location and vocabularies of participation: fostering a collective identity in urban agriculture activism, *Rural Sociology*, 79(3), pp. 310–335.

- MACRAE, R., GALLANT, E., PATEL, S., MICHALAK, M., BUNCH, M. and SCHAFFNER, S. (2010) Could Toronto provide 10% of its fresh vegetable requirements from within its own boundaries? Matching consumption requirements with growing spaces, *Journal of Agriculture, Food Systems, and Community Development*, 1(2), pp. 105–127.
- MAPANDA, F., MANGWAYANA, E.N., NYAMANGARA, J. and GILLER, K.E. (2005) The effect of long-term irrigation using wastewater on heavy metal contents of soils under vegetables in Harare, Zimbabwe, *Agriculture, Ecosystems and Environment*, 107(2), pp. 151–165.
- MARTELLOZZO, F., LANDRY, J.S., PLOUFFE, D., SEUFERT, V., ROWHANI, P. and RAMANKUTTY, N. (2014) Urban agriculture: a global analysis of the space constraint to meet urban vegetable demand, *Environmental Research Letters*, 9(6), art. 064025.
- MAXWELL, D., LEVIN, C., ARMAR-KLEMESU, M., RUEL, M., MORRIS, S. and AHIADKEKE, C. (1998) *Urban Livelihoods and Food and Nutrition Security in Greater Accra, Ghana*. Washington, DC: International Food Policy Research Institute.
- MCCCLINTOK, N. (2013). Radical, reformist, and garden-variety neoliberal: coming to terms with urban agriculture's contradictions, *Local Environment*, 19(2), pp. 147–171.
- MINCYTE, D. and DOBERNIG, K. (2016) Urban farming in the North American metropolis: rethinking work and distance in alternative food networks, *Environment and Planning A*, 48(9), pp. 1767–1786.
- MINKOFF-ZERN, L.-A. (2014) Knowing 'good food': immigrant knowledge and the racial politics of farmworker food insecurity, *Antipode*, 46(5), pp. 1190–1204.
- MOUGEOT, L. (2000) *Urban Agriculture: Definition, Presence and Potentials and Risks*, Thematic Paper 1. Ottawa: International Development Research Centre.
- MOUGEOT, L.J.A. (ed.) (2006) *Agropolis: The Social, Political, and Environmental Dimensions of Urban Agriculture*. Ottawa: International Development Research Centre.
- MULDOON, M.F., TAYLOR, A.K., RICHMAN, N. and FISK, J. (2013) *Innovations in Local Food Enterprise: Fresh Ideas for Practitioners, Investors, and Policymakers for a Just and Profitable Food System*. Arlington, VA: Wallace Center at Winrock International.
- NEWMAN, K. and LAKE, R.W. (2006) Democracy, bureaucracy and difference in US community development politics since 1968, *Progress in Human Geography*, 30(1), pp. 44–61.
- OBATOLU, V. and SPEAK, S. (2013) Urban agriculture as a stimulus to urban planning in developing cities for sustainable food and nutrition security, *Annals of Nutrition and Metabolism*, 63(1), p. 1020.
- ORSINI, F., KAHANE, R., NONO-WOMDIM, R. and GIANQUINTO, G. (2013) Urban agriculture in the developing world: a review, *Agronomy for Sustainable Development*, 33(4), pp. 695–720.
- PEREZ-VAZQUEZ, A., ANDERSON, S. and ROGERS, A.W. (2005) Assessing benefits from allotments as a component of urban agriculture in England, in: L.J.A. MOUGEOT (ed.) *Agropolis: The Social, Political and Environmental Dimensions of Urban Agriculture*. London: Earthscan and the International Development Research Centre, pp. 239–266.
- PERKINS, H.A. (2010) Green spaces of self-interest within shared urban governance, *Geography Compass*, 4(3), pp. 255–268.
- PORTER, J.R., XIE, L., CHALLINOR, A.J., COCHRANE, K., HOWDEN, S.M., IQBAL, M.M., LOBELL, D.B. and TRAVASSO, M.I. (2014) Food security and food production systems, in: FIELD, C.B., BARROS, V.R., DOKKEN, D.J., MACH, K.J., MASTRANDREA, M.D., BILIR, T.E., CHATTERJEE, M., EBI, K.L., ESTRADA, Y.O., GENOVA, R.C., GIRMA, B., KISSEL, E.S., LEVY, A.N., MACCRACKEN, S., MASTRANDREA, P.R. and WHITE, L.L. (eds) *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press, pp. 485–533.
- POTHUKUCHI, K. and KAUFMAN, J.L. (1999) Placing the food system on the urban agenda: the role of municipal institutions in food systems planning, *Agriculture and Human Values*, 16(2), pp. 213–224.
- POULSEN, M.N., HULLAND, K.R., GULAS, C.A., PHAM, H., DALGLISH, S.L., WILKINSON, R.K. and WINCH, P.J. (2014) Growing an urban oasis: a qualitative study of the perceived benefits of community gardening in Baltimore, Maryland, *Culture, Agriculture, Food and Environment*, 36(2), pp. 69–82.
- PUDUP, M.B. (2008) It takes a garden: cultivating citizen-subjects in organized garden projects, *Geoforum*, 39(3), pp. 1228–1240.
- ROBERTS, D.J. and MAHTANI, M. (2010) Neoliberalizing race, racing neoliberalism: placing 'race' in neoliberal discourses, *Antipode*, 42(2), pp. 248–257.
- ROEHR, D. and KUNIGK, I. (2009) Metro Vancouver: designing for urban food production, *Berkeley Planning Journal*, 22(1), pp. 61–70.
- ROSOL, M. (2012) Community volunteering as neoliberal strategy? Green space production in Berlin, *Antipode*, 44(1), pp. 239–257.
- SATTERTHWAITE, D., MCGRANAHAN, G. and TACOLI, C. (2010) Urbanization and its implications for food and farming, *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 365(1554), pp. 2809–2820.

- SEYFANG, G. (2006) Ecological citizenship and sustainable consumption: examining local organic food networks, *Journal of Rural Studies*, 22(4), pp. 383–395.
- SLOCUM, R. (2006) Anti-racist practice and the work of community food organizations, *Antipode*, 38(2), pp. 327–349.
- SLOCUM, R. (2011) Race in the study of food, *Progress in Human Geography*, 35(3), pp. 303–327.
- SMIT, J., NASR, J. and RATTA, A. (2001) *Urban Agriculture: Food, Jobs and Sustainable Cities*. New York: United Nations Development Programme.
- STAEHEL, L.A. and MITCHELL, D. (2008) *The People's Property? Power, Politics, and the Public*. London: Routledge.
- STAEHEL, L.A., MITCHELL, D. and GIBSON, K. (2002) Conflicting rights to the city in New York's community gardens, *GeoJournal*, 58(2–3), pp. 197–205.
- TANENTZAP, A.J., LAMB, A., WALKER, S. and FARMER, A. (2015) Resolving conflicts between agriculture and the natural environment, *PLoS Biol*, 13(9), art. e1002242.
- TAYLOR, J.R. and LOVELL, S.T. (2014) Urban home food gardens in the Global North: research traditions and future directions, *Agriculture and Human Values*, 31(2), pp. 285–305.
- TOLOSSA, D. (2010) Some realities of the urban poor and their food security situations: a case study of Berta Gibi and Gemechu Safar in the city of Addis Ababa, Ethiopia, *Environment and Urbanization*, 22(1), pp. 179–198.
- UN (UNITED NATIONS) (2009) *High Level Task Force on the Global Food Crisis*. Published online <<http://un-foodsecurity.org/node/135>>.
- VEEN, E.J., DERKZEN, P. and VISSER, A.J. (2014) Shopping versus growing: food acquisition habits of Dutch urban gardeners, *Food and Foodways*, 22(4), pp. 268–299.
- VILJOEN, A. and WISKERKE, J.S.C. (eds) (2012) *Sustainable Food Planning: Evolving Theory and Practice*. Wageningen: Wageningen Academic Publishers.
- WARSHAWSKY, D.N. (2010) New power relations served here: the growth of food banking in Chicago, *Geoforum*, 41(5), pp. 763–775.
- WARSHAWSKY, D.N. (2011) Food Bank Johannesburg, state, and civil society organizations in post-apartheid Johannesburg, *Journal of Southern African Studies*, 37(4), pp. 809–829.
- WARSHAWSKY, D.N. (2014) Civil society and urban food insecurity: analyzing the roles of local food organizations in Johannesburg, *Urban Geography*, 35(1), pp. 109–132.
- WEI, B. and YANG, L. (2010) A review of heavy metal contaminations in urban soils, urban road dusts and agricultural soils from China, *Microchemical Journal*, 94(2), pp. 99–107.
- WEIS, A.J. (2007) *The Global Food Economy: The Battle for the Future of Farming*. London: Zed Books.
- WELSH, J. and MACRAE, R. (1998) Food citizenship and community food security: lessons from Toronto, Canada, *Canadian Journal of Development Studies/Revue canadienne d'études du développement*, 19(4), pp. 237–255.
- WHITE, M.M. (2011) Sisters of the soil: urban gardening as resistance in Detroit, *Race/Ethnicity: Multidisciplinary Global Contexts*, 5(1), pp. 13–28.
- WHO (WORLD HEALTH ORGANIZATION) (2015) *Obesity and Overweight*, Fact Sheet No. 311. Published online <<http://www.who.int/mediacentre/factsheets/fs311/en/>>.
- ZICK, C.D., SMITH, K.R., KOWALESKI-JONES, L., UNO, C. and MERRILL, B.J. (2013) Harvesting more than vegetables: the potential weight control benefits of community gardening, *American Journal of Public Health*, 103(6), pp. 1110–1115.
- ZOELLNER, J., ZANKO, A., PRICE, B., BONNER, J. and HILL, J.L. (2012) Exploring community gardens in a health disparate population: findings from a mixed methods pilot study, *Progress in Community Health Partnerships: Research, Education, and Action*, 6(2), pp. 153–165.



Managing Flexibility and Expectations: Gendered Experiences of Spatial-temporal Relations in Swedish Family-based Dairy Farming

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Abstract. In recent decades, the Swedish agricultural sector has been reshaped by economic change and the restructuring of the labour market, but it is still dominated by family farms dependent on the labour and time of family members. To date, the concept of temporality and time has attracted limited attention within rural sociological research. Through interviews with couples on dairy farms, this study explored the potentialities in temporal analysis of family farm relations. It sought to open up ways of thinking and conceptualizing gendered and class-based time and division of work in farming. The results show an interconnection between the spatial-temporal organization, social relations, control, property and power of the labour process. The gendered division of labour on the farm, in the household and across different spheres produces a specific set of spatial-temporal relations that manifests itself in the differing experiences of everyday world, time, space and responsibilities between farming husbands and wives.

Introduction

In Sweden, family farming occupies a dominant position in agricultural production, and family labour still constitutes an essential resource on many farms (Andersson and Lundqvist, 2016). In recent decades, family farms have been reshaped by economic change and the agricultural sector has been restructured through growing commercialization, capitalization and technologization (Schwarzweiler and Davidson, 2000; Bock, 2006; Pini and Leach, 2011). Moreover, the need for finding new ways to develop production and profitability has contributed to diversification of the agricultural sector and reorganization of the family farm. Farmers have engaged in various adaptation strategies in order to reproduce the farm, resulting in renegotiation of the direction and organization of the family farm (Evans and Ilbery, 1993; Barlett et al., 1999; Kinsella et al., 2000; Brandth and Haugen, 2011). Today, a smaller proportion of family farms are able to provide work and income for the extended family (Blekesaune, 1996; Djurfeldt and Gooch, 2002; Bjørkhaug and Blekesaune, 2008; Andersson and Lidestav, 2014). Studies on the contribution of off-farm income through wage labour underline the flexibility of women's labour (Deseran

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and Simpkins, 1991; Bryden et al., 1993; Blekesaune, 1996; Kelly and Shortall, 2002). However, in the Swedish context little emphasis has been placed on understanding these shifts and their social implications. In international agrarian and rural studies too, few efforts have been made to transcend traditional concepts of labour and work in capturing and understanding these changes. For example, the concept of temporality and time in relation to agriculture has attracted only limited attention in previous rural sociological research (Busch, 1989; Lockie, 2006; Panelli, 2007; Gill, 2013).

The concept of temporality constitutes a powerful tool for capturing the everyday processes of family farming and for scrutinizing its gendered practices, value systems and division of labour that goes beyond the farm gate (Price and Evans, 2009). Over time, many of these processes have become materialized in the battle for property within the family enterprise (Friedmann, 1986) and embodied in the intersection between agrarian identities and spaces (Bryant, 2001; Saugeres, 2002; Little, 2003; Little and Leyshon, 2003; Brandth, 2006; Price, 2010a). Farm work constitutes a node in agrarian relations and is a central feature in the processes of socialization and inheritance (Price, 2010a), which over time can ensure, for instance, access to property (Flygare, 1999, 2001; Lidestav, 2010). In this context, the gendered division of labour is filled with meaning and implications and becomes central in the construction of subjectivities and the articulation of power (O'Hara, 1998; Shortall, 1999; Burton and Wilson, 2006; Price, 2010a). Therefore, the case of agriculture, and family farming in particular, offers important insights into flexibility in the labour process, both paid and unpaid, and the structuring of time in the public and domestic spheres. The integration of home and workplace also creates a need to study the intersection between gendered and class-based relations of time in the agricultural context. Situating the family farm within these conditions and relations opens the way for a more general theoretical and empirical contribution to the understanding of time, temporality, spatiality and the labour process, thereby contributing to efforts to theorize, for example, the processes of the knowledge economy (Thompson et al., 2001; Warhurst and Thompson, 2006) and the implications of new technologies on the labour process on dairy farms (e.g. Butler et al., 2012; Jacobs and Siegford, 2012; Holloway et al., 2014a; Hansen and Jervell, 2015).

From a narrative approach, the present study was based in men's and women's lived experiences of 'the family farming way of life' (Price and Evans, 2009). The aim was to investigate the temporalities of Swedish family farming, i.e. its spatial and social relations in the farm labour process, and thereby to contribute to the work of understanding gendered, classed and embodied subjectivities in agriculture and in the rural context (Little and Leyshon, 2003; Brandth and Haugen, 2005; Brandth, 2006; Bryant and Pini, 2011) with the help of a temporal perspective (Glucksmann, 1998, 2000). The intention was not to propose the temporal perspective as a new tool within rural studies or to substitute it for other perspectives, but rather to explore its potentialities in the social analysis of family-farm relations and to open up ways of thinking and conceptualizing gendered and classed time and division of work in agriculture. In its ambition to transcend the traditional concept of work, this study sought to provide fruitful insights into the lived realities and structuring of the agrarian labour process. In understanding inequalities as an integral part of production (Acker, 1990; Tomaskovic-Devey, 1993), the labour process provides conceptual space to examine the reproduction of gender and class-based inequalities in family farming through the everyday world. It also provides the tools to scrutinize and dis-

cuss the sorting of temporalities in terms of exploitation, power, consent and resistance within a wider theoretical framework. The Swedish context offers a specific set of spatio-temporal relations to this case study (Gunnerud Berg and Forsberg, 2003) and situates it within both the welfare state and a long political tradition of gender equality (Jordbruksdepartementet, 2004).

Temporality and the Labour Process

The social relations of family farming and agriculture are highly reproduced through work and the labour process. The structuring of these social relations, through the division of labour, is based on acknowledging and valuing certain skills, knowledge, technologies and types of work (Phillips and Taylor, 1980, p. 79; Bradley, 1986; Acker, 1990, p. 146; Glucksmann, 1990; Cockburn, 1991). Because farm work is synonymous with the work men do, women's unpaid housework (e.g. Oakley, 1972) and farm work (Hill, 1981; Sachs, 1983; Reimer, 1986) becomes less important and less likely to be recognized as work. These relations are reinforced by the spatial subordination of the reproductive sphere in relation to the productive sphere in family farming (Flygare, 1999, p. 219). With the decline in manufacturing jobs in the West, the service, finance and knowledge-intensive industries have contributed to a shift in the definitions of work, time and skills (Glucksmann, 2009). In agriculture, various forms of diversification have introduced and normalized new skill sets and knowledge (e.g. Pini, 2005; Brandth and Haugen, 2011; Grubbström et al., 2014). However, the gendered implications and effects on power relations of these shifts have been debated (e.g. Thompson et al., 2001; Andersson and Lidestav, 2014).

Based on the individual experiences of socio-economic relations on household level and an analytical ambition to transcend the dual dichotomies of paid/unpaid labour and public/private, feminist scholars have adapted a more expansive and inclusive definition of work (Glucksmann, 1998, 2000; McKie et al., 2002). Treating all labour undertaken as work, irrespective of where, how and by whom, allows a fuller analysis of the interconnections between paid on- and off-farm employment, unpaid domestic work and other types of care, grocery shopping and community work (Glucksmann, 1998). The adoption of a temporal perspective on the organization of family farming and the agrarian labour process facilitates exploration of the differing modes of interconnection between work activities and modalities of life. It also provides an insight into the reproduction of inequalities and the processes of exploitation.

Temporality is defined as 'an element of all social relationships, processes and structures, an integral aspect that is both constitutive of them and constituted by them' (Glucksmann, 2000, p. 108). Latour (1993, p. 75) emphasizes that 'temporality, in itself, has nothing temporal about it. It is a means of connecting entities and filing them away. If we change the classification principle, we get a different temporality on the same events.' Following Glucksmann (2000), the term temporality is used here to denote the distinctive structure of time. In the same way, Latour (1993, p. 76) states that 'it's the sorting that makes the time, not the time that makes the sorting' and points out how the structuring of time is situated in historical contexts and interconnected with other forces. This makes the number of different ways to structure time almost endless, with clock time as one specific form of temporality. In the social and political landscape, the family farm is located in the interconnection between a variety of temporalities and material and social relations. Time constitutes an inte-

gral dimension of power in social relations. In the structuring or disposition of time, different groups have unequal control and possibilities to manage time based on their subject positions. This unequal relation also produces a specific set of conflicts and clashes between different temporalities. The levels of control are interconnected in different ways with the exposure of bodies to external forces, i.e. psychosocial pressure, risks and hazards in agriculture (Andersson and Lundqvist, 2014).

Flexibility constitutes an integral aspect of different temporalities and is structured through the division of labour. Flexibility, as a form of structuring time and labour, is relational to other types of work. In a number of contexts, this relation is manifested in the perception of women's labour as more 'flexible' (Walby, 1989; Glucksmann and Nolan, 2007), resulting in a specific structuring of women's time and labour in relation to, for instance, care, household provisioning and domestic labour. The exchange of time, both within and outside the monetary dimension, takes place in a setting based on social relations and may therefore be unequal and contain elements of exploitation (Glucksmann, 1998).

Scott (1992, p. 25) points out that 'it is not individuals who have experience, but subjects who are constituted through experience' of an everyday world that is temporally and spatially situated (Heidegger, 1977). In this way, time and space are embodied (Adam, 2003) and the gendered socio-economic relations and division of labour produce a sexually specific embodiment of subjects (Grosz, 1995). Due to this, the experiences of farming couples differ with respect to temporality, the temporal and spatial structure of work/time, how flexibility is managed across different socio-economic modes, remuneration basis (paid or unpaid, market or non-market, formal or informal) and sphere (public and private). However, it is important to emphasize that time and space are co-constructed (D. Harvey, 1990) and therefore not separable (Crang, 2005). As emphasized by Lefebvre (1991), social relations are both constituted in space and of space. Therefore, temporality should be conceptualized together with spatiality (Massey, 2005, p. 89). In the case of agriculture, the premise that place matters (MacDonald et al., 2005; Pini and Leach, 2011) has a dual meaning, reflecting the spatial and natural conditions of farming (D. Harvey, 2006; Bernstein, 2010, p. 89–90). For example, the spatio-temporal situation of family farms, which are often inherited by the husband and located outside urban centres (far from public services), involves specific processes of subjectification and shapes patrilocal relations.

Based on the central themes of the theoretical framework presented above, five factors of the spatio-temporal organization of the labour process were developed based on the deductive as well as inductive coding of material collected in this study. As an example, matters of time management and expectations were emphasized by the interviewees. The analysis of the labour process was structured based on the five factors: *time management* concerns control of the disposal of time; *flexible times* describes the flexibility in different parts of the labour process; *division of labour* comprises the distribution of different work tasks; *structuring of time* concerns how different actors and aspects structure and control the temporalities of agriculture; and *different temporalities and expectations* include the consequences and effects of clashes between different temporalities.

Case Study and Method

The majority of the Swedish landscape is covered with productive forest, leaving a

small proportion of farmland (SKS, 2013). Along with its two northern neighbours, Sweden is among Europe's least densely populated countries. Dairy farming is conducted all over the country and has a long and significant history, especially in the mechanization of Swedish farming in the beginning of the twentieth century (Olsson, 1994). The long tradition of milk production has led to Sweden having the highest average yield per cow in Europe. Today, milk constitutes the largest income-producing agricultural activity and much of farming in the Swedish countryside is dependent on milk production, e.g. in northern regions 84% of full-time farmers are involved in dairy farming (Nilsson and Barnheim, 2000, p. 330–331). The northern context of Swedish dairy farming also exaggerates the impact of agroecological processes in terms of e.g. environment, soil and animals. In general, Swedish agriculture has undergone great changes in the past decade, with the number of farms having decreased by nearly one-third since the early 1990s (SCB, 2011a, p. 12), but continues to be important for local society (Morell, 2011; SCB, 2011b, p. 94). On a global scale, the number of dairy producers is decreasing, while herd size continues to increase (Doupbrate et al., 2013). In Sweden, the number of dairy farm businesses has decreased by roughly 6–8% per year in recent years, and by 2011 there were 5,341 dairy farms left in Sweden (Svensk Mjök, 2012a).

Due to this, the choice of dairy farming as a case places this study within a specific set of social, material, temporal and spatial relations based on historical processes, environments and traditions. Dairy farming is also labour intensive and milk is unique as an agricultural commodity, because it is produced daily all year round (Doupbrate et al., 2013). On the farm, dairy production is often combined with other farm activities, such as cereal and forage production and on-farm feed processing.

Understanding the rural community is of great importance in the process of understanding social divisions (Little, 1994). The farms in this case study are situated within a restricted area of the county of Västra Götaland, at similar distances from large cities. The county contains 20% of all farm businesses in Sweden (SCB, 2011a, pp. 398, 400, 402) and is the largest milk producer, supplying one-sixth of total milk production in Sweden (Svensk Mjök, 2012b). The county is located in the plains region of south-western Sweden and has 1.5 million inhabitants. A mixed and emergent sampling strategy, incorporating purposive and snowball approaches, was used to collect data for the present study. The farms were sampled from register data based on maximal variation within the geographical area. The primary criteria applied in the case study were: 1. couples involved in dairy farming and 2. both partners participating in farm work. To provide a diverse population, the strategically sampled farms were distributed on the scale of secondary sampling criteria, which were farm size, sex of the operations manager, form of land tenure (mainly self-owned or leased) and labour (only family or hired). A total of 16 face-to-face interviews were conducted with eight heterosexual farming couples in their homes. The interviewees were aged between 36 and 65 years and were all parents, three of them with young children. The partners were interviewed separately. The interviews, which were semi-structured and lasted about an hour, were conducted in Swedish, digitally recorded and transcribed verbatim. The quotes in the text below are the author's translation. The aim of the interviews was to enable development of a personal narrative (Kohler Riessman, 2003), so that the interviewees could reflect on their experiences of everyday life and family farming (Glucksmann, 2000). An interview guide was constructed based on themes in the theoretical framework and explored the experiences of the participants' everyday world, their background,

their view on the future and their farm. The material was later coded deductively based on these themes. During the course of the research, sub-coding was conducted inductively, based on communalities and conflicts, and transformed into categorical themes based on patterns and communalities.

The farm provided the main income for the household, but was the sole source of income for only three of the eight farms. One of the women and four of the men were involved as board members of different agricultural business organizations, mainly the dairy association. About half the women interviewed had experience of paid care work and two combined their farm activities with off-farm labour. Many of the women related their situation to the temporal and spatial organization, restrictions and changes in the local labour market (cf. Leach, 2000). The annual turnover of the farms ranged between 2 and 10 million Swedish kronor (SEK) and the area of arable land ranged from 80 to 600 hectares. The majority of the farms had turnover of around 3.5 million SEK, about 150 hectares of arable land and about 70–80 productive cows. Half the farms surveyed were organic and half conventional. On half of the farms, a son was a joint owner and in the process of taking over.

Results

Time Management

A central perception of the farming profession among the interviewees was that it allowed them to organize their working day. The farmers often associated this factor with freedom and independence. They appreciated the greater control over their work, being able to determine when and how they undertook different tasks. The temporalities of farming were contrasted favourably by a number of participants with their experiences of the labour process in offices and in industry. Woman 1 felt ‘trapped’ in the office and Man 8 reflected on his latest off-farm employment:

M8: ‘I think it was during the years in industry that I felt so damn tied up. I have never really got tired of agriculture. [In hard times], I just compare it to standing by the assembly line and then it feels better.’

Interviewer: ‘By tied up, do you mean the routine aspect of the work or standing by the assembly line?’

M8: ‘Yes, both of those things, but I’m also not the kind of person who other people decide over. I couldn’t take it.’

Even though a number of factors and actors, such as deliveries, milk collection, calving, diseases, network labour, etc., shape the temporal and spatial organization of the labour process and social relations, the interviewees emphasized the freedom of farming, even in an often packed working day. In the general analysis, this could be distinguished as a central part of the collective narrative of agriculture. Woman 7 asked the rhetorical question: ‘If we have a calving at three in the night, am I doing that in my leisure time?’ This could be interpreted as the interviewees experiencing greater flexibility in disposal of labour time, and should mainly be seen as their satisfaction with time management. However, the flexibility and autonomy in farming concerning how work is organized comes at the expense of longer working hours (cf. Brannen, 2005). On many occasions, farmers work under great time pressure to keep up with the rhythms of agroecological processes (cf. Holloway, 2001; Bernstein, 2010; Riley, 2011).

During recent decades, new developments in milking technology and livestock housing have reshaped production on dairy farms (Holloway, 2007; Holloway et al., 2014a, 2014b). Today, there are two main systems for housing (tie-up barns and cubicle sheds) and two milking systems (manual and automatic). The combination of these two types of systems in use can differ between farms. On the farms surveyed in this study, cubicle shed systems with a milking parlour (manual) or automatic milking were most common. These two systems impose different temporalities. The manual milking system enforces a more routine and clock-based organization of the labour process, with two daily milkings (morning and late afternoon). In the automatic system, milking is carried out throughout the day with the help of computers and milking robots. However, Man 2 reflected on how the automatic systems have affected the spatio-temporal relation of farming:

‘The downside is that you’re never finished. It goes on around the clock and the milking is never done, so to say. Before, you knew that the work was done at six o’clock in the evening and you were able to go off somewhere and not have to milk until next morning. [Today], if it stops or if the alarm goes off, we have to get back and fix it.’

A number of other interviewees who use a similar system described similar dilemmas – additional aspects that extend or blur the spatio-temporal boundaries of the working day. Nearly all participants experienced a lack of distinction in time and space between work and non-work and between farm and household (cf. Tietze and Musson, 2002), making it difficult to describe a typical working day. Some of the participants felt that this ceaseless form of work is psychosocially challenging and that their social engagements and activities have suffered due to the lack of spatio-temporal boundaries in the farm labour process. Man 8 noted that:

‘The disadvantage, as a human being, might be that you live a hundred per cent with your thoughts on this damn farming business. I also worked at home [at the farm] with my father and there has not been a day since 1970 when I have not had my mind in farming and thought about what I should do. In that way, I have never cleared my head.’

The wives who did not have a farming background and therefore had a shorter process of socialization into the temporalities of farming also expressed this clash between temporalities. Woman 7 described the spatio-temporal relations of dairy farming thus:

‘It was definitely difficult in the beginning, before you realized how you should “think”, if you like. [My husband] has this background, he grew up on a dairy farm and both his grandfather and father did too. He was more into this way of thinking, which I wasn’t.’

The spatial interconnection between home and farm through the property situates the choices and decisions of business and family life. The participants reported that events in one sphere have consequences across spheres and socio-economic modes. Woman 7 contrasted her situation with her earlier experiences of the labour market:

‘It is work, leisure and it is all connected. If our farm does not do well and we cannot make it, maybe we have to sell. Someone who works in a regular job can be sacked, but still keep their home and look for a new job.’

A number of the women noted that farming is not only a lifestyle but also a choice,

with longer temporal and spatial connections. Based on their earlier experience, they pointed out that in farming it is not possible just to change jobs. The spheres of provision and production are thereby interconnected through the farm unit – the property (cf. Niskanen, 1998, p. 77). This also represents a larger problem in a historical landscape constituted by smaller production units. The flexibility and the autonomy over how work is organized does not seem to result in farmers spending less time working (cf. Brannen, 2005). The development of new milking technologies has altered the relations of the labour process, rationalizing work in time and space by introducing a different spatial and temporal organization of labour on the farm. It has thereby extended or blurred the spatio-temporal boundaries of the working day.

Although new technologies and the appropriation of the agrarian labour process gave rise to ‘new possibilities for the “annihilation” of space and time’ (Lockie, 2006, p. 35), the interview material showed how these technologies drive rationalization of actions in time and space, contributing to a shift in spatio-temporal relations and imposing new temporalities. With increasing farm size and the introduction of new technologies, the temporalities and spatio-temporal relations of dairy farming tend to take increasingly industrial forms (cf. Guthman, 2004). New technologies, such as automatic milking systems, are developed and introduced to save time in a context where time is money. This is mainly achieved by controlling time; controlling the seasonality and variations of dairy farming. Through rationalization of the labour process and enforced flexibility to adapt to the arable patterns of production, service and consumption, the control of time in the production process should be regarded as an integral part of industrial capitalism (cf. Adam, 2000). The new technologies bring new tasks and skillsets that are allocated to a specific kind of people, shaping the social relations and temporalities of the family farm (cf. Braverman, 1974; Cockburn, 1991). These new technologies are also a way for external actors to penetrate the control of the farm labour process and, through these systems, to impose a form of impersonal control that is perceived by the participants as a smaller burden than managerial presence.

Flexible Times

The interviewees noted that the farm labour process is partly dependent on flexibility in time-space and know-how to handle variations based on unpredictable events, such as sickness and injuries. To ensure this flexibility, according to the interviewees, the labour process has to be organized in particular ways, based on physical, social and knowledge conditions. The farm ‘should not stand and fall with one man.’ Some grown-up children of the farm couple who work off-farm have helped out on the farm from an early age and continue to do so if they have the time. Another active tactic practised by the farmers is to circulate work tasks, mainly to their adult children, to ensure a wider spread of the knowledge and skills needed for daily farm operations. A couple of the male interviewees described how their sons or daughters had to step in during their absence owing to sickness or injuries. This flexibility is mainly in relation to the temporality of the husband on the farm. This results in the wife, children and employee(s) being constituted as flexible labour, which shapes the temporalities of these groups. In order to cope with the high workload, some interviewees claimed that a certain amount of flexibility is required in organizing the labour process to free up time for activities and commitments outside the farm, such as recreational, social and committee engagements.

The organization of the farm labour process and the temporalities of the farm are highly seasonal, which creates large variations in spatio-temporal relations depending on agroecologies, networks/communities and environmental management. The temporal and spatial rhythms of ecological processes require large spatio-temporal variations in the labour process, resulting in an increased need for labour in certain periods of the year, particularly during harvesting. Some farms are able to handle these variations based on their ordinary labour, while others are dependent on social networks or communities for additional labour. The support of other family members, mainly parents, and collective organization of harvesting on different farms are two of the main ways to handle these variations and the need for additional labour. Woman 7 described the role of her parents during harvest:

'When the barn work is finished in the morning, then it's time to harvest the silage. You maybe take a short break for dinner. We often have the luxury that my parents come and help us out with that part, so that I don't have to stop to prepare the dinner... which would have taken me at least an hour. They [the parents] tend to come here and act a little bit as household assistants.'

These arrangements involve negations of temporalities that are both constitutive of, and constituted by, social relations on the farm and the rural community. In this process, many of the interviewees highlighted the importance of neighbours and exchanges, both in spatial relation to the farm and the area of cultivated land. Collective organization of harvesting underlines the rootedness of social networks in place and work. Differences in temporalities and in control over the disposal of time are an important area of variation between the two groups of farms that are dependent on additional labour and support. Other types of spatio-temporal variations are primarily related to animal welfare, the health of the actors in the labour process, and construction work. The participants described how the weather influences their organization of labour and constitutes a temporality that shapes the spatial-temporal relations of the farm labour process, as well as in the household. Man 2 said:

'It's just this weather dependency of when to harvest. You have to pay attention to the weather all the time and you can't decide anything without [taking it into account]. If you are to have some holiday time, then those days can't come in the way [of the harvest]. It has to be in the period when we know that it's safe to decide on something. The summer period is a hectic time. When we can hold a birthday party, or anything else, is based on when we are able to harvest grass the next time.'

The examples that other interviewees gave mainly related to their lack of ability to plan ahead, both professionally and socially, e.g. trips and social events, and rapidly changing conditions, e.g. completing the harvest before rain. In structuring time based on these conditions, many of the older farmers believed that it is now more difficult to predict the weather due to more rapid environmental shifts. One of them, Man 4, stated:

'I feel that the climate is getting harder and harder [to predict], definitely. There's more sudden changes in the weather and heavy rain, that's my experience anyway and I think that others share it.'

Dependence on nature and the climate order time-space and produce a specific tem-

porality that is interconnected with temporalities across different spheres and socio-economic modes through the prioritization of a variety of tasks. The more rapid variation in climate also imposes a gradual shift in the temporality that occupies more time and decreases spatial and temporal flexibility, while demanding a different form of flexibility. The rhythms of agroecological processes and the dependence on the weather clearly visualize the temporal separation of culture from nature through the creation of clock-time. The clock could be seen as one way in which capital penetrates and structures family farming (cf. Friedmann, 1981; Marsden et al., 1986; Marsden, 1991), especially with economic incentives connected to contract farming. However, the informal exchange of labour, equipment and services means that clock-time cannot be regarded as the dominant medium of exchange in family farming. As with domestic labour, this underlines the situated position of the farm labour process in the interconnectedness across different socio-economic modes: off-farm wage labour, hired farm labour, family farm labour, domestic labour and informal exchange.

Division of Labour

The interviews revealed temporal and spatial differences between the work and nature of tasks undertaken by husband and wife. The technical and spatial division was often interconnected, with the wife being responsible for domestic and care work within the household, but also outside the domestic sphere in the form of, for instance, regular consumption work and in relation to childcare. In addition to care of animals and desk work, Woman 4 pointed out that ‘there is a lot of service work: there should always be food on the table, coffee made and a cake baked’ – expectations that structure the temporalities and the spatio-temporal relations of the farm. The experience of these expectations in terms of their main responsibility in the household was shared by many of the women. Family responsibility forces women to expand the multiplicity of temporalities in which they work, e.g. through consumption, care, domestic work, farm work and off-farm work (cf. Maher, 2009). This greater flexibility also intensifies the pressure of work (cf. Green, 2001). However, many of the interviewees, both husbands and wives, stressed the interdependencies of work undertaken on different socio-economic bases: the household and the farm. One of the husbands, Man 6, described this connection and its importance in recruiting extra help during the intense periods of summer:

‘It is clear that if they have to bring sandwiches when they come here, it’s not much fun. They want the social: to eat together and drink coffee. It means a lot.’

In general, labour undertaken on the farm, in the barn and out in the fields mainly constitutes the node around which other types of labour are organized and time is allocated. The husbands’ labour occurs less across different temporalities and socio-economic bases and their activities are primarily situated out in the field and involve the use of machinery (cf. Kallioniemi and Kymäläinen, 2012). Men more often perform the milking, while women are responsible for the care of calves and non-productive cows. Although the gendered division of labour in direct relation to dairy production is more flexible, the number of tasks and how the work is structured have a gendered character. Similar patterns are evident in the labour undertaken by sons and daughters of the family, where the daughters to larger extent undertake

domestic labour while the sons follow the work patterns of the husbands, as well as being joint owners of the farm.

Structuring of Time

Social relations shape the temporal and spatial organization of the farm labour process. The central subject of influence, according to all interviewees, is the animals and their well-being. Dairy farming is strongly adapted to the temporal and spatial rhythms of ecological processes and dairy cows. Working with animals imposes temporalities with large variations and was referred to by interviewees as one of the significant factors shaping the temporalities of family-based dairy farming. The interconnectedness of emotional, social and economic relations in the temporal and spatial organization manifests itself in great care for the animals, emphasized by the emotional and economic costs of e.g. mastitis (cf. Holloway, 2001; Yarwood and Evans, 2006; Riley, 2011).

In dairy farming, the production of fresh produce imposes a temporal imperative for speed and coordination. The interconnection across the process of production, distribution, exchange and consumption structures the temporalities of dairy farming and is evident on a daily basis through the milk lorry visits. Woman 8 described how she has to help out with the milking in the morning, before taking care of her other tasks, since 'we have such an early pick up of the [milk] tank that we have to make sure that everything gets done in time'. In many cases, milk collection is temporally and spatially interconnected with the location of the individual farm. Technological innovation, industrial restructuring and economic change, such as the introduction of milking robots, private labelling and price fluctuations, have shifted the mode of interconnection across the process of production to consumption. This was particularly apparent in the interviewees' reflections over how the fluctuations and changes in the national and global market affect them, primarily through the producer price of milk, and decrease spatial and temporal distances.

The high labour intensity of dairy farming means that the majority of farms in the case study were dependent on additional labour input, either hired or family labour. The interviewees with hired labour described the step from being just family-labour based to hiring additional labour as major, from an economic, organizational and social perspective. The majority of the interviewees indicated that this shift was a major temporal and spatial upheaval that enforced a temporal and spatial imperative of coordination and trust. Through social practices, such as coffee breaks and meals in the farm kitchen, the rhetoric of family belonging and quasi-family relationship helps incorporate the hired labour into the temporalities of the family farm and the farm labour process. In relation to hired labour, Woman 5 mentioned that she will 'always have them at the table, as we always have done. But it is just fun and social.' Some interviewees noted that being brought up on a farm made it easier to adapt to the temporal and spatial organization of work.

Kinship constitutes the organizational basis for the farm labour process and is materialized in the farm property in terms of feelings and of values. The control over the labour process is therefore articulated differently depending on the combination of family or hired labour (cf. Bernstein, 2010). With its basis in family labour, control of hired labour is exercised through relationships and their integration in the family structure (cf. Newby, 1972). This means that the social relations and organization of the farm labour process are often articulated in terms of family relations;

characterized by trust, obligation and affection, through social practices and 'being part of the family'. The socialization and fostering of younger employees described by the interviewees resonates with findings by Newby (1977) in the British context and supports the claim by Burawoy (1979, p. 30) that the labour process 'must be understood in terms of the specific combinations of force and consent'. Braverman (1974) points out the importance of understanding the processes of control in order to comprehend the structuring of the labour process. The results of the present study demonstrated the male control of the farm labour process. Kinship, the spatial interrelation between the farm and the household and the 'organized flow of activities through time' (Ploeg and Long, 1994, p. 15) could be regarded as the material basis of organization, or management style in the words of Burawoy (1979), that makes both farm men and women participate in their own exploitation or self-exploitation (cf. Chayanov, 1986). The present study showed how the farm labour process in many ways resembles the exploitative processes of women in unpaid domestic work and paid care labour (e.g. Rose, 1983; Armstrong and Armstrong, 2005; Clough and Halley, 2007), but where the emotional responsibility for the family is combined with e.g. animal welfare and the generational place (the farm). In the context studied here, resistance is mainly practised in relation to external factors and actors, e.g. through attempts to reduce economic risks and to increase control of the labour process. The class-based relations of farming are emphasized in the differentiation between farms in relation to their dependence on external support and hired labour. The relationship between the farm family and hired help dismantles the traditional and dichotomizes definitions and representations of the home and the farm, as well as temporal and spatial relations in the concept of class struggle (McDowell, 2006).

The wives interviewed, who had the main responsibility for domestic work and care labour, mainly controlled the timing and chores in the domestic sphere. Since the distinction between the public and private sphere is vague, to say the least, they undertook domestic work and off-farm errands at times to suit themselves and their other types of labour. Woman 7 said that:

'We can take a Wednesday off and run some errands. I've also worked at a healthcare clinic – then I worked eight to five everyday, Monday to Friday. There was no chance of getting an appointment at the hairdresser on a Saturday and it was not possible to do bank errands on weekends.'

Since farm life can be difficult at times, Woman 7 underlined that it is important to focus on the positive sides of family farming and its different modalities of life. However, women's management of time was also subject to external constraints and the work was partly dominated by clock-time allocated to specific chores, e.g. preparation of meals and driving children to and from school and other activities. Although not strictly governed by clock-time in their work, these women juggle and move between different temporalities (cf. Thompson, 1996). The domestic and care work is carried out to meet the clock-time regulations of the school and the farm labour process and, in the case of three women, the timing of off-farm employment and board activities. Woman 1 described this:

'In the afternoon, there are a lot of activities with the children: picking them up and giving them a lift. I have always done all of this. I have left [the farm work] to do this.'

In a similar way, clock-time is imposed on the farm labour process by the clock-

based arrangement of veterinary services, the milk lorry, the authorities and timings of off-farm employment and board activities. Similarly to the organization of domestic work, the temporality of dairy farming often does not constitute a linear flow but is composed of cycles: undertaking tasks and chores with specific regularities. Women's work can also be seen as possessing a more cyclical character, while the interconnection between men's work and the public sphere associates it to a more linear and progressive articulation of time. The perception of both household and farm time is structured by sequences of tasks, rather than quantities of hours (cf. Gershuny et al., 1994), and thereby emphasizes the 'labour-price advantage' of the family farm (Koning, 1994, p. 172).

Different work and non-work activities by household members may result in clashes between differing temporalities, as identified by Kaufman-Scarborough (2006). Shifting work between different modes of provision may require new articulations of temporalities between these. The shift of temporalities in one sphere alters the relations between spheres. After becoming a parent, Woman 2 felt that she had to stop working full-time, mainly because of the irregular working hours of paid care labour. However, she underlined that she 'might have continued working a higher level of part-time if one had worked office hours'. The structuring of husbands' work as dominant could thereby be understood as interconnected with the gendered labour market and distribution of domestic labour. For many of the women, both with and without a farming background, moving in together involved a double life transition, both in work and in personal life. In many cases, those with no farming background had a greater transition in terms of temporal and spatial dimensions, while many of the husbands already lived on the farm and all were socialized into the temporalities of farming. Man 7 described this in relation to his wife with a non-agricultural background:

'You are never able to attend a celebration, a birthday party or something else without the risk of suddenly having to leave for a calving. Since I have grown up with this and have always lived with it, I'm used to it happening. But I think that [my wife] found it quite difficult when she moved here.'

In these cases, the difference in socio-temporal expectancies of men and women was greater (cf. Daly, 2002). The spatial and temporal relations of the women were shaped by the fact that most of them had moved to the area and thereby lost their local social networks. The patrilocality of family farming thereby shapes the gendered relations and the power relations of agriculture. One of the recently relocated wives mentioned difficulty in finding her way around by car, something that affected both her professional and social life. A number of women described how, in the beginning, it was difficult to have a social life and find new friends, and how they were largely dependent on the social network of their husbands.

Different Temporalities and Expectations

Shaping the internal relations of the family farm, the gendered labour market appears to have both push-and-pull effects on the women in the study. In many cases, it offers women a possibility of employment in the public sector, while the gendered conditions of the same sector also 'push' women onto the farm. In the latter situation, the dependence on the husband increases, expanding the unequal power relations of the household. The temporal and spatial organization of domestic labour

and care work resulted in a number of the wives interviewed here choosing to leave wage labour outside the farm or start working part-time after maternity leave. The spatial and temporal distance to work and to childcare was the main reason, plus friction between different temporalities (cf. Thompson, 1996; Maher, 2009). Woman 7 described the situation after her maternity leave:

‘Commuting [to work] with two young children: milk, his medicine and everything. Then I had to choose: either to leave the kids at daycare down in [the village] for 12–13 hours a day, or try to be at home. The choice was fairly easy – I stayed at home.’

The lack of childcare for people working outside regular office hours and in more remote areas exacerbated the contradictory effects of temporal shifts. Most of the wives were involved, at present or previously, in off-farm work with paid care labour. This interconnection of different temporalities caused friction in the organization of domestic labour and care work. However, a number of husbands claimed that the irregular working hours of paid care labour in fact helped decrease the number of conflicts. According to Man 2:

‘[My wife] also has a job, in health care, which doesn’t take place seven to four, Monday to Friday. It is evenings and weekends, just like here [on the farm]. She can’t say anything if I work weekends and evenings, since she does that too. It is mutual. I think this might be the explanation why it has worked as well as it has.’

That husband felt that the similar structure of the different temporalities and the disposal of time provided a shared temporal understanding and position in the domestic negotiation of time. The wives without a farm background said that on moving to the farm, the temporal differences were the largest transition. Many of these wives were used to the organization of labour being structured by clock-time, clearly marking the start, end and duration of the working day. Woman 7 said:

‘Animals are animals – anything can happen. That’s how it is and I’m not native here either so I had to learn that this is not just a job, it is a whole lifestyle. It weaves in the work of course, but it goes round the clock, how should I put it, I’m at work as soon as I’m awake.’

These differences in expectations reveal a difference in temporal and spatial experiences inside and outside agriculture. The differences in temporalities were reported to cause frictions and conflicts in households (cf. Price and Evans, 2006), and one husband claimed that such clashes resulted in the end of his first marriage. The shift in temporalities also manifested itself in relation to the public sphere, according to the participants, mainly in connection with their children’s activities. The temporalities of dairy farming often clashed with some of the more dominating temporalities in the community and public sphere, affecting the parents’ ability to attend school performances and various after-school activities. Some of the participants, often with smaller children, felt that this temporal shift influenced their children’s experience of parenthood, in comparison with that of other children. The mixture of temporalities has consequences across different spheres, as Woman 5 noted:

‘We rarely get away as a family. Very rarely, and it’s never easy. There’s always pressure to get the milking over quickly so you can get away. Then you almost fall asleep, since you are exhausted.’

The second milking period of the day often takes place at the same time as other people end their working day and pick up their children from school. This results in the interviewees feeling 'sandwiched' between the demands of the farm and their responsibilities as parents (cf. Hochschild, 1997; Gershuny, 2000; Coyle, 2005). However, many of the parents in the study cited the temporal and spatial advantages with the temporalities of farming, particularly being at home most of the time. In relation to the women in particular, their presence, 'being there', could be seen as central in their spatial-temporal understanding of motherhood (cf. Maher, 2009).

Women's working patterns have always been more diverse than men's, both in terms of time and tasks. Women are often engaged in multitasking, especially across different temporalities (e.g. in relation to care, household provisioning, domestic and farm labour) and spheres (public, farm and domestic). Because the types of tasks that women usually perform are not recognized as work, their labour could be perceived as more exploited. However, it was primarily the clashes between different temporalities and expectations connected to them that seemed to affect the interviewees' experience of the quality of time (cf. Wajcman, 2008). Much of women's work in the domestic and public sphere does not conform to standard working time. The male wage labour norm constitutes the basis for the definition of 'standard', conceptually articulating the spatial and temporal division of men's and women's labour. However, as M. Harvey (1999, p. 25) emphasizes, there is 'nothing normal about "normal" working time'. In the case of dairy farming, the clashes with 'normal working time' mainly create challenges in the labour undertaken in different spheres by women, but also in terms of social interaction outside the temporalities of farming. The more general conflict of different temporalities primarily materializes with regard to their children and their expectations. The results show that differences in the structure and experience of temporality are one aspect in the division between public and private (cf. Glucksmann, 1998). The difference in the spatio-temporal experiences of men and women was articulated in terms of confrontations between different temporalities of work in different spheres, paid and non-paid, in a way that visualized the gendered relations of time in agriculture. The interviews also revealed the gendering of flexibility in relation to full-time engagement in farming. Women had to juggle multiple tasks and temporalities across a variety of spheres to a greater extent, structuring their work in relation to the temporalities of others. The flexibility in dairy farming not only comprises working time, but also non-work time, which cannot be planned on a fixed and regular basis (cf. Beynon, 2002).

Conclusions

Controlling the disposition of time is an important factor in farming couples' choice and perception of their occupation. It differentiates the temporalities of farming from wage labour in terms of the modalities of life. Although allowing limited control due to increased external pressures in the form of economic processes and technologies, farming couples' control and management of time are interconnected and structured by the different temporalities of men and women, and their experience of these. This study showed how the gendered division of labour constitutes a basis for articulation of power through the disposition of time. This results in the structuring of men's and women's everyday worlds being both constitutive of, and constituted by, spatial and temporal relations. The consequence is that men and women in family farming are exposed to different environments, expectations and psychosocial and

economic pressures as a result of the spatio-temporal relations (cf. Price and Evans, 2006; Andersson and Lundqvist, 2014). To some extent, this also reflects the social relations of the family farm in general, in its specific location and in the restructuring agricultural sector.

The understanding of temporalities as situated and historically specific in their spatial and socio-economic relations underlines the need to consider agrarian and rural contexts. In understanding gendered, classed and embodied subjectivities, the body (in matter, form, environment and spatio-temporal location) needs to be rethought through new tools and perspectives (Grosz, 1995, p. 84) to better comprehend how these affect individuals and their internal emotional geographies (McDowell, 1999; Riley, 2011). However, it is important to emphasize the dependence on social theory of the temporal perspective, since it cannot itself explain the distribution or principles of ordering. In this study, the temporal perspective proved to be a fruitful tool within the study of the rural as well as family farming. It offered some vital insights into the relations between family and farm and between paid and non-paid labour, transcending its dual and dichotomized relation, and into concepts of lifestyle (Bennett, 2005; Heather et al., 2005; Price and Evans, 2009), and expanding the understanding of the agrarian labour process within the capitalist system. More attention must be paid to the relationship between family farming and agriculture from a temporal and spatial approach in order to improve understanding of the gendered, classed and embodied subjectivities and processes in these contexts and to 'tackle the reality of the farming way of life, rather than continually validate its cultural practices' (Price, 2010a, p. 93). This study contributed directly to research on agrarian sociology and family businesses. By offering an alternative approach and case study, it also contributed more generally to research on work sciences and sociology – primarily in relation to the issues of shifts in work organization and the introduction of new technologies in the labour process. By linking these two parts, the study made a significant contribution to understanding the new technologies of dairy farming (cf. Butler et al., 2012; Jacobs and Siegford, 2012; Holloway et al., 2014a; Hansen and Jervell, 2015), which in relation to their advances and spread in Western agriculture have received limited attention.

The study showed how the centralization of employment and childcare to population centres, together with the shifting economic conditions causing e.g. farm expansion, has contributed to greater involvement of women in agriculture and increased responsibilities for care, domestic work and consumption labour due to the remote geographical location and classed position of the farm. Reinforced by patriarchal relations, the material relations embodied in the farm in terms of family home and husband's business structure the temporalities of each family member and impose specific types of flexibilities. The material in this study underlined how the male dominance shapes the structuring of the labour process – reproducing the male domination over women's labour. Confirming previous research (Price, 2010b; Price and Evans, 2009; Andersson and Lundqvist, 2014), the study also revealed the embodiment of flexibility with its physical consequences and the multiple responsibilities that entail limited experiences and knowledge of specific tasks and work on the farm. There were no signs of renegotiation of the sexual division of domestic labour or farm labour between couples (cf. Blekesaune, 1996; Brandth, 2002; Kelly and Shortall, 2002; Heather et al., 2005; Price and Evans, 2009; Price, 2010a). Placed within the spatio-temporal materiality of the family farm, the responsibility for the family forced women to expand the multiplicity of temporalities in which they work

and the greater flexibility intensified pressure in work (cf. Teather, 1994; Heather et al., 2005; Price and Evans, 2005, 2009). Based on the gendered division of labour, the articulation of power through the sorting of time materializes the different experiences of temporalities between men and women. Thus on the types of family farms studied here, the different temporalities of dairy farming reproduce the sorting of time, sexual division of labour and social relations of the family, the agricultural sector and society, and ensure men's dominance, power and access to property.

References

- ACKER, J. (1990) Hierarchies, jobs, bodies: a theory of gendered organizations, *Gender and Society*, 4, pp. 139–158.
- ADAM, B. (2000) The temporal gaze: the challenge for social theory in the context of GM food, *British Journal of Sociology*, 51, pp. 125–142.
- ADAM, B. (2003) Reflexive modernization temporalized, *Theory, Culture and Society*, 20, pp. 59–78.
- ANDERSSON, E. and LIDESTAV, G. (2014) Gendered resource access and utilisation in Swedish family farming, *Land*, 3, pp. 188–203.
- ANDERSSON, E. and LUNDQVIST, P. (2014) Gendered agricultural space and safety: towards embodied, situated knowledge, *Journal of Agromedicine*, 19, pp. 303–315.
- ANDERSSON, E. and LUNDQVIST, P. (2016) Gendered time in Swedish family farming: operationalising an agrarian typology using the Swedish Farm Accountancy Data Network, *Journal of Family Business Management*, 6, pp. 310–329.
- ARMSTRONG, P. and ARMSTRONG, H. (2005) Public and private: implications for care work, in: L. PETTINGER, J. PARRY, R. TAYLOR and M. GLUCKSMANN (eds) *A New Sociology of Work?* Oxford: Blackwell Publishing, pp. 169–187.
- BARLETT, P.F., LOBAO, L. and MEYER, K. (1999) Diversity in attitudes toward farming and patterns of work among farm women: a regional comparison, *Agriculture and Human Values*, 16, pp. 343–354.
- BENNETT, K. (2005) The identification of farmers' wives: research challenges in the northern fells, Cumbria, in: J. LITTLE and C. MORRIS (eds) *Critical Studies in Rural Gender Issues*. Aldershot: Ashgate Publishing, pp. 60–75.
- BERNSTEIN, H. (2010) *Class Dynamics of Agrarian Change*. Halifax: Fernwood Publishers.
- BEYNON, H. (2002) *Managing Employment Change: The New Realities of Work*. Oxford: Oxford University Press.
- BJØRKHAUG, H. and BLEKESAUNE, A. (2008) Gender and work in Norwegian family farm businesses, *Sociologia Ruralis*, 48, pp. 152–165.
- BLEKESAUNE, A. (1996) *Family Farming in Norway: An Analysis of Structural Changes within Farm Households between 1975 and 1990*, Ph.D. Thesis, University of Trondheim.
- BOCK, B.B. (2006) Introduction: rural gender studies in north and south, in: B.B. BOCK and S. SHORTALL (eds) *Rural Gender Relations: Issues and Case Studies*. Wallingford: CABI Publishing, pp. 1–15.
- BRADLEY, H. (1986) Technological change, management strategies, and the development of gender-based job segregation in the labour process, in: D. KNIGHTS and H. WILLMOTT (eds) *Gender and the Labour Process*. Aldershot: Gower Publishing, pp. 54–74.
- BRANDTH, B. (2002) Gender identity in European family farming: a literature review, *Sociologia Ruralis*, 42, pp. 181–200.
- BRANDTH, B. (2006) Embodying family farm work, in: B.B. BOCK and S. SHORTALL (eds) *Rural Gender Relations: Issues and Case Studies*. Wallingford: CABI Publishing, pp. 329–344.
- BRANDTH, B. and HAUGEN, M.S. (2005) Doing rural masculinity: from logging to outfield tourism, *Journal of Gender Studies*, 14, pp. 13–22.
- BRANDTH, B. and HAUGEN, M.S. (2011) Farm diversification into tourism: implications for social identity?, *Journal of Rural Studies*, 27, pp. 35–44.
- BRANNEN, J. (2005) Time and the negotiation of work–family boundaries: autonomy or illusion?, *Time and Society*, 14, pp. 113–131.
- BRAVERMAN, H. (1974) *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century*. New York: Monthly Review Press.
- BRYANT, L. (2001) The 'text-book farmers': young women constructing occupations in farming, in: S. LOCKIE and B. PRITCHARD (eds) *Consuming Foods, Sustaining Environments*. Brisbane: Australian Academic Press, pp. 205–217.
- BRYANT, L. and PINI, B. (2011) *Gender and Rurality*. New York: Routledge.

- BRYDEN, J., BELL, C., GILLIATT, J., HAWKINS, E. and MACKINNON, N. (1993) *Farm Household Adjustment in Western Europe 1987–1991: Final Report on the Research Programme on Farm Structures and Pluriactivity*. Luxembourg: Office for Official Publications of the European Communities.
- BURAWOY, M. (1979) *Manufacturing Consent: Changes in the Labor Process under Monopoly Capitalism*. Chicago, IL: University of Chicago Press.
- BURTON, R.J.F. and WILSON, G.A. (2006) Injecting social psychology theory into conceptualisations of agricultural agency: towards a post-productivist farmer self-identity?, *Journal of Rural Studies*, 22, pp. 95–115.
- BUSCH, L. (1989) Irony, tragedy, and temporality in agricultural systems, or, how values and systems are related, *Agriculture and Human Values*, 6, pp. 4–11.
- BUTLER, D., HOLLOWAY, L. and BEAR, C. (2012) The impact of technological change in dairy farming: robotic milking systems and the changing role of the stockperson, *Journal of the Royal Agricultural Society of England*, 173, pp. 1–6.
- CHAYANOV, A.V. (1986) *On the Theory of Peasant Economy*, D. Thorner, B. Kerblay and R.E.F. Smith (eds). Madison, WI: University of Wisconsin Press.
- CLOUGH, P.T. and HALLEY, J.O.M. (2007) *The Affective Turn: Theorizing the Social*. Durham, NC: Duke University Press.
- COCKBURN, C. (1991) *Brothers: Male Dominance and Technological Change*. London: Pluto Press.
- COYLE, A. (2005) Changing times: flexibilization and the re-organization of work in feminized labour markets, in: L. PETTINGER, J. PARRY, R. TAYLOR and M. GLUCKSMANN (eds) *A New Sociology of Work?* Oxford: Blackwell Publishing, pp. 73–88.
- CRANG, M. (2005) Time: space, in: P.J. CLOKE and R. JOHNSTON (eds) *Spaces of Geographical Thought: Deconstructing Human Geography's Binaries*. London: Sage Publications, pp. 199–220.
- DALY, K. (2002) Time, gender, and the negotiation of family schedules, *Symbolic Interaction*, 25, pp. 323–342.
- DESERAN, F.A. and SIMPKINS, N.R. (1991) Women's off-farm work and gender stratification, *Journal of Rural Studies*, 7, pp. 91–97.
- DJURFELDT, G. and GOOCH, P. (2002) Farm crisis, mobility and structural change in Swedish agriculture, 1992–2000, *Acta Sociologica*, 45, pp. 75–88.
- DOUPHRATE, D.I., HAGEVOORT, G.R., NONNENMANN, M.W., LUNNER KOLSTRUP, C., REYNOLDS, S.J., JAKOB, M. and KINSEL, M. (2013) The dairy industry: a brief description of production practices, trends, and farm characteristics around the world, *Journal of Agromedicine*, 18, pp. 187–197.
- EVANS, N.J. and ILBERY, B.W. (1993) The pluriactivity, part-time farming, and farm diversification debate, *Environment and Planning A*, 25, pp. 945–959.
- FLYGARE, I. (1999) *Generation och kontinuitet : familj jordbruket i två svenska slättbygder under 1900-talet*. Uppsala: Upplands fornminnesfören. och hembygdsförb.
- FLYGARE, I. (2001) Länkar, agenter och alternativ: kvinnogenerationer i 1900-talets jordbruk, in: B. LILJEWALL, K. NISKANEN and M. SJÖBERG (eds) *Kvinnor och jord*. Stockholm: Nordiska museets förlag, pp. 13–30.
- FRIEDMANN, H. (1981) *The Family Farm in Advanced cCapitalism: Outline of a Theory of Simple Commodity Production in Agriculture*. Toronto: University of Toronto.
- FRIEDMANN, H. (1986) Patriarchy and property, *Sociologia Ruralis*, 26, pp. 186–193.
- GERSHUNY, J. (2000) *Changing Times: Work and Leisure in Postindustrial Society*. New York: Oxford University Press.
- GERSHUNY, J., GODWIN, M. and JONES, S. (1994) The domestic labour revolution: a process of lagged adaptation, in: F. BECHHOFFER, J. GERSHUNY and M. ANDERSON (eds) *The Social and Political Economy of the Household*. Oxford: Oxford University Press, pp. 151–197.
- GILL, F. (2013) Succession planning and temporality: the influence of the past and the future, *Time and Society*, 22, pp. 76–91.
- GLUCKSMANN, M. (1990) *Women Assemble: Women Workers and the New Industries in Interwar Britain*. London: Routledge.
- GLUCKSMANN, M. (1998) 'What a difference a day makes': a theoretical and historical exploration of temporality and gender, *Sociology*, 32, pp. 239–258.
- GLUCKSMANN, M. (2000) *Cottons and Casuals: The Gendered Organisation of Labour in Time and Place*. Abingdon: Sociologypress.
- GLUCKSMANN, M.A. (2009) Formations, connections and divisions of labour, *Sociology*, 43, pp. 878–895.
- GLUCKSMANN, M.A. and NOLAN, J. (2007) New technologies and the transformations of women's labour at home and work, *Equal Opportunities International*, 26, pp. 96–112.
- GREEN, F. (2001) It's been a hard day's night: the concentration and intensification of work in late twentieth-century Britain, *British Journal of Industrial Relations*, 39, pp. 53–80.
- GROSZ, E. (1995) *Space, Time, and Perversion: Essays on the Politics of Bodies*. New York: Routledge.
- GRUBBSTRÖM, A., STENBACKA, S. and JOOSSE, S. (2014) Balancing family traditions and business: gendered strategies for achieving future resilience among agricultural students, *Journal of Rural Studies*, 35, pp.

- 152–161.
- GUNNERUD BERG, N. and FORSBERG, G. (2003) Rural geography and feminist geography: discourses on rural-ity and gender in Britain and Scandinavia, in: J. ÖHMAN and K. SIMONSEN (eds) *Voices from the North: New Trends in Nordic Human Geography*. Aldershot: Ashgate Publishing, pp. 137–190.
- GUTHMAN, J. (2004) *Agrarian Dreams: The Paradox of Organic Farming in California*. Berkeley, CA: University of California Press.
- HANSEN, B.G. and JERVELL, A.M. (2015) Change management in dairy farming, *International Journal of Sociology of Agriculture and Food*, 22, pp. 23–40.
- HARVEY, D. (1990) Between space and time: reflections on the geographical imagination, *Annals of the Association of American Geographers*, 80, pp. 418–434.
- HARVEY, D. (2006) *The Limits to Capital*. London: Verso.
- HARVEY, M. (1999) Economies of time: a framework for analysing the restructuring of employment relations, in: A. FELSTEAD and N. JEWSON (eds) *Global Trends in Flexible Labour*. Basingstoke: Macmillan, pp. 21–42.
- HEATHER, B., SKILLEN, L., YOUNG, J. and VLADICKA, T. (2005) Women's gendered identities and the restructuring of rural Alberta, *Sociologia Ruralis*, 45, pp. 86–97.
- HEIDEGGER, M. (1977) *The Question Concerning Technology, and Other Essays*. New York: Harper & Row Publishers.
- HILL, F. (1981) Farm women: challenge to scholarship, *Rural Sociologist*, 1, pp. 370–382.
- HOCHSCHILD, A.R. (1997) *The Time Bind: When Work Becomes Home and Home Becomes Work*. New York: Metropolitan Books.
- HOLLOWAY, L. (2001) Pets and protein: placing domestic livestock on hobby-farms in England and Wales, *Journal of Rural Studies*, 17, pp. 293–307.
- HOLLOWAY, L. (2007) Subjecting cows to robots: farming technologies and the making of animal subjects, *Environment and Planning D: Society and Space*, 25, pp. 1041.
- HOLLOWAY, L., BEAR, C. and WILKINSON, K. (2014a) Robotic milking technologies and renegotiating situated ethical relationships on UK dairy farms, *Agriculture and Human Values*, 31, pp. 185–199.
- HOLLOWAY, L., BEAR, C. and WILKINSON, K. (2014b) Re-capturing bovine life: robot–cow relationships, freedom and control in dairy farming, *Journal of Rural Studies*, 33, pp. 131–140.
- JACOBS, J.A. and SIEGFORD, J.M. (2012) Invited review: the impact of automatic milking systems on dairy cow management, behavior, health, and welfare, *Journal of Dairy Science*, 95, pp. 2227–2247.
- JORDBRUKSDEPARTEMENTET (2004) *Det går långsamt fram: jämställheten inom jord- och skogsbrukssektorn*, Ministry series 2004:39. Stockholm: Jordbruksdepartementet.
- KALLIONIEMI, M.K. and KYMÄLÄINEN, H.-R. (2012) Women on Finnish dairy farms: hard work in the midst of traditions and changes, *Rural Society*, 22, pp. 78–89.
- KAUFMAN-SCARBOROUGH, C. (2006) Time use and the impact of technology: examining workspaces in the home, *Time and Society*, 15, pp. 57–80.
- KELLY, R. and SHORTALL, S. (2002) 'Farmers' wives': women who are off-farm breadwinners and the implications for on-farm gender relations, *Journal of Sociology*, 38, pp. 327–343.
- KINSELLA, J., WILSON, S., DE JONG, F. and RENTING, H. (2000) Pluriactivity as a livelihood strategy in Irish farm households and its role in rural development, *Sociologia Ruralis*, 40, pp. 481–496.
- KOHLER RIESSMAN, C. (2003) Analysis of personal narratives, in: J.A. HOLSTEIN and J.F. GUBRIUM (eds) *Inside Interviewing: New Lenses, New Concerns*. Thousand Oaks, CA: Sage Publications, pp. 331–346.
- KONING, N. (1994) *The Failure of Agrarian Capitalism: Agrarian Politics in the UK, Germany, the Netherlands and the USA, 1846–1919*. London: Routledge.
- LATOUR, B. (1993) *We Have Never Been Modern*. Cambridge, MA: Harvard University Press.
- LEACH, B. (2000) Transforming rural livelihoods: gender, culture and restructuring in three Ontario communities, in: S.M. NEYSMITH (ed.) *Restructuring Caring Labour: Discourse, State Practice, and Everyday Life*. Don Mills: Oxford University Press.
- LEFEBVRE, H. (1991) *The Production of Space*. Oxford: Basil Blackwell.
- LIDESTAV, G. (2010) In competition with a brother: women's inheritance positions in contemporary Swedish family forestry, *Scandinavian Journal of Forest Research*, 25, pp. 14–24.
- LITTLE, J. (1994) Gender relations and the rural labour process, in: S. WHATMORE, T. MARSDEN and P. LOWE (eds) *Gender and Rurality*. London: David Fulton Publishers, pp. 11–30.
- LITTLE, J. (2003) 'Riding the rural love train': heterosexuality and the rural community, *Sociologia Ruralis*, 43, pp. 401–417.
- LITTLE, J. and LEYSHON, M. (2003) Embodied rural geographies: developing research agendas, *Progress in Human Geography*, 27, pp. 257–272.
- LOCKIE, S. (2006) Networks of agri-environmental action: temporality, spatiality and identity in agricultural environments, *Sociologia Ruralis*, 46, pp. 22–39.
- MACDONALD, R., SHILDRICK, T., WEBSTER, C. and SIMPSON, D. (2005) Growing up in poor neighbourhoods: the

- significance of class and place in the extended transitions of 'socially excluded' young adults, *Sociology*, 39, pp. 873–891.
- MAHER, J. (2009) Accumulating care: mothers beyond the conflicting temporalities of caring and work, *Time and Society*, 18, pp. 231–245.
- MARSDEN, T. (1991) Theoretical issues in the continuity of petty commodity production, in: S. WHATMORE, P. LOWE and T. MARSDEN (eds) *Rural Enterprise: Shifting Perspectives on Small-scale Production*. London: David Fulton Publishers, pp. 12–33.
- MARSDEN, T., WHATMORE, S., MUNTUN, R. and LITTLE, J. (1986) The restructuring process and economic centrality in capitalist agriculture, *Journal of Rural Studies*, 2, pp. 271–280.
- MASSEY, D.B. (2005) *For Space*. London: Sage Publications.
- MCDOWELL, L. (1999) *Gender, Identity and Place: Understanding Feminist Geographies*. Cambridge: Polity Press.
- MCDOWELL, L. (2006) Reconfigurations of gender and class relations: class differences, class condescension and the changing place of class relations, *Antipode*, 38, pp. 825–850.
- MCKIE, L., GREGORY, S. and BOWLBY, S. (2002) Shadow times: the temporal and spatial frameworks and experiences of caring and working, *Sociology*, 36, pp. 897–924.
- MORELL, M. (2011) Agriculture in industrial society: 1870–1945, in: J. MYRDAL and M. MORELL (eds) *The Agrarian History of Sweden: From 4000 BC to AD 2000*. Lund: Nordic Academic Press, pp. 165–213.
- NEWBY, H. (1972) Agricultural workers in class structure, *Sociological Review*, 20, pp. 413–439.
- NEWBY, H. (1977) *The Deferential Worker: A Study of Farm Workers in East Anglia*. London: Allen Lane.
- NILSSON, J. and BARNHEIM, M. (2000) Remodeling a dairy producer cooperative, in: H.K. SCHWARZWELLER and A.P. DAVIDSON (eds) *Research in Rural Sociology and Development*. Bingley: Emerald Group Publishing, pp. 325–353.
- NISKANEN, K. (1998) *Föreställningar om kön: ett genusperspektiv på jordbrukets modernisering*. Stockholm: Stockholms universitet.
- O'HARA, P. (1998) *Partners in Production? Women, Farm and Family in Ireland*. New York: Berghahn Books.
- OAKLEY, A. (1972) *Sex, Gender, and Society*. New York: Maurice Temple Smith.
- OLSSON, L. (1994) Den vita piskan : om mjölkningens könsarbetsdelning under den agrara kapitalismen, in: A. JOHANSSON, S. LUNDIN and L. OLSSON (eds) *Dagsverken*. Lund: Historiska media, pp. 46–76.
- PANELLI, R. (2007) Time–space geometries of activism and the case of mis/placing gender in Australian agriculture, *Transactions of the Institute of British Geographers*, 32, pp. 46–65.
- PHILLIPS, A. and TAYLOR, B. (1980) Sex and skill: notes towards a feminist economics, *Feminist Review*, 6, pp. 79–88.
- PINI, B. (2005) The third sex: women leaders in Australian agriculture, *Gender, Work and Organization*, 12, pp. 73–88.
- PINI, B. and LEACH, B. (2011) *Reshaping Gender and Class in Rural Spaces*. Burlington: Ashgate Publishing.
- PLOEG, J.D. VAN DER and LONG, A. (1994) *Born from Within: Practice and Perspectives of Endogenous Rural Development*. Assen: Van Gorcum.
- PRICE, L. (2010a) 'Doing it with men': feminist research practice and patriarchal inheritance practices in Welsh family farming, *Gender, Place and Culture*, 17, pp. 81–97.
- PRICE, L. (2010b) The damaging impacts of patriarchy on UK male family farms, in: G. ROBINSON (ed.) *Sustainable Rural Community Change: Geographical Perspectives from North America, The British Isles and Australia*. Spokane: Eastern Washington University Press, pp. 61–77.
- PRICE, L. and EVANS, N. (2005) Work and worry: farm women's way of life, in: J. LITTLE and C. MORRIS (eds) *Critical Studies in Rural Gender Issues*. Aldershot: Ashgate Publishing, pp. 45–60.
- PRICE, L. and EVANS, N. (2006) From 'as good as gold' to 'gold diggers': farming women and the survival of British family farming, *Sociologia Ruralis*, 46, pp. 280–298.
- PRICE, L. and EVANS, N. (2009) From stress to distress: conceptualizing the British family farming patriarchal way of life, *Journal of Rural Studies*, 25, pp. 1–11.
- REIMER, B. (1986) Women as farm labor, *Rural Sociology*, 51, pp. 143–155.
- RILEY, M. (2011) 'Letting them go': agricultural retirement and human–livestock relations, *Geoforum*, 42, pp. 16–27.
- ROSE, H. (1983) Hand, brain, and heart: a feminist epistemology for the natural sciences, *Signs*, 9, pp. 73–90.
- SACHS, C.E. (1983) *The Invisible Farmers: Women in Agricultural Production*. Totowa, NJ: Rowman & Allanheld.
- SAUGERES, L. (2002) 'She's not really a woman, she's half a man': gendered discourses of embodiment in a French farming community, *Women's Studies International Forum*, 25, pp. 641–650.
- SCB (STATISTISKA CENTRALBYRÅNS) (2011a) *Jordbruket i siffror: åren 1866–2007: Tabellbilaga*. Jönköping: Jordbruksverket.
- SCB (STATISTISKA CENTRALBYRÅNS) (2011b) *Jordbruket i siffror: åren 1866–2007*. Jönköping: Jordbruksverket.

- SCHWARZWELLER, H.K. and DAVIDSON, A.P. (2000) Introduction: research agendas and foci of concern in dairy industry restructuring, in: H.K. SCHWARZWELLER and A.P. DAVIDSON (eds) *Research in Rural Sociology and Development*. Bingley: Emerald Group Publishing, pp. 1–12.
- SCOTT, J.W. (1992) Experience, in: J. BUTLER and J.W. SCOTT (eds) *Feminists Theorize the Political*. New York: Routledge, pp. 22–40.
- SHORTALL, S. (1999) *Women and Farming: Property and Power*. Basingstoke: Macmillan Press.
- SKS (SKOGSSTYRELSEN) (2013) *Skogsstatistisk årsbok*. Jönköping: Skogsstyrelsen.
- SVENSK MJÖLK (2012a) *Antal mjölkföretag*. Published online <<https://www.lrf.se/om-lrf/organisation/branschavdelningar/lrf-mjolk/statistik/mjolkforetag/>>, accessed 15 May 2012.
- SVENSK MJÖLK (2012b) *Mjölkinvägningens förändring länsvis*. Published online <<http://svenskmjolk.se/Statistik/Mejeri-och-konsumtion/Mjolkinvagningens-forandring-lansvis/>>, accessed 15 May 2012.
- TEATHER, E.K. (1994) The social and political organisation of rural women, in: S. WHATMORE, T. MARSDEN and P. LOWE (eds) *Gender and Rurality*. London: David Fulton Publishers, pp. 31–49.
- THOMPSON, C.J. (1996) Caring consumers: gendered consumption meanings and the juggling lifestyle, *Journal of Consumer Research*, 22, pp. 388–407.
- THOMPSON, P., WARHURST, C. and CALLAGHAN, G. (2001) Ignorant theory and knowledgeable workers: interrogating the connections between knowledge, skills and services, *Journal of Management Studies*, 38, pp. 923–942.
- TIETZE, S. and MUSSON, G. (2002) When ‘work’ meets ‘home’: temporal flexibility as lived experience, *Time and Society*, 11, pp. 315–334.
- TOMASKOVIC-DEVEY, D. (1993) *Gender and Racial Inequality at Work: the Sources and Consequences of Job Segregation*. Ithaca, NY: ILR Press.
- WAJCMAN, J. (2008) Life in the fast lane? Towards a sociology of technology and time, *British Journal of Sociology*, 59, pp. 59–77.
- WALBY, S. (1989) Flexibility and the changing sexual division of labor, in: S. WOOD (ed.) *The Transformation of Work? Skill, Flexibility and the Labour Process*. London: Unwin Hyman, pp. 127–140.
- WARHURST, C. and THOMPSON, P. (2006) Mapping knowledge in work: proxies or practices?, *Work, Employment and Society*, 20, pp. 787–800.
- YARWOOD, R. and EVANS, N. (2006) A Lleyn sweep for local sheep? Breed societies and the geographies of Welsh livestock, *Environment and Planning A*, 38, pp. 1307–1326.



Book Review

Nazi Hunger Politics: A History of Food in the Third Reich

Gesine Gerhard, 2015

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A lot has been written about the German Third Reich's incorporation of eugenics into their system of political administration. However, seldom has there been an exposé of the use of food by the Nazis in their racial cleansing operations. Gesine Gerhard's seminal book *Nazi Hunger Politics* delves into the machinations of Hitler's regime courtesy of Richard Walter Darré, the first Reich Minister of Food and Agriculture, and his protégé Herbert Backe who succeeded him in the same position. Across six chapters, the author insightfully links together the logistical and scientific aspects of food production and the feeding of the German masses with the Nazi ideological notions of unrestrained patriotism, racial superiority and purity, and eugenic pseudoscience.

Gesine Gerhard achieved her doctorate in Modern German History in 2000 and went on to author a respectable spread of book chapters and journal articles relating to the use of agriculture and food as political and hegemonic tools by the Nazis. Her prior work, such as 'Food and genocide: Nazi agrarian food policy in the occupied territories of the Soviet Union' (2009) and 'Breeding pigs and people for the Third Reich: Richard Walter Darré's agrarian ideology' (2005) effectively illustrate that food production and its supply served as a veritable double-edged sword that cut both ways; a 'green' and environmental agenda on the one side and a eugenically driven genocidal policy on the other. Hence, Gerhard was well poised for expanding upon her initial exploration of the Third Reich's ideological stance of 'blood and soil' and the resulting diabolical campaign of exterminating racial undesirables for purifying the Nordic race.

What is unique about this work is that the author doesn't rely only on pre-existing historical records and secondary accounts to construct her analysis, but actually taps into a hitherto largely inaccessible source of information to bolster her research: the personal diaries of Herbert Backe's wife Ursula, covering a two-decade period from 1927 to 1947. These allowed Gerhard to peer into the past through the eyes of someone who had an intimate day-to-day connection with the implementer of the *Hungerplan*. In the Introduction section, the author explains that even after getting permission from Backe's surviving children for exhuming their mother's diaries and letters from the Federal Archives, she still had to decipher the outdated *Sütterlin* German script that Ursula Backe chose to employ in her personal reflections and communication with her husband.

Chapter 1 thus starts off by nestling the issue of food in the greater state machinery of Adolf Hitler's regime and then seasons it by adding a layered mix of religiosity, patriotism, racial integrity and rural agricultural pride. Having whetted the

reader's appetite, the book then goes on to explain the significance of food politics in garnering support for the barbarous Operation Barbarossa that subjected the Russian populace to the Greater German Reich's ruthless reach. The author also points out here that Darré used notions of agrarian superiority and pride to mobilize the *Landvolk* (peasantry) through the annual harvest festival, where Hitler was virtually elevated to the status of a demigod through a very Caesarian crowning of a laurel wreath (p. 43). Joseph Goebbels was instrumental in propagandizing the cult appeal of the festival. Moreover, agrarian ideology was interlinked with military might, with a grand display of German military power.

In the second chapter, the reader is informed about the German preparation for World War II by using the food economy apparatus. Food was now seen as not just a means of feeding people but also as a weapon to be wielded by the Nazi regime for increasing their dominance, which would be asserted by depriving other people of sustenance. Chapters 3 and 4 then form the centrepiece of the author's research in Herbert Backe's role as the executioner of Nazi food politics, of which Richard Walther Darré was the architect. In these pages, Gerhard further builds upon her thesis that the Nazis' ideals of racial purity and eugenics stemmed from food and agrarian notions. She explains that Darré was able to successfully mobilize various rural and agrarian bodies and rally them together in their collective grudge and apprehension against the urban centres, that were marked by their industrial and capitalistic functioning. Key to this was the Agrarian Apparatus that controlled the farmers' associations and the Reich Food Estate (*Reichsnährstand*, or the RNS) that was the linchpin of the entire food system (p. 77). However, Gerhard goes on to point out that, ironically, it was the RNS that laid the groundwork for the industrial approach towards food production, leading to full-scale commercialization.

Chapter 4 essentially dissects the *Hungerplan* of the 'Greater Third Reich', detailing how it was used to convert hunger and food deprivation into a weapon that was used against the Russians at the start of World War II. Using quotes from prominent Nazi leaders such as propaganda minister Joseph Goebbels and Hitler himself, the author illustrates how the *Hungerplan* was the true face of Operation Barbarossa, making a mockery of the non-aggression pact that had been signed with Stalin in 1939 (p. 87). The author explains that it was Backe's doctoral expertise in researching Soviet agriculture that posited him squarely as the central planner of the exploitation of the land and natural resources of Russia and other regions of the USSR such as Ukraine, as well as European countries such as Poland, leading to the establishment of a continental food market. The author embellishes the tapestry of historical accounts with intimate insights into the workings of Backe's mind through the letters he wrote to his wife, boasting about the 'big thing' that he was going to achieve, contingent on general approval (p. 89). The eugenic stance against the Soviets, Jews and other members of the German society that were doomed for extermination through food deprivation is sharply brought into context by the author referring to them as 'useless eaters', quoting Rolf-Dieter Muller (p. 93). This I believe is the same racial ideology that has persisted into the twenty-first century and has become a cornerstone of contemporary food security programmes.

Since mass food production and its selective distribution requires extensive research and experimentation, it was enlightening that the author chose to dedicate Chapter 5 to Nazi food science. Hence, this chapter explores the marriage that was created between the pseudoscience of eugenics and the plant-breeding research at the various institutes run by the notorious Kaiser Wilhelm Society. On a side note,

one of the major backers and funders of the Kaiser Wilhelm Institutes was not even a German entity; the US-based Rockefeller Foundation invested a total sum of then USD125000 over a period of six years from 1929 to 1935 towards what it termed as 'new projects' (Adams, 2005, p. 243). The author also fascinatingly reveals that the Nazi food scientists were well aware of the direct correlation between not just the number but also the quality of the calories made available to prisoners in their diet and their labour output. It makes one wonder that if such ruthless experimenters had determined the drawbacks of nutritional shortfalls for human health, wouldn't the so-called Green Revolution planners also have been cognizant of this fact before rolling out their calorie-intensive approach to food security. Perhaps they or their backers, such as the Rockefeller Foundation, were pushing forward their nutrient-deficit crops and their subsequent processed end products by design. In fact, the author explores something similar along these lines in Chapter 6; the role of American entities in re-engineering the European market under the pretext of post-war recovery by increasing the influx of products made in the United States, especially courtesy of the Marshall Plan

The author also presents a telling account in Chapter 5 of how the Nazi notions of conservation translated into a love of all things nature. However, the author explains that their characterization of being 'green' was an ironic rationalization of their abhorrence for certain segments of their society, complimenting their overt ideals of racial homogeneity. Furthermore, she goes on to allude to the intriguing parallels between Nazi environmentalism and the current crop of nature conservation pundits. She cites many a debate having asserted that the modern climate change club is an ideological repackaging of Third Reich's duplicitous and even occult natural practices, such as the anthroposophic grounding of alternative and organic farming as advanced by Rudolph Steiner and secretly endorsed by Darré (p. 115).

Chapter 6 is an effective capstone to the book and is a testament to the adage that what goes around, comes around. The author posits the Nazi hunger policies in the historical aftermath of the Second World War, contextualizing their failure being due to the breakdown of national infrastructure and an inflow of refugees from war-torn areas that immensely burdened the already strained food provisions. It is aptly pointed out that even while held in captivity in the Nuremberg prison and undergoing his trials, Backe had no regrets about his *Hungerplan* and moreover extolled the virtues of National Socialism in his final letters to his wife. Yet ironically, he took his own life in April 1947, presumably due to fear of being tried (p. 125).

After having read it, the book reinforced my earlier realizations that most modern-day food security interventions seem to be fashioned along the lines of the Third Reich's food and agriculture policies. They are masquerading as environmentally sustainable projects for tackling global and regional hunger, all the while harbouring agendas of political and corporate control of the food system and robbing local people of their food sovereignty, health and life.

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References

ADAMS, M.B., ALLEN, G.E. and WEIS, S.F. (2005) Human heredity and politics: a comparative institutional

study of the Eugenics Record Office at Cold Spring Harbor (United States), the Kaiser Wilhelm Institute for Anthropology, Human Heredity, and Eugenics (Germany), and the Maxim Gorky Medical Genetics Institute (USSR), *Osiris*, 20, pp. 232–262.

GERHARD, G. (2009) Food and genocide: Nazi agrarian food policy in the occupied territories of the Soviet Union, *Contemporary European History*, 18(1), pp. 45–65.

GERHARD, G. (2005) Breeding pigs and people for the Third Reich: Richard Walter Darré's agrarian ideology, in: F.-J. BRUEGGEMEIER, M. CIOC and T. ZELLER (eds) *How Green Were the Nazis? Nature, Environment, and Nation in the Third Reich*. Athens: Ohio University Press, pp. 129–146.