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Urban Gardening Realities: The Example Case Study of Portsmouth, England

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ABSTRACT

This paper offers an empirical case study of the potential for urban gardening to contribute to individual food security. Food security generally encompasses both availability and accessibility. In Western Europe, availability *per se* has declined in importance with the development of national and international transportation networks. During the past decade, urban gardening has gained political currency as a strategy to provide greater food security at the local level. However, prevailing economic and social structures hamper the likelihood that urban gardening might offer much greater food security. Realistically, contemporary urban gardening most closely resembles a middle-class pursuit for personal enjoyment.

Keywords. affordability, food security, food supply, Portsmouth, urban gardening

1 Introduction

During the past 15 years, food security has become a prominent public policy issue as food prices are increasing steadily, and perceived safety of food has deteriorated as scandals such as the 2013 horsemeat burgers and others began to surface in England. The concept of growing one's own food has re-emerged in urban areas during the past decade, on the popular belief that safer and less costly food could be produced locally.

The term "food security" has also been used frequently in the promotion of local food production. Most broadly, food security encompasses availability and/or accessibility (Pinstrup-Andersen, 2009). Availability indicates the supply of food at any price level, and accessibility refers to the inherent affordability of available food. For both availability and accessibility, quality and nutrition are generally considered to be secondary characteristics of food security. Interestingly, English consumers are still largely confused and uncertain about the meaning of "food security" (Kneafsey et al., 2012).

Many critical issues pertaining to local food production have largely been ignored by civic politicians and others in respect of understandable apprehensions held by concerned middle-income citizens. Some of the perplexing questions include: Is there such a crisis in food security that it would warrant intensified promotion of local food production? Is there sufficient land available to support localized food production in the form of urban gardening? Does the contemporary societal structure support citizen efforts to produce their own food? Could such local production effect a significant difference over the shelf-edge cost of food available in supermarkets to ordinary purchasers? Does local production of vegetables have a lower carbon footprint, in view of prevailing climatic conditions?

This paper examines such realities - and limitations - of local food production in modern day England. Portsmouth is used to illustrate the various elements of this pursuit, particularly in the form of urban gardening in city-allocated urban plots.

2 Portsmouth geography - basic characteristics

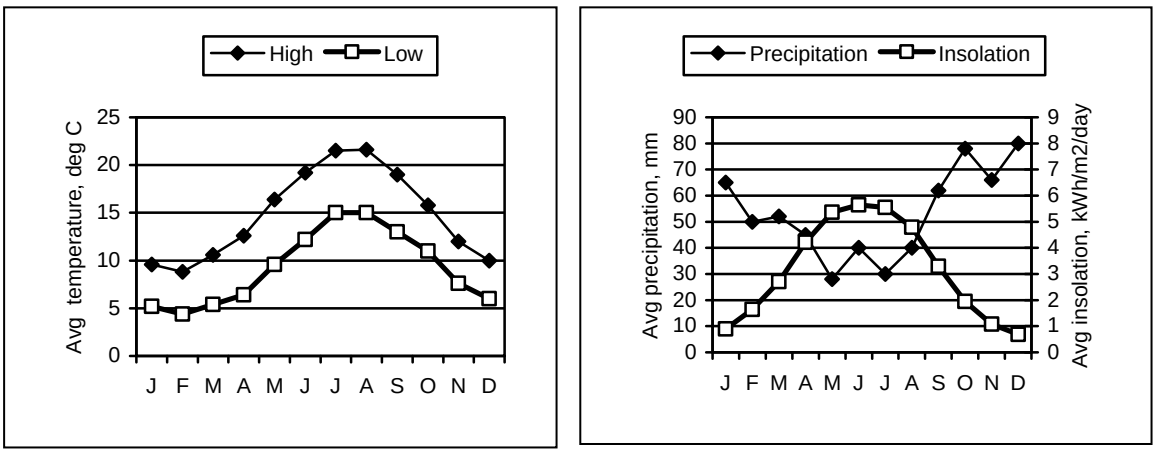
The basic settlement statistics of Portsmouth are given in Table 1: note, especially, the high population density and attendant lack of "vacant" land. As shown in Figure 1, the climate of Portsmouth suggests that urban gardening for most produce is only marginally feasible. The average maximum temperatures reached only during the two 'hottest' months of July and August are generally insufficient for the growing many hot-climate vegetables such as tomatoes and bell peppers. The ideal temperature for optimum growth of these tropical crops is between 20 and 28 degrees Celsius.

Table 1.

Selected Portsmouth city statistics on population and area

	Portsmouth (50.77°N 1.08°W)	
City population (2011) Area, km^2 Apparent density, persons/km^2	207,000 40.25 5,143	
Land use (within city limit; 2001 data*)	km^2	% of total
Single/Multiple family dwellings	11.59	29
Commercial/Industrial and utilities	2.72	7
Parks or public services	13.77	35
Vacant	Not available	(probably <1)
Streets, lanes, sidewalks/pavements	6.68	17
Other	5.03	12
Total	39.79	100

Notes: latest available data source from http://www.visionofbritain.org.uk/



Source: UK Met Office 2013; ASDC 2013 (for incident solar radiation data only)

Figure 1. Selected monthly averaged climate parameters of Portsmouth.

3 Historical patterns of land use

As a historic naval port, Portsmouth has, perhaps inevitably, developed atypically since its designation as a city in 1180 CE. For military defence reasons its major open space, Southsea Common, has remained largely untouched over the centuries. The growth of the British navy had led to rapid urban expansion with much of the housing stock built as terraces with very small gardens – though every possible patch was later cultivated under wartime "Dig for Victory"* pressures. It has for some years been formal national

* It has since been suggested that the "Dig for Victory" campaign was conducted largely to boost the morale of the people in the home front during World War II. Provision of fresh food was of secondary priority.

housing policy that, in order to increase the supply of land for new housing, large mature gardens should be viewed as suitable land. Accordingly, many of the gardens that supplied food under "Dig for Victory" program have now disappeared – a trend that continues.

4 Food security

During the past decade, interest in local food production among medium-high income citizens has risen notably in the temperate regions of North America and Western Europe (Onken and Bernard 2010). A recent survey of over 1,000 representative British shoppers has reported that more than 50% of the respondents were supportive of local producers (Halliday, 2010).

Food affordability is not a relevant issue for English citizens of average disposable income. Portsmouth itself is a moderately prosperous city that has diversified away from reliance on the naval dockyard. The recent ending of shipbuilding locally has confirmed that military-related business is not entirely recession-proof. Beyond that, it has experienced much the same trends as in England in general over the last 3 decades: a small elite are seeing substantial increases in wealth: the vast majority – notably the young and retired – are seeing incomes falling ever further behind. So, as in England generally, food security now generally focuses on the declining accessibility of quality nutritious food by lower-income citizens. Contemporary exhortations to avoid cheap food, all too often neglect the underlying elements of unequal incomes and attendant ability to pay.

Food availability *per se* is not expected to be a critical issue in view of the existence of extensive national and international transportation networks. In the age of globalization as fostered by the steady growth of large trans-national corporations, development of local food supply as a national goal is of no geo-political relevance. In the historical context of food, the extensive work of Atkins (e.g., 2003, see also Atkins and Bowler, 2001) is well known. In essence, there are no obvious food security issues, viz., availability and affordability, in Portsmouth. The current driving force for "local production" thus largely reverts to the peculiar interest of the prosperous English middle class.

5 Local-ness

The geographic definition of "local" in local food production is still largely arbitrary (Feagan, 2007; Jeswani, 2009; Hand and Martinez, 2010). Such elasticity in the definition of "local" prevails because it tends to map onto local political geography. For the island City of Portsmouth, this boundary could only extend northwards well beyond the city limits, into the Hampshire countryside and beyond. Thus, produce supplied from Yorkshire could be considered "local", in contrast to the "non-local" goods delivered from Normandy (France). Yet the road travel/time distance to both is essentially much the same.

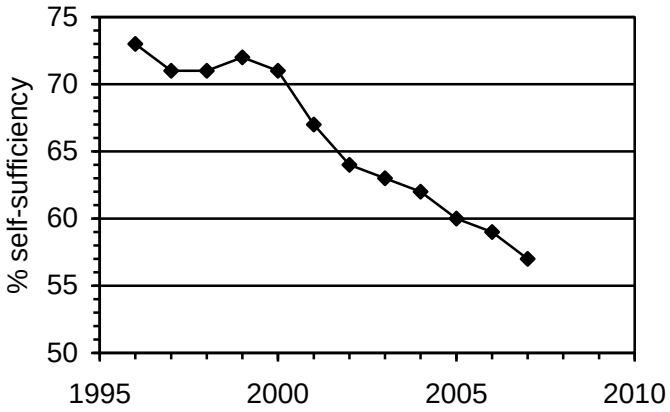
6 Urban gardening

Urban gardening involves non-staple food agriculture within city limits. In the context of local food production, staple cropping and meat production are generally excluded because of the relatively large land base required. Urban gardening may be undertaken in private household lots, or in community plots allocated by city governments. It is often promoted as an alternative to the long-distance supply of fresh vegetables (Grunert, 2011) and as a mean to increase local self-reliance. Improving health and nutrition of citizens via the availability of "fresher" local produce has also been cited lately as an outcome of urban community gardening (Dixon et al., 2007). Many of these lofty outcomes may be just wishful thinking. The issue of greater self-reliance has little or nothing to do with household budgets as the principal determinant of grocery buying decisions. "Fresher and more nutritious" locally-grown food is equally meaningless. For example, tomatoes harvested from heated greenhouses in Kent may have the nearly the same transit age as those harvested in Alméria (Spain) fields when the goods are finally displayed on the shelves of supermarkets in Portsmouth. Uniform distribution timing is largely regulated by the logistics at large Regional Distribution Centres (RDCs) operated by large supermarket multiples. Thus, local supply (even if available) might have the same transit age as foreign supply.

7 Food supply

Given the pattern of human settlement in Portsmouth during the past few centuries, its supply of "fresh" foods is generally imported from distant farms, though some is available from nearby Sussex (though, again, usually after it has travelled to a distant RDC). Accordingly, supply of fresh produce has become

dependent on farms where wages and working conditions may be minimal (Lawrence, 2011; Leidel, 2012). Such food access is typical of that of England as a whole. The current abundant year-round availability of fresh produce in Portsmouth is due to importing overseas produce in preference to that once locally grown. As a result, self-sufficiency in vegetables has declined precipitately as shown in Figure 2. Of course, the pattern of varieties of vegetables consumed seasonally has also changed during the past few decades. For example, the buying public expect fresh bell peppers and tomatoes be readily available even during the winter months in England. Such produce can only be produced in either large-scale industrial greenhouses in Kent, for example, or imported from countries with warmer climates. Hallsworth and Wong (2012) have estimated that example tomatoes produced in heated Kent greenhouses would have substantially larger avoidable CO_2 emission than that grown in fields in Alméria (Spain), on a farm-to-fork Portsmouth basis.



Source: http://www.ukagriculture.com/farming_today/crops_self_sufficiency.cfm

Figure 2. Self-sufficiency in fresh vegetables in Britain.

8 Land availability

The ability of an urban-gardening approach to reliably supply a significant quantity of food is highly problematic, in view of its still-diminishing/already-limited land base and increasing population size during the past few centuries.

Due to past Enclosure (Inclosure) and Commons legislations, land available for private cultivation by the peasantry has been reduced substantially. The Enclosure Acts, a series of legislations enacted mainly between 1750 and 1860, permanently abrogated the historical rights of local people to use open fields and common land for the grazing of livestock etc. (see, for example, Merriman, 1996: 367-369). Moreover, the Commons Act of 1876 virtually eliminated the historic concept of "common land": individual land ownership/exploitation is the rule. It is however recognized that there are numerous instances in which urban agricultural commons, viz., allotments, have existed successfully until the late 18th century when English towns were still relatively small (see, for example, French, 2000; Flavell, 2003). As a welcome form of partial redress, "allotments" were first codified in the 19th century with the main points of legislation eventually laid out in the "Small Holdings and Allotments Act 1908" which remains the principal statute on allotments for England and Wales. By the early 20th century, there had been a growing demand for allotments by the poor. The 1908 Law placed on local government authorities a mandatory obligation to provide allotments and to organise the system of letting. At that time, any six registered parliamentary electors resident in the borough could present a request in writing whereupon the council would be obliged to consider the request to provide an allotment. Powers were also endowed to compulsorily acquire land for allotments. Interestingly, a tenant must not live more than one mile outside the area for which the allotments were provided. In the original 1908 Act, a "10-rod or 10-pole" plot size (≈250 m^2) was considered sufficient to feed a family of four persons for 12 months (NSALG, 2012). It may be noted that farming on such size of plot to "feed a family of four" was essentially a full time occupation. In view of the contemporary dietary pattern, it is doubtful that such a plot size could be adequate even if the 4-person family would undertake to "work the land full time".

Figure 3 illustrates the growth and decline of allotments in the UK since 1870. Note the two peaks were during the periods of World War I and World War II, in which the "Dig for Victory" campaign was most active. Local production of food was asserted as a national priority then. The allotments system still persists in most English localities. Today, allotment gardening remains almost certainly the only recreational activity which has its own legislation in England. The proposition of "The Poor growing food to feed themselves" has long ceased to be the driving force, with the population having become ever more dependent on food supply provided by giant supermarkets

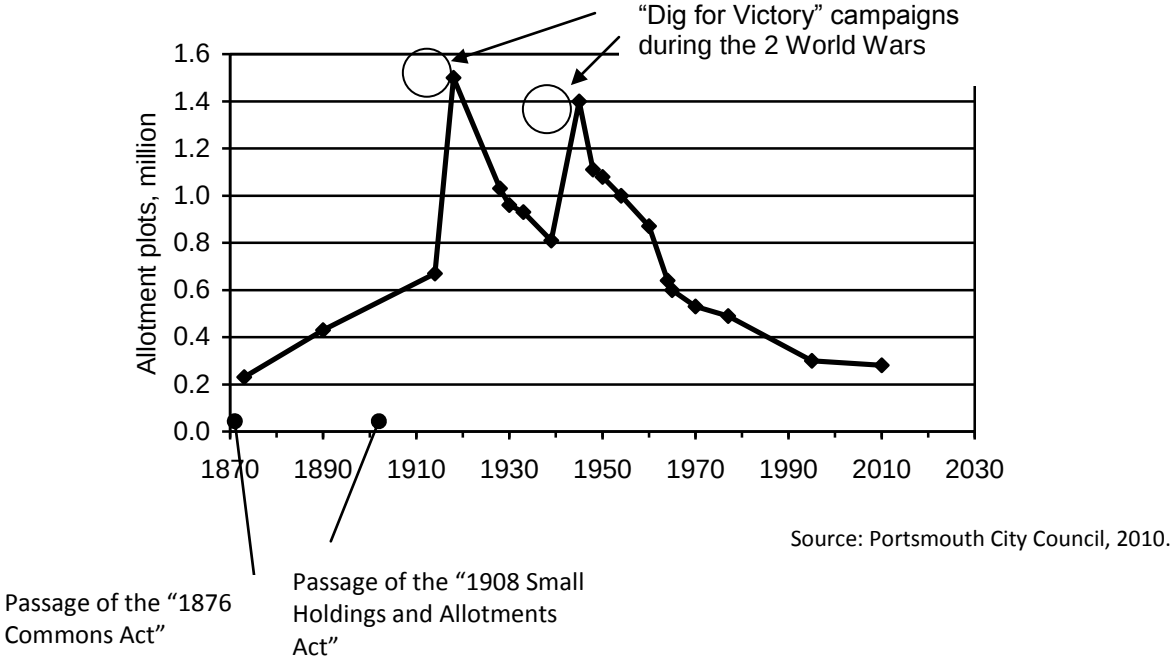


Figure 3. Allotment plots in the UK since 1873.

The nineteenth-century system of allotments remains popular in the Portsmouth area, despite its small island-bound land base. The location of the allotments in Portsmouth is given in Figure 4. In recent years, additional allotments have been lost – often to land intensification and not least to overbuilding by giant supermarkets as happened with Tesco at North Harbour, Portsmouth and ASDA (owned by Wal-Mart) in nearby Waterlooville. So, the 0.44-hectare North Harbour allotment is the residue of a larger site upon which Tesco built a large food store more than a decade previously. An examination of official sources suggests that there are few informal food growing activities in Portsmouth. In 2012, Portsmouth City Council managed 1,685 plots across the city, split between allotments of varying sizes at eight locations (Portsmouth City Council, 2012). The emphasis of Portsmouth allotments is personal enjoyment of growing vegetables, fruit, flowers or herbs for personal consumption. This reality was confirmed during site visits to allotments: a strong sense of community and common purpose was entirely evident. Efforts to obtain personal food self-sufficiency were not - though many looked forward to consuming seasonal produce home-grown for taste not appearance.

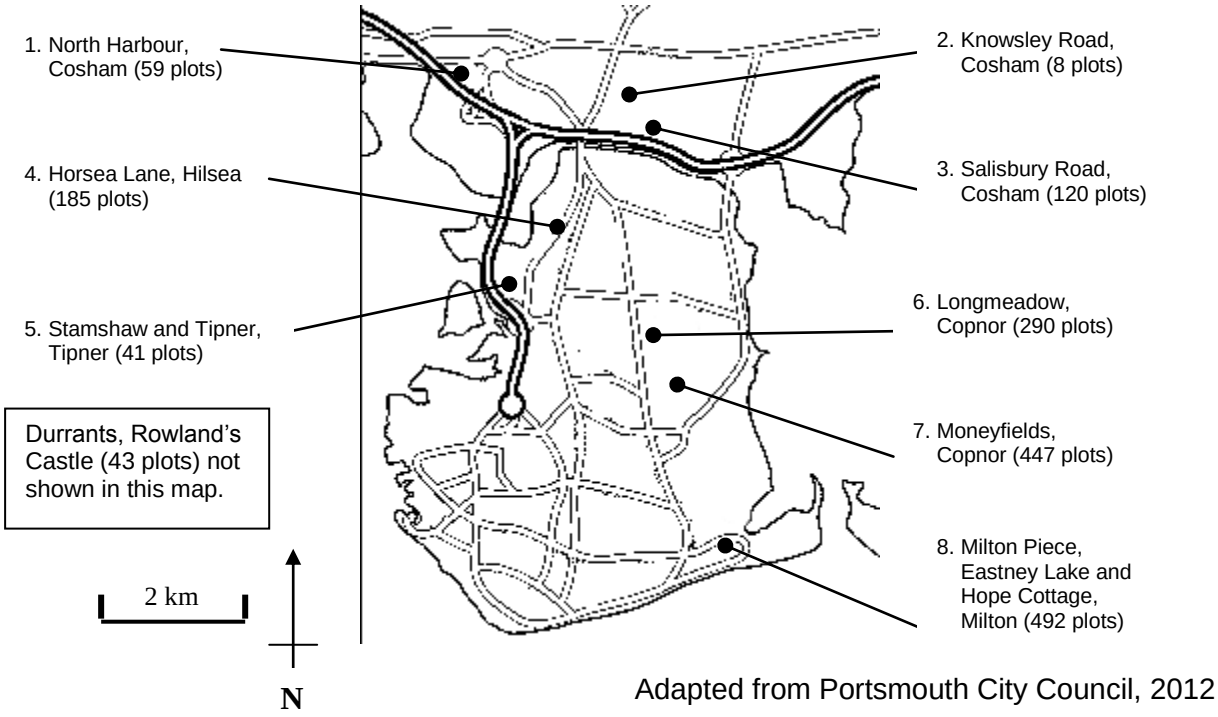


Figure 4. Portsmouth allotment gardens for food production

From mid-2009, plot sizes were changed and the standard plot reduced to 75 m^2 for any new lettings. Essentially, a large waiting list had built up at all the allotment sites. The typical waiting time in 2010 was 3 years (Portsmouth City Council, 2010). This new plot-size arrangement did not affect existing allotment holders. Over the years, numerous rules and regulations were imposed on the operation of allotments. For example, tenants may erect only one shed, one greenhouse, a compost bin and a cold frame on their plot. However, no additional structures (including poly-tunnels) may be erected without written permission of the Portsmouth City Council Parks Service which manages the scheme. If each plot area was assumed to be uniformly 75 m^2, the total allotment land would be 12.6 hectares, equivalent to about 0.3% of the land inside the Portsmouth city limit.

In Portsmouth, the urban gardening model is founded on small-scale urban gardeners working part-time on private or community-assigned lots. However, if food supply was to extend well beyond the own-use regime, commercial large-scale operations would be essential to maintain profitability. Note that official permission for such an extension of food supply from public allotments would be unlikely to be forthcoming. In reality, the lack of land within the city limit renders the scope of urban gardening to be at best a supplementary means of food provision. Note that the use of roof tops is being promoted as a means to overcome this land problem in Berlin and elsewhere (see, for example, Schmidt, 2011). The practical logistics of delivering adequate water, nutrients, heat and lighting to roof-top gardening sites remain very problematic even under the best of circumstances. Moreover, using scarce urban land to grow food for supplying fashionable high-street restaurants (Roberts 2012) does not solve the basic food supply problem for many needy citizens. No instances of roof-top gardening sites have yet been recorded in Portsmouth.

9 Societal changes

There are, however, notable systemic obstacles to the deployment of urban gardening for local food-production viz., substantial changes in employment patterns, increased urbanization and evolving family structures in English society that have arisen during the past 50 years. There is unfortunately no practicable path back to the modality of local and regional food supply.

10 Subsistence farming

In the days before the Industrial Revolution, English cities such as Portsmouth would typically be supplied with foods produced nearby – and not just in the agricultural countryside (Atkins, 2003). In medieval England, subsistence farming for self-sufficiency was, in effect, organic farming as synthetic fertilizers, pesticides or herbicides were not available. The average holding for the peasant farmer has been reported to be 12 to 15 acres (about 5 to 7 hectares), in which the land was rotated between grains, peas and beans, and fallow for the management of soil fertility (Sommerville, 2013). Separately, Scott (2011) has noted that the average farm land holding was about 20 acres. It has been estimated that at that time, one person required about 2 acres (≈0.8 hectare) of wheat for sustenance each year. It may be noted very little meat was consumed by peasant farmers in medieval times (Anon., 2013). Protein for human nutrition was supplied largely from grains and pulses.

The 1604 Scottish Border Survey (ELSG, 2013) noted that corn[2] yields were normally in the range of 12 to 16 bushels per acre (798 to 1,064 kg per hectare), of which about 25% would be retained for use as seed in the following year, and a typical peasant farm family consisted of 5 people and required an average of 24 to 30 bushels (651 to 814 kg) of corn[†] per year to maintain adequate level of nutrition. If this medieval "cropping and consumption of corn" scenario (i.e., maximum yield and minimal consumption) was transposed to present-day, the *total* land available (i.e., 4,025 hectares) within the Portsmouth city limit would only be able to offer subsistence-level support to about 26,000 persons. The population of Portsmouth was more than 200,000 in 2011. Production of food, even basic staples such as "corn", to feed the entire Portsmouth population is clearly not feasible.

Regardless of the exact means of local farming to be deployed, the supply of farm labourers remains problematic. In an open economy, the labour force is attracted naturally to better salaried off-farm employment. Only desperate new immigrants are prepared to toil for minimum wages in farms. This labour-shortage situation is prevalent even in Spain where the meteorological conditions for vegetable production are more favourable than England. Spain deploys a large supply of illegal and legal immigrant farm workers; minimum wage or less is paid routinely.

Table 2.
Fundamental features of traditional subsistence farming and modern-day urban community gardening for food security

	Traditional agrarian	Present-day urban
Agriculture	Small scale, low intensity subsistence farming	Urban (community) gardening for food security
Best climatic region for successful horticulture	Humid, tropical conditions in which temperatures and rainfall are usually high year round	Temperate zone with lower temperatures and longer cold season is unsuitable for subsistence farming
Energy cycle	Rapid decomposition of dead biomass to fertilizers, under natural humid warm conditions	Slow decomposition of dead plant materials to fertilizers through on-purpose composting
Practical population density, number per km^2	<6	Portsmouth at >5,000 is well outside the practical range
Labour intensity	High, usually on a full time basis	High, but generally practiced part-time or hobby basis
Food supply pattern	Planting and tending of domesticated food plants, supplementing with foraging, pastorialism, fishing and hunting; bartering as required	Cash economy; external non-farm salaried employment for enabling purchases of food grown under intensive agriculture conditions.
Practice	Now largely limited to tropical Americas, Africa and Melanesia (see, for example, Brown, 1978), in which "shifting agriculture" is being still practiced.	Limited city land available for the growing some vegetables, herbs and flowers for personal enjoyment

[†] In medieval England, "corn" generally means grain for human consumption (Mencken, 1921). Wheat was then the most commonly consumed cereal grain. Thus the calculation for illustration purposes herewithin is based on wheat, i.e., average 27.14 kg per Imperial bushel. The cereal grains of secondary importance were oats, barley and rye. Maize (i.e., corn, in the modern American usage) was introduced in England from the Americas only in the late 1770s.

It is generally recognized that a nostalgic return to subsistence farming is impossible in present-day highly urbanized societies. Table 2 compares some of the fundamentals of food supply of the traditional agrarian and present-day societies. There are several intractable obstacles in achieving this idealistic goal of local food supply for greater availability and affordability. It is interesting to note that in Ewyas Lacy (southwestern Herefordshire) in 1604, small farms (typically <3 hectares for a family of 5 people) grew a wide variety of cereal and root crops for year round use, and reared some farm animals for meat and diary products (Anon., 2007). Subsistence was effectively achieved with supplementation from game (e.g., hares, etc.) hunted during the year. Because there was no practicable means to import fresh produce from outside of England at that time, the variety of produce available for popular consumption was limited by seasonality.

11 Cultural expectations

Over the past 50 years, the concept of seasonality of foodstuffs has gradually eroded. This has gone hand-in hand with the rise of powerful food retailers with the capacity to source globally. Accordingly, urban citizens have become accustomed to finding a year- round supply of fresh produce such as tomatoes. This taken-for-granted supply of non-essential foodstuffs is not without its consequences. The off-season supply of tomatoes is provided in part from large greenhouse operations and industrial farms: often located many thousand of kilometres from the end consumer. Because of the cool northern-latitude climate, urban gardens could only provide a very limited amount of seasonal fresh produce, even if large tracts of land within the city limit were available. In the case of solanaceous fruit crops such as tomatoes and bell peppers, heated greenhouses with attendant high CO_2 emission serve to meet this acquired/induced demand for year round supply (Hallsworth and Wong, 2012).

Some local community groups have suggested growing local food for distribution by local shops. This strategy has some prospect of success in the rather more rural hinterland of Portsmouth where larger gardens are more common. Though rural allotments are under less threat of *bétonisation*[‡], sale of their produce for profit is frowned upon. To a very large extent, food distribution is now controlled by a few large corporate entities. In Portsmouth, over 80% of food distribution (including retail) is controlled by just 4 businesses: Tesco, ASDA, Sainsburys and Morrisons. As the volume of food required to supply large urban centres such as Portsmouth is large, dependency on these few distributors and retailers has increased year by year (King et al., 2010). Cembalo et al. (2011) have reported the spontaneous emergence of the "Solidarity Purchase Group" model in Italy in which individual citizens sign contracts with local farmers to purchase a certain type and amount of produce on a regular basis, as a means to circumvent the classical supply chain. Both contracting parties expect to benefit from such a purchasing arrangement. This model is virtually identical to the well-known cooperative food-store model in which members receive point-of-sale discounts or end of year profit dividends. Over time, cooperatives generally evolve to become virtually indistinguishable from other large food distributors-retailers operating on a standard profit-driven business model. It is interesting to note that farm-direct sales (in the USA) had remained essentially static at about 1% of all farm-gate sales in the decade between 1997 and 2007 (Lev and Gwin, 2010). Another contentious issue for weekend Farmers' market is the competition against food retailers who have to paid city taxes for their fixed locations.

12 Global context

It is recognized that global institutions such as the Food and Agriculture Organization of the United Nations are actively promoting urban and peri-urban agriculture as supplementary food sources (see, for example, FAO, 2012; FAO, 2014). It may be noted that these policies initiatives are generally directed to less developed countries in the semi-tropical and tropical climatic zones in which one or more crops could be grown almost continuously throughout the year. Additional critical factors affecting practical implementation include adequate availability of water and labour. Because the climatic, societal, cultural and economic structures of these targeted less developed countries are substantially different from those highly developed countries of North America and Western Europe, it is highly unlikely that the same policy outcome could be achieved at all in locations such as Portsmouth, England. In the illustrative example of tomato cropping in an urban agriculture context, Vancouver (Canada) encounters similar intractable structural problems, e.g., high urban land price, unfavourable climatic conditions, shortage of water during the growing season, and availability of low-cost labour (Wong and Hallsworth, 2014).

[‡] Used in contemporary French to mean "paving or concreting over"

Recently, Thebo et al. (2014) have pronounced the importance of urban and peri-urban agriculture in global food security. Their expansive conclusion was based largely on statistical observation that most of the global croplands are located within 20 km of urban centres. The pitfall of this interpretation in the context of global food security could be illustrated with the case of Winnipeg (population: ~664,000 in 2011; 664 km^2 land area) in Canada. This city is located in the eastern end of the Canadian Prairies in which more than 50 million tonnes of cereal grains (viz., wheat, barley, oats and rye) and oilseeds (viz., canola and flaxseed) are cropped annually. Indeed cropland extended immediately outside the city boundary for at least 100 km in all directions. The next largest town (Brandon) located 100 km west of Winnipeg is also surrounded by cereal grain/oilseed cropland for yet another 200 to 500 km until the next major town (Regina) further west. On this basis, one could conclude superficially that substantially cropland is located close to urban centres; such statistical interpretation could distort the global averaging of the proximity of cropland to urban centres. Moreover, very little of grains and oilseeds grown are processed locally for consumption by the urban residents of Winnipeg. Indeed most of the cereal grains and oilseeds are grown for the export trade. Most vital cropped foodstuffs are imported from distant production areas of North America and abroad. It is instructive to note that the total urban (city) area of the 9 major Canadian Prairie cities (viz., Edmonton, Calgary, Lethbridge, Medicine Hat, Prince Albert, Regina, Saskatoon, Brandon and Winnipeg) is 3,055 km^2 with an average radial distance of ~10 km from city centre; these aforementioned cities are surrounded by about 225,000 km^2 of grain-oilseed cropland (AAFC, 2014). And cropland starts immediately outside the city limit, in all cases. This example illustrates the significant limitation of this type of analysis, i.e., proximity of cropland to urban centres, to justify urban agriculture as a means to provide global food security. Additional issues of "urban" food security as related to prevailing economic inequality in contemporary western societies are discussed elsewhere (see, for example, Wong and Hallsworth, 2014).

13 Concluding remarks

Two fundamental questions remain: what can a civic government do to improve food security in an urban setting and does urban gardening in private and/or community lots, really improve the City's food system? The answer to both questions is: very little.

Civic government is essentially unable to develop alternative food supplies that offer greater affordability (syn. accessibility) for its citizens. It does not have the authority to tax the sale and consumption of foods, in a way that would bias consumption in favour of locally produced foods[§] and with the intent of improving the affordability of foods. Direct financial support such as food coupons for low-income citizens is effectively a funds transfer to mainstream food retailers. The fundamental issue of accessibility, however, has not been resolved. Policy intervention at higher levels of government is largely an indirect consequence of political support for the development of small- and medium size agricultural enterprises (Hardesty, 2010). In a free-market capitalistic economy, it is difficult for governments to intervene to alter the dominant market structure. Development zoning/planning is the only means available to influence the location of urban food production units or retail food outlets. Altering zoning/planning rules to facilitate the development of roof-top community gardens in city-owned buildings would be one example. Practical experience from other cities has shown that financial viability is difficult to achieve, not least because agriculture is typically associated with the lowest land values. For example, the roof-top approach requires food production to become a typical profit-driven agri-food business. The resulting product is typically priced well beyond the affordability limit of ordinary citizens.

Providing more community gardening opportunities is politically attractive, but this initiative does not enhance urban food production significantly. This is due to the short cropping season in the northern climatic zone and to the changing pattern of employment of individuals and family units. In effect, urban gardening can only afford personal enjoyment of having grown one's own vegetables and fruits. The educational element is of minor significance because there is essentially no practical possibility for a modern-day city to become self-sufficient in food supply. Learning more about food production does not alter the fundamentals of modern food supply. Indeed, civic policies are often contradictory. Food supply will remain precarious as the urban population expands under pro-development taxation-raising civic government policies. With increasing urban densification, the prospect of growing food within short distances to the centres of consumption has been diminishing rapidly. Overall, there may be a beneficial rise in personal well-being – physical and mental – for the allotment participant and this may be the greatest gain overall.

[§] EU regulations would, in any case, prohibit such a move

References

Agriculture and Agri-Food Canada – AAFC (2014). Canada: Outlook for principal field crops. November 21. http://www.agr.gc.ca/eng/industry-markets-and- trade/statistics-and-market-information/ (Accessed 14 December 2014).

Anon. (2007). The history of Ewyas Lacy: Farming in Michaelchurch Escley from Medieval to Victorian times. http://www.ewyaslacy.org.uk/ doc.php?d=rs_mic_0140 (Accessed 22 January 2013).

Anon. (2013). Food and drinks in medieval England. History Learning Site, http://www.historylearningsite.co.uk/ (accessed 25 January 2013).

Atkins, P. and Bowler, I. (2001). Food in Society: economy, culture, geography. London: Arnold.

Atkins, P.J. (2003). Is it Urban? The Relationship between Food Production and Urban Space in Britain, 1800-1950. In: M. Hietala and T. Vahtikari (eds.), The Landscape of Food, Helsinki: Finnish Literature Society.

Atmospheric Science Data Centre – ASDC (2013). Surface meteorology and solar energy: Portsmouth, UK (50.77°N, 1.08°W). Langley (VA): US National Aeronautics and Space Administration. http://eosweb.larc.nasa.gov (Accessed 01 November 2013).

Brown, P. (1978). Highland Peoples of New Guinea. Cambridge: The Cambridge University Press, pp. 30-38.

Cembalo, L., Migliore, G., and Schifani, G. (2011). Political consumerism and food community networks. Proc. 5th International Symposium on System Dynamics and Innovation in Food Network, Innsbruck, Austria, February 14-18.

Dxon, J., Omwega, A.M., Friel, S., Burns, C., Donati, K., and Carlisle, R. (2007). The health equity dimensions of urban food systems. *Journal of Urban Health*, **84**(1): i118-i129.

Ewyas Lacy Study Group – ELSG (2013). The History of Ewyas Lacy (southwest Herefordshire): Farming in Michaelchurch Escley from Medieval to Victorian times. htpp://www.ewyaslacy.org.uk/ (Accessed 22 January 2013).

Feagan, R. (2007). The place of food: Mapping out the 'local' in local food systems. *Progress in Human Geography*, **31**: 23-42.

Flavell, N. (2003). Urban allotment gardens in the eighteenth century: the case of Sheffield. *Agricultural History Review*, **51**(1): 95-106.

Food and Agriculture Organization – FAO (2012). Memorias - Seminario Internacional de Agricultura Urbana y Periurbana. Evento colateral en el IV Congreso de Agricultura Tropical, Convención Trópico, La Habana, Cuba, 14 al 17 de mayo.

Food and Agriculture Organization – FAO (2014). Urban and Peri-urban Agriculture. http://www.fao.org/ungao/bodies/coag/coag15/x0076e.htm (Accessed 08 December 2014).

French, H.R. (2000). Urban agriculture, commons and commoners in the seventeenth and eighteenth centuries: the case of Sudbury, Suffolk. Agricultural History Review, 48(2): 171-199.

Grunert, K. (2011). Sustainability in the food sector: A consumer behaviour perspective. *International Journal on Food System Dynamics*, **2**: 207-218.

Halliday, J. (2010). Local trend hitting home in last five years. http://nutraingredients.com/content/view/print/275888 (Accessed 02 February 2010).

Hallsworth, A.G. and Wong, A. (2012). Magnitude of CO2 emission in supply tomatoes to Portsmouth, England. *World Transport Policy & Practice*, **18**(3): 13-24.

Hand, M.S., Martinez, S. (2010). Just what does local mean? Choices, 25 (First Quarter). Milwaukee: Agricultural and Applied Economics Association.

Hardesty, S.D. (2010). Do government policies grow local food? Choices, 25 (First Quarter). Milwaukee: Agricultural and Applied Economics Association.

Jeswani, S. (2009). How far away is locally produced? SWEDEN.SE – the official gateway to Sweden. http://www.sweden.se/eng/Home/Lifestyle/Sustainability/ (Accessed 10 January 2013).

King, R.P., Gómez, M.I., and DiGiacomo, G. (2010). Can local food go mainstream? Choices, 25 (First Quarter). Milwaukee: Agricultural and Applied Economics Association.

Kneafsey, M., Dowler, E., Lambie-Mumford, H., Inman, A., and Collier, R. (2012). Consumers and food security: Uncertain or empowered? Journal of Rural Studies, doi:10.1016/j.rurstud.2012.05.005

Lawrence, F. (2011). Spain's salad growers are modern-day slaves, say charities. The Guardian - UK, February 7. http://www.guardian.co.uk/business/2011/feb/07/ (Accessed 20 July 2011).

Leidel, S. (2012). Life on the less than sunny side of Spain. Deutsche Welle – DE, February 9. http://www.dw.de/dw/article/0,,15728967,00.html (Accessed 09 February 2012).

Lev, L. and Gwin, L. (2010). Filling in the gaps: Eight things to recognize about farm-direct marketing. Choices, 25 (First Quarter). Milwaukee: Agricultural and Applied Economics Association.

Mencken, H.L. (1921). The American Language: An inquiry into the development of English in the United States. New York: Alfred A. Knopf. Part II. The Beginning of American, Chapter 4. Changed Meanings.

Merriman, J. (1996). A History of Modern Euorpe. Vol. 1. From the Renaissance to the Age of Napoleon. New York: W.W. Norton & Company.

National Society of Allotment & Leisure Gardeners Ltd. – NSALG (2012). Allotments – The Basics. http://www.nsalg.org.uk/uploads/article547/Allotments%20-%20The%20Basics.pdf (Accessed 12 December 2012).

Onken, K.A., Bernard, J.C. (2010). Catching the 'local' bug: A look at State agricultural marketing programs. Choices, 25 (First Quarter). Milwaukee: Agricultural and Applied Economics Association.

Pinstrup-Andersen, P. (2009). Food security: Definition and measurement. *Food Security*, **1**: 5-7.

Portsmouth City Council (2010). Allotment Open Day: Portsmouth's Allotments February 27. Cultural Services, Portsmouth City Council (UK). www.portsmouth.gov.uk

Portsmouth City Council (2012). Allotment Gardens. Cultural Services, Portsmouth City Council (UK). www.portsmouth.gov.uk

Roberts, G. (2012). Next stop, the Olympics: Urban farmers are digging for eco-victory.The Independent, January 8. http://www.independent.co.uk/environment/ (Accessed 08 January 2012).

Schmidt, F. (2011). Urban farming promise to slash food miles. Deutsche Welle- DE, November 14. http://www.dw-world.de/dw/article/0,,15525958,00.html (Accessed 14 November 2011).

Scott, R.A. (2011). Miracle Cures: Saints, Pilgrimage, and the Healing Powers of Belief. Berkeley: University of California Press, p. 5.

Sommerville, J.P. (2013). Medieval English society (to 1688). Unpublished notes. Madison: Department of History, University of Wisconsin. http://faculty.history.wisc.edu/ sommerville/123/123 13 Society.htm (Accessed 25 January 2013).

Thebo, A.L., Drechsel, P., and Lambin, E.F. (2014). Global assessment of urban and Peri-urban agriculture: irrigated and rainfed croplands. Environmental Research Letters, 9. doi:10.1088/1748-9326/9/11/114002.

UK Met Office (2013). Regional Climate: Southern England.

Wong, A., Hallsworth, A. (2014). Local food security initiatives: a case study of Vancouver, Canada. City: analysis of urban trends, culture, theory, policy, action, in progress.