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Annotated Bibliography

Research Question:
"What benefits to global sustainability and social equity can be gained through small scale poultry production and urban agriculture?"

1. Liu, Jianguo, et al. "Systems integration for global sustainability." *Science* 347.6225 (2015): 1258832.

This article gives a really good overview of thinking about sustainability holistically, which is exactly what I'm trying to get at. It talks about how the Earth is one large system, made up of smaller, very closely intertwined systems that interact and create feedbacks and ripple effects. Policy and research doesn't address this concept, choosing instead to just focus on one subsystem, to the detriment of their own goals of sustainability (1). The paper cites the Intergovernmental Panel on Climate Change as a good model of integrated assessment models, because they look at the interactions between climate change and acid rain, biodiversity loss, water scarcity, and ocean acidification (1). This article gives many, many examples of integrated systems for specific regions, such as hydroelectric damns in Boreal Forests in Canada (6), and deforestation of Giant Panda habitat in China (7).

This paper really discusses the need to develop integrated analyses when discussion sustainability, taking into consideration the human-nature nexuses, feedback loops, spillover effects, and the many interactions between systems that produce often overlooked effects, effects with unforeseen consequences (3). Additionally, this article stresses the important of how we think about the components of systems, and how we classify which are internal and which are external. They cite a study in China that looked at a food-water nexus, but didn't look at groundwater extraction's greenhouse gas emissions, which led them to a conclusion that was 33.1 megatons of carbon dioxide equivalent off of the accurate GHG emissions they were attempting to calculate (5).

One of the most useful sections of this article for me, would be the discussion on scale, and how "many urban sustainability efforts focus on locally specific solutions that may not be scalable" (7). This is very important; because one of the many arguments in favor of large modern farms and factory-farmed livestock, is that it has the ability to feed many people and can do so very efficiently. One or even a couple urban productive spaces will not be able to feed as many people as a single modern mega-farm, and can't be scaled to the same size. However, this is part of what makes urban agriculture more sustainable than these kinds of farms. Scaling down the size of farms and increasing the number of farms in operation, while putting these small productive spaces in close proximity to the consumers, allows urban farms to drastically cut down on the amount of inputs needed to operate their farms, the amount of fossil fuel driven machinery to plant and harvest food, and the amount of transportation needed to deliver food to the people that will be eating them.
The basic concepts of integrated sustainability discussed in this paper are analyzed in depth and applied to the global food system in Reisch et al., included in this bibliography.

1. Reisch, Lucia, Ulrike Eberle, and Sylvia Lorek. "Sustainable food consumption: an overview of contemporary issues and policies." *Sustainability: Science, Practice, & Policy* 9.2 (2013).

This article delves into the sustainability of modern global food systems, especially looking at an integrated approach to sustainability, taking their definition much further than the typical definition. This integrated approach bears striking similarity to the Liu et al. paper cited in this bibliography, especially when it discusses the "energy-food-water nexus" of the modern food system (7). One of the definitions of sustainability that they cite as a very comprehensive and holistic view of sustainability is the UK Sustainable Development Commission's lengthy but thorough definition, which reads "'sustainable food and drink' as that which is safe, healthy, and nutritious for consumers in shops, restaurants, schools, hospitals, and so forth; can meet the needs of the less well off at a global scale; provides a viable livelihood for farmers, processors, and retailers whose employees enjoy a safe and hygienic working environment; respects biophysical and environmental limits in its production and processing while reducing energy consumption and improving the wider environment; respects the highest standards of animal healthy and welfare compatible with the production of affordable food for all sectors of society; and supports rural economies and the diversity of rural culture, in particular by emphasizing local products that minimize food miles. Other researchers have also pointed out that sustainable food styles must fit into people's everyday lifestyles (i.e., must be 'feasible', available, affordable, and accessible) and should allow for socio-cultural diversity." (8). The authors spend the first half of the paper going over the issues in the major components in the global food system (ecology, sociology, ethics, health, and economics) and then follows up on these brief analyses with high priority policy options for each key component.

The authors state that modern food production has become much more globalized, more industrialized, and increasingly standardized and intensified, while traditionally seasonal crops are being made available year round, bringing about serious consequences, including the so called "farm crisis"(8-9). The "farm crisis" is a trend of modern farms becoming more and more concentrated, creating incredibly large farms that are collectively owned and operated by a very few number of farmers, while small farms are growing at a heavily reduced rate, both in quantity and size (9). This farm crisis is very worrisome for a few reasons, primarily for it's impact on the local farm market, driving up the number of "food miles" associated with a crop, as well as an increase in mono-cropping and it's associated impacts (increased need for pesticides and herbicides, soil degradation, increased fertilizer application and subsequent eutrophication of water bodies, flooding the market for that crop and driving down the sale price, increase in the quantity and severity of pests and disease, and harming foreign markets for these crops) (9). I believe that many of these harmful impacts on the world can be mitigated and avoided if we move away from massive mono-cropping farms, choosing instead to subsidize small farms that employ traditional farming techniques that pair symbiotic crops and rotate crops through different fields strategically to protect soil health and grow healthier, more nutritious foods for the public to consume, rather than a single cash crop to sell in bulk to food processing companies.

Another important topic raised by this paper is the rising cost of the inputs associated with modern agriculture, driving up the price of food for consumers. The paper cites that in the European Union, “the price index for food rose by almost 20% between 2005 and 2012”, which can reduce access to produce and unprocessed foods for low-income households and consumers (15). They also discuss the traditionally higher cost of food associated with organic produce (17% higher on average) (15). To combat this mark up on organic and sustainable foods, many European food retailers and cities have taken steps to bring down those costs for producers, for example, Coop, a Danish company, eliminated the sales-price difference between organic milk and conventional milk, which brought about “an early breakthrough of organic products in Denmark” (15). This is an important part of the urban agriculture and sustainable food movement world wide, shifting pricing, subsidies and demand away from conventional foods and towards sustainable or organic ones.

2. Ussery, Harvey. The small-scale poultry flock: an all-natural approach to raising chickens and other fowl for home and market growers. Chelsea Green Publishing, 2011.

This book came at the recommendation of my faculty advisor Beth Wheat, who swears it is the best book about raising birds on a small scale. I plan to use this source as a resource mainly for the mechanics of raising chickens on a small scale, and less on my actual research on the implications of raising chickens on a small scale. This book has provided me with a lot of information about the sustainability of raising chickens on a small scale, in terms of the animal welfare and very direct environmental impacts of raising hens, like waste management, amounts of feed, water use, etc. This book details many of the small-scale production techniques used to raise healthy hens in a sustainable fashion, such as "deep litter", which could serve as a "best practices" guide for small-scale poultry producers.

"Deep-litter" as described by the book, is a method of providing bedding and ground cover for hens, and then adding bedding over top the fouled bedding, allowing the chickens to scratch their manure into a high carbon litter, which will eventually turn into a very high quality compost. The process starts with the high carbon, low nitrogen litter, usually wood chips or wood shavings, which is used to insulate the coop, manage waste, and keep things comfortable for the hens. The hens do what hens do, poop on the litter and then scratch at it, mixing the two and breaking down their manure. New bedding is added on top of the old bedding, and as the chickens scratch at it and time passes and even more litter is added, beneficial bacteria and helpful microbes begin to inhabit the deepest sections, improving the immunity and health of the birds. The deep litter compost can be removed and used in gardens as well, improving the health of the soil and adding tons of organic nitrogen and carbon (80-86). Deep littering a small flock of hens is an incredibly beneficial way to manage the waste produced by chickens, while also improving their healthy and creating organic soil amendments. This type of compost would greatly benefit the sort of closed loop crop production/poultry production/NCAP production system I described in the Ncobela annotation.

3. Vaarst, Mette, S. STEENFELDT, and K. HORSTED. "Sustainable development perspectives of poultry production." *World's Poultry Science Journal* 71.04 (2015): 609-620.

This article gets at the main points made by myself and others, that an in-depth analysis on the sustainability of small scale poultry production, using a framework that keeps in mind the entirety of the Earth systems, like the ones discussed in Liu et al. and Reisch et al, is greatly needed. The author states in the introduction that "this sector is part of a global food system, and a systems approach is necessary" (609). Clearly, it is a common theme among many academic articles concerning poultry production that there is a pressing need to understand the possible sustainability of poultry production using a systems approach that adequately addresses how complex the global food system impacts the various aspects of our Earth and lives. Karen Litfin made a note in her article on Gaian systems that the food system has major negative impacts, but is incredibly necessary for our survival as a species, thus must be made more sustainable if we wish to feed ourselves and prevent the major disruption of our environment and Earth systems. This article contributes to that idea, as well as blends ideas brought up from Litfin, Liu, Reisch, Hovorka, and Drechsel.

Right out of the gate, Vaarst states that chickens "can fit into urban and peri-urban production, and in many parts of the world they generate income over which women have control" (610) and that "poultry production has been and still is a type of production in which women are heavily involved throughout the world especially on individual, family and/or small-scale farms" (614). This brings Hovorka to mind, especially Hovorka's ideas that urban agriculture and small scale poultry production has the power to uplift women financially and socially, as well as improve gender dynamics in many regions of the world where women are still impeded from retaining control of their own money or property. It also brings to mind the Population Council's work in Sub-Saharan Africa to reduce the rates of child marriage by providing families with chickens or goats, easing their economic incentive to marry off their daughters at a young age.

Vaarst includes an entire section on the institutional aspects of sustainability, in which they cite The United Nation's 1992 Rio Declaration, which defines institutional sustainability as "the control and governance of global systems and ensuring that that the institutions are accountable, transparent and open to it's members and representatives" (615). This section argues that often times there are policies that aim to improve economic development or sustainability, which in turn undermine policies to promote social welfare or sustainability. Vaarst is making the case for a more coordinated effort to pass and promote policies that work in tandem with each other, addressing the systemic nature of food systems, rather than separate and clumsy policies attempting to address just a single aspect of the food system.

1. Ncobela, C. N., and M. Chimonyo. "Potential of using non-conventional animal protein sources for sustainable intensification of scavenging village chickens: A review." *Animal Feed Science and Technology* 208 (2015): 1-11.

This South African article goes in-depth on alternatives to conventional commercial feed as a source of protein for chickens. The article states that traditional feed is often prohibitively expensive for many households raising chickens, especially ones in rural villages, and with the price of feed on the rise, this problem is only expected to get worse (2). Ncobela lists many of the common Non-conventional animal proteins (NCAP) available in Southern Africa, namely earthworms, maggots, termites, snails, grasshoppers, and silkworm pupae caterpillars, and states that these sources of feed had very high protein contents, ranging from 380 to 650 g/kg (2). Because protein in the most limiting and expensive nutrient to provide to chickens in many cases, finding affordable alternatives to traditional feed is critical to the long-term viability of small, urban, and/or rural farmers. Ncobela notes the rising demand for organic products, and cites an article that showed that chickens raised on grasshoppers, rather than traditional feed, had tasted better and fetched higher prices at market (2).

Ncobela detailed the nutritional quality and feed management of each of the most prominent NCAP sources, but the two I am most interested in are Earthworms and Snails, because they are the two most likely NCAP sources to be raised by students on the UW Farm. This is relevant to my capstone because one of the things my site supervisor and I discussed multiple times were projects related to the chickens that can be taken on by future student farmers and capstone students, and one of the most talked about projects was raising NCAP sources on the farm for chickens, allowing the farm to drastically cut down on the amount of feed purchased for birds, as well as the associated water and GHG emissions associated with traditional feed. These NCAP sources are also incredible relevant to the accessibility of small-scale chicken production all around the world, especially where traditional feed costs would be prohibitive. By promoting NCAP sources in addition to urban agriculture and small scale poultry production, the whole system can become a closed loop and much more sustainable. Earthworms can be raised from the soil and organic waste produced by the farm, those worms can be periodically harvested to be either fed to the chickens or processed and bulked for later feeding, while the remaining worms will produce incredibly beneficial worm casings for the farm, meanwhile the chickens will feed on the worms and other organic matter from the farm, then fertilize the soil and remove further pests, further improving soil health for the production of crops, which will produce more organic waste for the worms, and so on and so forth. NCAPs can close the loop in the urban agriculture/small scale poultry production cycle, creating a crop production/poultry production/NCAP production system that will sustain itself with little to no additional inputs provided by the farmer other than labor, increasing their profits and uplifting them economically and potentially increasing their social standing. For women farmers all over the world, NCAPs could be a key in elevating their economic and social status, as well as providing them with very nutritious organic produce, meat, and eggs.

6. Grover, Himani, and Supreet Wahee. "SUSTAINABILITY THROUGH URBAN FARMING: A CASE STUDY ON PRIYANKA AMAR SHAH - WOMAN ECOPRENEUR." *International Journal of Retailing & Rural Business Perspectives* 2.3 (2013): 600-03. Web. [Peer reviewed 5/7] [MLA]

This is a case study of an urban farmer in India, Priyanka Amar Shah. Priyanka is a "ecopreneur", and created an app called iKheti, a service for urban farming in Tier 1 cities in India. The paper begins by detailing the wide benefits of women running their own businesses — "women entrepreneurship has been recognized as an important contributor to economic growth and well-being of community", as well as job creators (pg. 600). The paper recognizes the often detrimental environmental impacts associated with business, and introduces the idea of "ecopreneurship", a business practice that capitalizes off of environmental issues to create solutions and foster environmental health.

In India, agriculture makes up 14% of the GDP and 60% of the population relies on it. There is a quickly growing demand for organic foods and produce in Tier 1 Indian cities, and Priyanka Amar Shah developed a business model to capitalize on that demand, while also empowering communities to become more self sufficient and more sustainable (pg. 601). Priyanka founded iKheti, a business that caters to urban gardeners in need of the basics and corporate clients that would like a garden or edible landscape created and maintained on their property. Priyanka's business continues to grow, with the hopes of explained to Tier 2 Indian cities in the near future. Her work is a perfect example of an environmentally, economically, and socially sustainable business, empowering both her and the communities she caters to, while improving the environmental health of these cities.

This article provides a real world and very personal example of how urban agriculture can uplift women both financially and socially, drawing on similar themes as the 4th sustainability pillar named in Drechsel, about the profitability of urban agriculture. Clearly, urban agriculture, small livestock included, is profitable on it's own, and can even be expanded into a business model beyond just the selling of produce.

7. Drechsel, Pay, and Stefan Dongus. "Dynamics and Sustainability of Urban Agriculture: Examples from Sub-Saharan Africa." *Sustainability Science* 5.1 (2010): 69-78. *ProQuest.* Web. 11 Feb. 2016.

This article discusses the sustainability of urban agriculture on vacant properties in Sub-Saharan Africa, primarily in Dar es Salaam, Tanzania. The article goes into the FESLM's 5 pillars of sustainable land management, and how urban agriculture does in these 5 pillars (pgs. 73-76). In the first pillar, "Is urban crop production able to maintain or enhance land productivity?" Drechsel states that yes, based on the longstanding history and use of the same plots of land sometimes for over 50 years, urban farming is sustainable in the first pillar (pgs. 73-74). The second pillar, "How does urban crop production cope with production and eviction risks?", is also passed, due to the highly resilient and adaptable nature of urban agriculture in Dar es Salaam (74). When farmers are evicted from a space or when the land is developed, an equal amount of productive space inevitably pops up somewhere else in the city or in the borders of the city. For the third pillar, "Is urban crop production environmentally sound and does it not affect human health?", once again urban agriculture passes this sustainability pillar. Due to limited funds, farmers have become adept at conserving agricultural resources, such as soil and seeds. However, urban farming doesn't come without cost — contaminated water is often used to irrigate crops, creating potential health risks for consumers. To remedy this, many cities are working with their local urban farmers to find alternatives to irrigating with contaminated water, such as finding available space with cleaner groundwater, or reserving a portion of clean municipal water for crop production (pgs. 74-75). In the fourth pillar of sustainability, "Is urban crop production profitable?", the answer was a resounding "yes". The typical monthly incomes for urban farmers can vary between 35 US$ - 85 US$ for farmers, sometimes even higher. This model of farming is profitable because urban farmers can very easily and efficiently fill the demand for fresh produce in large cities, without added costs of transportation or many of the large investment costs that are associated with rural farming. Many urban farmers, especially ones with the ability to irrigate their crops throughout the dry seasons, are often able to support themselves above the poverty line, solely through urban crop production. This offers many opportunities to individuals who may not have a specialized skill set to make a career out of (pg. 75). In regards to the final pillar, "Is urban crop production socially and politically accepted?", the answer seems to be very regional. Some places, like Cairo, urban agriculture is frowned upon and suppressed because many officials believe it makes the city less inviting to tourists and less modern looking. However, some places take on a more relaxed view of urban farming, usually just allowing farmers to go about their business. Some places go far beyond just tolerating urban farming, but actually celebrating it, like in Senegal where urban agriculture and green spaces are being protected and developed further (pgs. 75-76).

The article closes with the sentiment that while there are some logistical concerns for urban farming, it offers a vast pool of untapped potential for cities all over the world, especially as cities grow and wealth disparities become more prominent. Drechsel makes a compelling argument for urban agriculture's potential to uplift people in heavily urban settings, especially marginalized people in urban food deserts, as well as the many potential benefits to social and

economic standing of these peoples and the benefits to the environment and green spaces of urban cities

8. "Building an Evidence Base to Delay Marriage in Sub-Saharan Africa." Population Council: Ideas. Evidence. Impact. Population Council. 25 Feb. 2016.

This article comes from the Population Council's work on attempting to incentivize families in Sub-Saharan Africa to not marry off their daughters as children, by providing them with either chickens or goats. The Population Council cites poverty as one of the biggest reasons why many families marry off their daughters anywhere from the age of 12 to 17, because they need the dowry. Unsurprisingly, this can have very serious negative impacts for these girls. Many of these girls do not have a choice in the matter of their marriage, with 95% of girls surveyed claiming that they did not know their husband before the union, and 85% not having even been told that they were to be married. These marriages expose girls to many risks, including a heightened risk for unwanted sexual contact, heightened risk of contracting HIV or other STIs, and increased risk of unintended pregnancy. Arguably one of the most shocking and upsetting statistic to come from this study is that more than 66% of married girls reported that they had sex for the first time before they had even started menstruating. Add all of this with the fact that more than 1 in 10 girls in Sub-Saharan Africa are married before the age of 15, and a very grim picture begins to be painted in this article. However, the Population Council's efforts to end child marriages all around the world have proven somewhat successful. By offering Ethiopian girls 2 chickens for every year they remain unmarried, girls were half as likely to be married by the end of the study compared to the baseline. Families that were offered a goat to keep their daughters unmarried and in school during a two year study period brought down the likelihood that their daughter would be married as a child by 90%. By offsetting the desperate economic need that many of these families face with small livestock to provide income, many of them are able to forgo marrying off their daughters as children, protecting them from the many risks they'd otherwise face.

This article isn't actually part of my 10 print sources, as I haven't been able to find the Population Council's original research or their raw data or methodology, but I found it to be pertinent to the broader picture of how poultry production can promote equity, so I wanted to include it. This data should be taken with a grain of salt in my opinion, but the themes expressed within remain the same — girls are often married to adult men because their families can't afford not to, so providing sustained economic relief to these families in the form of hens can help keep them from having to marry off their daughters, to the benefit to the girls, the families, and the entire community.

9. Litfin, Karen. "Thinking like a planet: Gaian politics and the transformation of the world food system." *Handbook of Global Environmental Politics* (2012): 419 - 430.

This article, written by University of Washington professor Karen Litfin, described “Gaian theory”, described in this text as “an interdisciplinary scientific perspective that understands Earth holistically as an integrated, self-regulating biogeochemical system” (419). The paper addresses the need to “harmonize human systems with the Earth system”, which is something I’ve been trying to address in this capstone as well (420). While modern methods of raising chickens and eggs have led to massive environmental consequence, there is still a demand for these products, and we must find a way to provide them in a way that doesn’t harm the planet on such a devastating scale. I argue that one way to do this is to raise chickens in many small flocks, raised by individual families and communities locally and in cooperation with the environment, rather than a few giant flocks, raised in a manner that degrades the environment. Litfin argues that because human systems are producing global environmental changes, we need to find and improve the systems that are causing the most harm, namely the food system (420).

The world food system, according to Litfin, is the only system that causes the most harm to the planet while remaining such a necessity to human life, but it is also a system that is able to be changed for the better (425). Litfin describes the oil intensive nature of the modern food system, highlighting the fact that virtually all of the machinery that plants, tills, harvests and transports the food is run on oil, and most of the added chemical pesticides and fertilizers are petroleum derivatives (426). She also mentions the much less notorious problem of nitrogen cycle disruptions, in which humans have taken nitrogen from the atmosphere and, using large amounts of fossil fuels, have fixed it into chemical fertilizers to replenish the nitrogen taken from the soil during the process of modern agriculture. This fertilizer runs off of the fields it is applied to, eventually running into rivers and the sea, leading to eutrophication and freshwater pollution (426).

This article is a really good piece about everything that is wrong with the current food system, especially in a holistic sense, similar to Liu’s article on global sustainability. This article stresses the need to think as a piece of a larger, complete system that encompasses the entire Earth and all of the subsystems that comprise it. It also digs into the social ramifications of our current food system and reliance on oil as a fuel, mentioning the 2008 food riots in 40 countries around the world, which was due to food shortages caused by inefficiencies in our system and the conversion of cropland to corn for biofuels (427). Her ideas for intervention points in this system include organic farming, purchasing local produce, “transforming waste into fertility” through composting, and improving soil health to capture carbon (428). Her focus on local farming can be taken further, in my opinion, to encourage the practice of urban farming, raising food at home, and especially raising small scale livestock at home, reducing the collective dependence on fossil fuel intensive systems of modern agriculture.

10. Hovorka, Alice J. “Urban Agriculture: Addressing Practical and Strategic Gender Needs”. *Development in Practice* 16.1 (2006): 51–61.

This article addresses the ways in which urban agriculture and raisin livestock in a small, urban setting can be incredibly beneficial, especially for women, who already face added burden due to misogynistic attitudes and practices prevalent throughout the world. They cite the general benefits of urban agriculture as “contributions to household food supply, budgetary expenditures, and nutritional intake, particularly during times of hardship” (51). This paper seeks to consider urban agriculture as a means to uplift, empower, and improve the lives of women, by “facilitating women’s ability to combine successfully their multiple roles in subsistence production, income generation, and environmental management” (51).

This paper stresses the need to examine whether urban agriculture initiatives will act as a burden or a benefit to women, and the author cites Rakodi’s caveats as an example of similar concerns. Rakodi “notes that ‘to advocate that women spend more time gardening may impose additional burdens on an already long working day’”, but she also notes that “it may be a productive use of time which they would welcome” and that “benefits to women from urban agriculture for women with those opportunities that may be offered by other development initiatives” (52). Another researcher, Sanyal, states that urban agriculture may simply reinforce the social and economic structures that currently exist to the detriment of women and the impoverished (52). In response to these critiques, Hoyorka asks “does the support and promotion of urban agriculture risk reproducing, or at least leaving intact, the circumstances of social inequality that give rise to the activity in the first place?” (52). One of the reasons why women go into urban agriculture in the first place is because the opportunities afforded to them in the work force are limited, due to marginalization because of their gender. The paper asks if promoting urban agriculture really just capitalizes on the ingenuity and will to survive of these women, giving them more labor rather than addressing the larger systemic misogyny that marginalizes them (53). Worries arise over the formalization of urban agriculture, due to these suppressive systems of power that keep women economically and personally marginalized. If urban agriculture becomes more legitimized, it may be harder for them to enter those spaces, and may be harder for them to retain their profits (53).

This paper seems to coincide well with the Population Council’s report on how providing livestock to families in Sub-Saharan Africa can empower girls and young women by allowing them to remain unmarried until they’re adults. Urban agriculture may be a very powerful tool in protecting and uplifting women all over the world, from girls in Sub-Saharan Africa, to women in India like Priyanka Amar Shah, discussed in the case study above. The article describes a woman named Joan in Botswana, who raised chickens in her backyard for food, and later moved her flock to a city subsidized “poultry plot”, took agriculture classes at the Botswana College of Agriculture, and formed a successful small scale poultry enterprise, to which she credits her economic security and empowerment (55). Similar stories from other women using poultry as a means of economic empowerment and community engagement, as well as a means of gaining

social status in some cultures, are detailed in this article. However, it does provide very strong counter arguments to the case of female empowerment through agriculture, such as in the above statement regarding legitimization and "de-feminizing" the urban agriculture space. If urban agriculture and raising livestock on a small scale becomes more "main stream" and accepted, there is a very real possibility that those spaces will become harder to access for women and the groups that need them the most. It may be a similar phenomenon as to the one in which wealthy Westerners take interest in a traditionally "poor" food staple, such as quinoa, then drive up demand and the price of the food, making it inaccessible to the populations that need it the most. This is a perspective that I should absolutely keep in mind during my further research into the possible benefits of raising hens on a small scale to women and other marginalized groups.

4. Jacobs, Peter, and Thembi Xaba. "Women in urban and peri-agriculture: Sustaining livelihoods in the Cape Metropolitan Area." *Agenda* 22.78 (2008): 186-197.

This article looks at the extent and effects of women practicing urban or peri-urban agriculture in the Cape Town Metropolitan area in South Africa, examining if the traditional social norms and farming practices associated with urban or peri-urban agriculture apply to women in the field as well.

This article states that "modern cities usually source their non-processed staple grains, vegetables, fruits and animal products from farms located outside urban zones" and that "cities fit largely on the demand or consumption side in a country's agro-food equation" (188). The authors claim that while there are many infrastructural and logistical reasons why agriculture has usually remained outside of cities, there has been alterations "to the agro-food chain of urban zones in the last decades", and that people that have been marginalized or fall into lower socio-economic classes, especially poor women, have been practicing urban agriculture and small scale livestock production within the cities themselves (188). They cite a 2006 study that claimed that during the 1990s, "800 million urban farmers were producing 15% of the world's food" and that because that article is now over a decade old, that estimate is likely low (188-189).

The article also delves into some statistics about urban farming in different cities all around the world, statistics that I have found hard to come by for some regions. According to the paper, "76% of the vegetables supplying Shanghai is produced within 10 km of the point of sale, and in Beijing, the figure is estimated at 85%, with 79% of fruits coming from peri-urban areas. Intensive vegetable and fruit production is also a widespread livelihood option for urban populations, estimated at 31% in urban Beijing and 64% in the peri-urban areas. (Lee-Smith & Prain, 2006)" (189). Havana, Cuba and Lima, Peru had 40% and 15%-20% respectively in terms of percentage of urban farming being a livelihood for residents (189)

Jacobs and Xaba devote an entire 2.5 page section strictly to a detailed analysis of gender equity and urban agriculture (190 - 192). They report that globally, women are more likely than men to be engaged in urban agriculture, and that women farmers in cities mostly come from low-income homes. They claim that women use urban agriculture as a means to handle short-term life concerns and to overcome long-term economic and/or nutritional vulnerability. They criticize Sumberg's notion that women have to farm in response to "the unreliability of their menfolk", stating instead that women farm in response to the "structural forces that underpin gender inequalities in African society, usually justified under the thin veil of customary rules" (190). This assertion is an important one, as it frames women in agriculture not as a response to a few lazy men, but as a response to systemic misogyny that casts women as caregivers and laborers, and men as the enjoyers of the fruits of such labor. This article also looks at the role of class in some regions of urban agriculture, and note that in some cases, elite land owning women use

poor men as cheap labor to profit from. This is an angle rarely mentioned in articles concerning gender inequalities in urban agriculture, but it is an important angle to acknowledge, as it highlights the large role that income inequality has to play in gender inequality. While this article touches on many important points concerning the equality of women in urban agriculture, it does not take an in-depth look into the possible drawbacks of encouraging women into urban agriculture, as discussed thoroughly in Hovorka's article, annotated in this bibliography.