Market Garden City and Greater London 2020

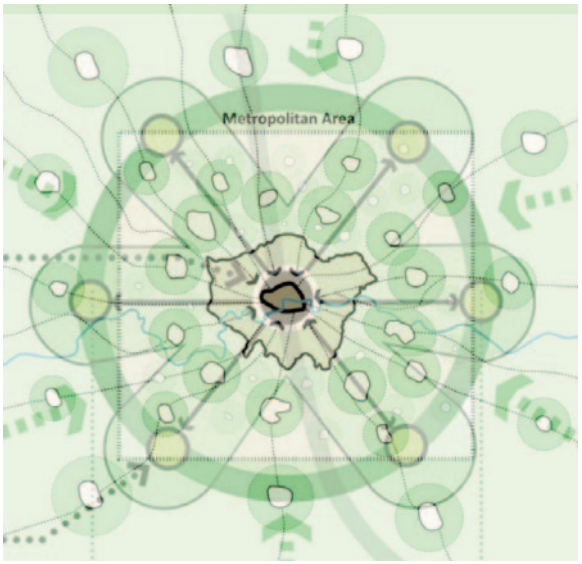
Gary Young develops his ideas for visionary planning and the Market Garden City referred to in the Forum report in earlier pages

There is an opportunity and the need for a radical shift in UK food policy, triggered by the global pandemic and the UK's paralysis in relationships with neighbouring EU countries. Professor Tim Lang in his book Feeding Britain explains that there is a clear problem and positive action should be taken in the UK rather than denial and a slide to autarky (extreme nationalism). The UK should rekindle its reputation as a forward-thinking creative nation and planning should take the lead with a holistic approach to health, wellbeing and the environment. Learning from these events central government should commit to a planning strategy seeking and supporting active involvement of local authorities, workers and citizens to ensure decisions are widely informed and deliverable for a future greener economy and lifestyle. Greater London 2020 (Planning in London April 2020) was produced to demonstrate how a plan benefits from the collaboration across a region including:

• Creating connectivity between London's regions with orbital Infrastructure for sustainable transport of trains and cycle hubs to enable growth in local economies. Orbital travel would increase options for people and businesses to reducie travel time and crowding during commuting and personal journeys.

• Reviewing the green belt to release space for growth whilst making more land available that is better suited for local food production and recreation than at present.

• Greener growth by densifying the city, extending accessible regional towns and cities and building new settlements all



required to achieve zero carbon and highest environmental standards.

Market Garden City was created as is a plan to demonstrate how local food production could be made possible. With a radical shift in policy, devolution and strategic infrastructure in place, as envisaged by Greater London 2020, the planning of food production from a regional base would be possible, encouraging and including bottom up community involvement and fair reward for both workers and providers.

The Market Garden City has many precedents, with localised food production, market gardens, enabling cities to prosper and survive for centuries before globalisation, yet this resilient local approach promoted by Ebenezer Howard's garden city vision in the early 20th century has been forgotten. This is not because a Market Garden City is impossible to achieve, rather because local food production by and for local people has not been valued enough as long term investment, or given any incentives to compete with alternative economies.

Success also requires better integration and collaboration between neighbouring regions who share economic, social, cultural and functional relationships to support stronger sustainable economies with better lifestyles and health outcomes.

• Rather than using a green belt as an arbitrary growth boundary a multi-functional green infrastructure network is needed that permeates the city, bringing localised food production within reach of populations which creates greater urban resilience.

• Creating green infrastructure as an investment to mitigate climate change, creating value over the long term for management of flood risk, water shortage, biodiversity loss and overheating.

• Dispersed infrastructure and transport investment along >>>

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Fig 1 Market Garden City 2014 Gary Young with Hannah Smart www.marketgardencity.com

BELOW:
Fig 2 Market Garden City 2014 Gary Young with Hannah Smart www.marketgardencity.com

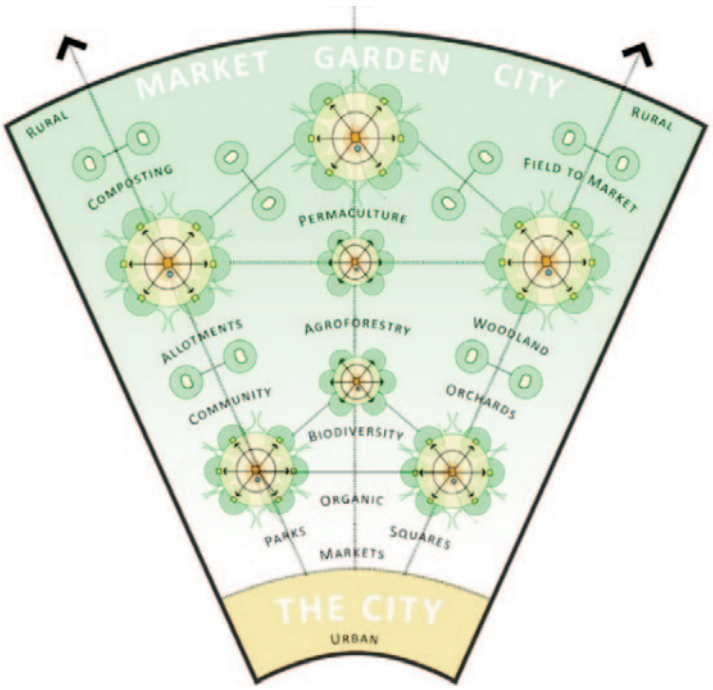

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Fig 3 Reproduced from Fig 2 of Gerbens-Leenes 'A method to determine land requirements relating to food consumption patterns,' Agriculture, Ecosystems and Environment 90(2002)47-58

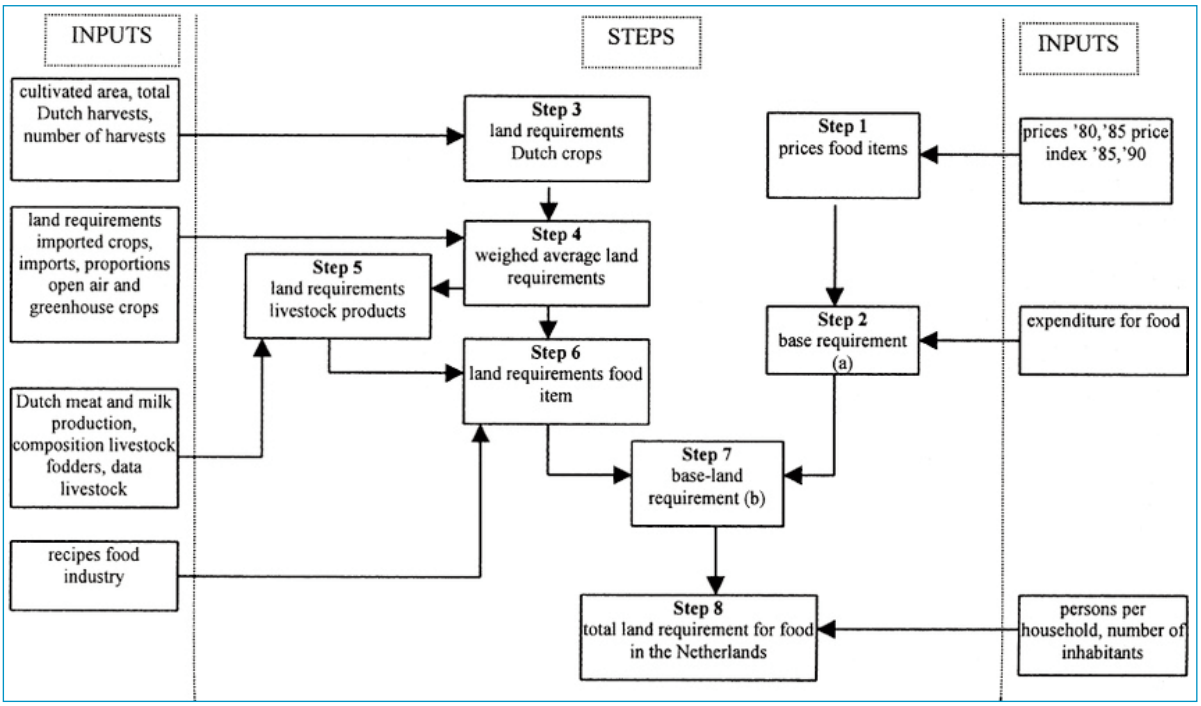

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Fig 4. Table 1 (left) and Table 2 (right) reproduced from Gerbens-Leenes et al. 'A method to determine land requirements relating to food consumption patterns,' Agriculture, Ecosystems and Environment 90(2002)47-58

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with local devolution of tax and funding and the ability to raise capital.

• Development and ownership of a coordinated strategic spatial plan is necessary alongside long-range economic and infrastructure plans.

• Capturing growth in design, arts, science and technology to create a future economy of knowledge-based employment opportunities and cultural facilities in the regions will make it possible to attract and retain talent.

London's heritage of urban infrastructure investment has shaped the city and its existing connectivity and place. This has served London well in the past, however new challenges require a programme of renewal. Greater London 2020 demonstrates better use of under-utilised orbital rail lines which can be made to work for London and the region, both enabling significantly increased housing around rail stations and bringing all settlements closer to self-sufficiency in food supply.

Professor Tim Lang demonstrates in his book Feeding Britain published in 2020 that there is capacity for the UK to provide self-sufficiency on UK land to feed its own population, but only with radical policy and dietary change. The current situation, demonstrated in DEFRA 2017 national data, is nowhere near to reaching any level of self-sufficiency. "We have made cattle and sheep our competitors in land use, consuming about a third of grain produced. Ecological and public health criteria must reshape land use, with more horticulture, less intensively farmed animal culture, less

Food item	Specific land requirement (m^2 year kg^{-1})	Household consumption (kg per year)
Beverages		
Beer	0.5	77.3
Wine	1.5	29.3
Coffee	15.8	8.9
Tea	35.2	1.8
Fats		
Fats for frying	21.5	8.0
Margarine	21.5	20.6
Low fat spread	10.3	9.8
Meat		
Beef	20.9	8.4
Pork	8.9	15.1
Minced meat	16.0	16.0
Sausages	12.1	14.9
Milk products and eggs		
Whole milk	1.2	34.6
Semi-skimmed milk	0.9	116.1
Cheese	10.2	27.6
Eggs	3.5	13.4
Cereals, sugar, potatoes, vegetables and fruits		
Flour	1.6	9.4
Sugar	1.2	22.3
Potatoes	0.2	153.6
Vegetables (average)	0.3	162.0
Fruits (average)	0.5	154.0

[a] Source: Gerbens-Leenes (1999).

Consumption category	Land requirement (m^2 per household)[a]	Land requirement (% of the total agricultural area) for household food consumption)
Meat	1022	29
Oils and fats	827	24
Milk products and eggs	598	17
Beverages	368	11
Bread	183	5
Potatoes, vegetables and fruits	168	5
Cakes and pastries	107	3
Flour products	68	2
Other food products	148	4
Total	3490	100

[a] In 1990 an average Dutch household consisted of 2.41 persons (CBS, 1993).

grain production. This would allow diverse re-wooding and uplands regenerated and re-wilded. Rural populations need to be directly engaged in the big changes, the result of multi criteria thinking". He states "If soil is the basis of civilization and the most complex systems on earth, Britain has been undermining its civilization with one third of soils degraded".

Feeding Britain by Tim Lang, *Our Food Problems and How to Fix Them 2020,* DEFRA 2017 has a breakdown of land registered as utilized agricultural area:

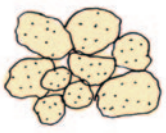
- 17 million acres of land registered 'utilized agricultural area'.
- 10 million acres grassland for animal production.
- 6 million acres croppable land.
- 1 million acres woodland.

4,745,000 acres actually cropped is divided into the following uses:

- 3,181,000 acres cereals. (67%) Up to 1/3 of which is for animal food.
- 590,000 acres oilseed. (12.5%)
- 145,000 acres potatoes. (3%)
- 661,000 acres other beet, peas. (14%)
- 168,000 acres horticulture. (3.5%)

With cropped land used for fruit and vegetable at 20% including horticulture at 3-4% there is clearly an imbalance and a need for a massive increase in fruit and vegetable production to achieve self-sufficiency and meet health requirements. This will also be necessary to provide resilience through less dependence on imports. Tim Lang explains how over time the UK has been led by geopolitical reasons to an import dependent food strategy. From a resources and emissions point of view it is essential to swing the supply to local sources and focus demand away from meat consumption, which consumes resources between four to ten times what a plant based diet would use. There is a need to use both carrot and stick incentives to create a supply of good quality low cost plant based food and support this with necessary legislation.

Firstly there is a need to collect and collate better data locally as well as nationally for the existing land used in the UK today. In addition to land areas, data is needed on yields, soils and nutrition values of different foods. Land use for production of crops suitable for direct food consumption needs to be evaluated against livestock grazing and crop for animals as indirect food source or products such as biofuels and food for export. Crucial information needed includes the amount of land wasted as grazing with low return and artificially created as moorland for game which could be made productive for direct food growing or biodiversity. With this data an urgent and complete audit is required to test the potential feasibility to deliver a plan for the UK to become self-sufficient on UK land to feed its own population. A plan is needed to grow more food for direct home consumption with shorter supply lines, to set goals to increase food production more appropriately and only on sustainable lines and provide a clear legally



Minimum = 365m² per person
(equal to 1m² per day of each year). This would consist of a diet providing maximum food energy from potatoes with little variation.

Standard = 730m² per person
(equal to 2m² per day of each year). This would consist of a diet on mainly potatoes with some vegetable and fruit variation.

Variety = 1095m² per person
(equal to 3m² per day of each year). With a diet consisting of potatoes with some vegetables, fruit, dairy and eggs.

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Fig 5. Market Garden City 2014 Gary Young with Hannah Smart www.marketgardencity.com

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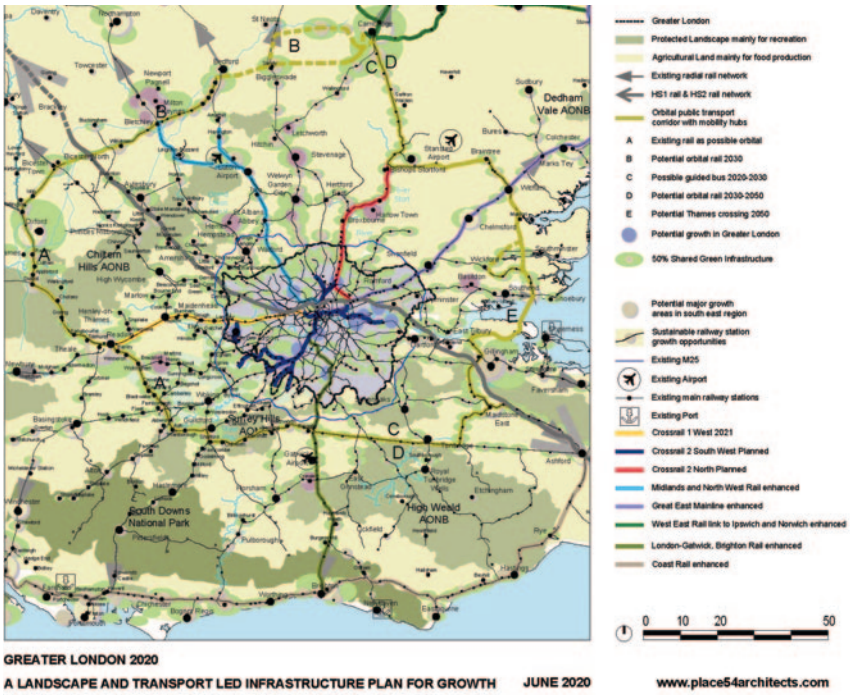

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Fig 6 Greater London 2020 - Gary Young with Place 54 Architects

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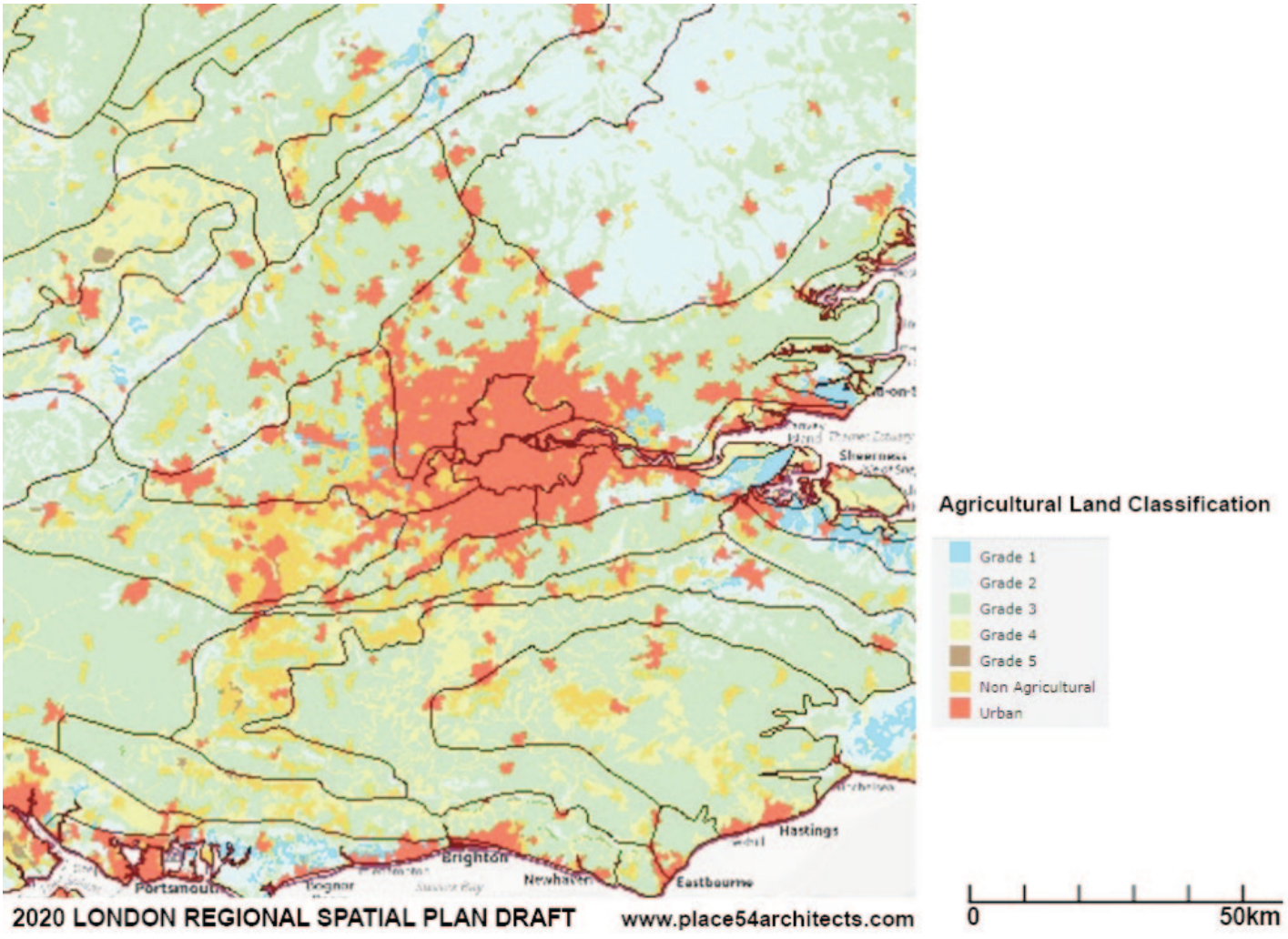
crucial aspect of this interdependency is collaboration and understanding from both city and regions of the need to allow regions to also be self-sufficient. This requires a collaboration between central and decentralised administration with powers to implement infrastructure, to gain trust and support of citizens to become engaged in self-sufficiency and the ability to decide, provide and deliver resilience.

BELOW:
Fig 7 Based on DEFRA Agricultural land quality for Greater London 2020

binding framework with targets.

The amount of land required to feed a city requires dependency on the region for available land, sufficient people occupied in food growing and a network of connectivity for distribution. A

The Market Garden City concept is a spatial planning tool aiming to demonstrate and encourage a shift to local food growing, demonstrating the land area required for self-sufficiency, imagining how a community food share could work to provide



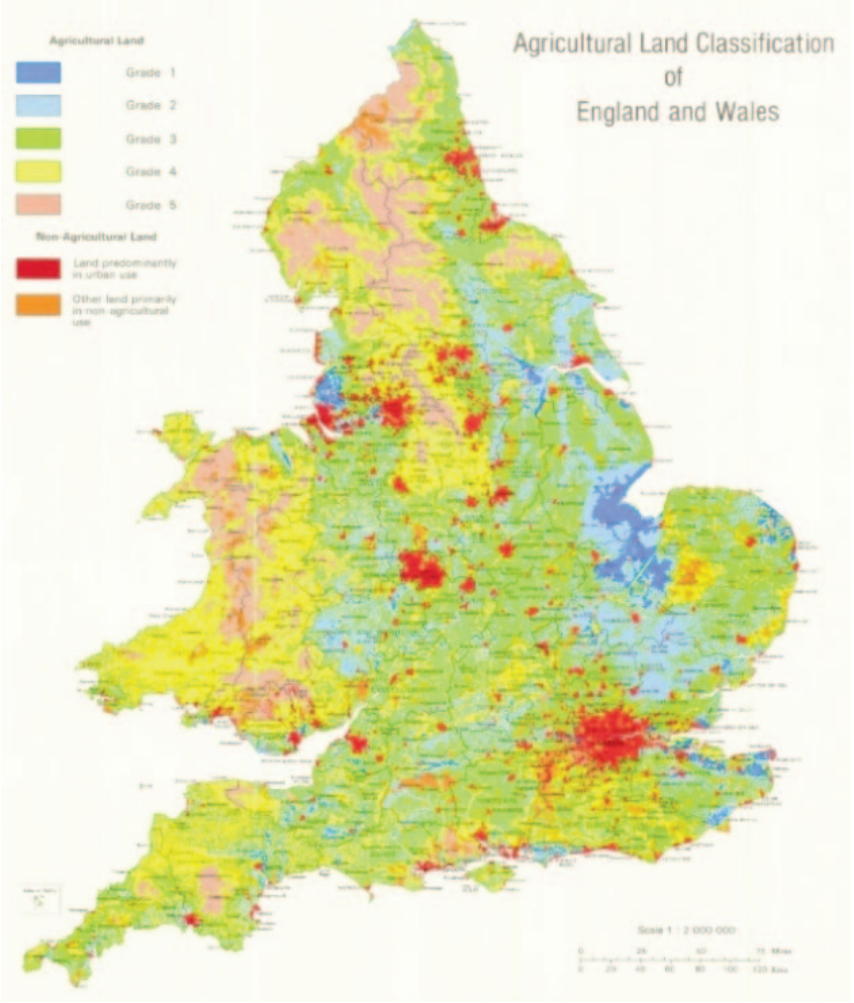
food locally scaling up from the individual, advocating an urgent radical new approach to regional land use planning ensuring sufficient land of suitable quality is available regionally and local networks are created to achieve this goal.

The diagrams from Market Garden City illustrates the interdependency of urban and rural communities. This link between town and country was a key part of Ebenezer Howard's plan for the Garden City which stated that 5/6ths (over 80%) of land surrounding garden cities should be dedicated to food growing and other local needs. The diagram created for Market Garden City is based on Ebenezer Howard's and advocates a better understanding of the role of green infrastructure as opposed to a green belt in creating the plans of Greater London 2020.

The Market Garden City concept starts with the daily amount of calories required by a typically active person and then gives this a spatial dimension established from available data to estimate the area of land needed to grow a range of foods for sustenance. The data in fig 4. is taken from a research paper by P. W. Gerbens-Leenes et al. 'A method to determine land requirements relating to food consumption patterns,' Agriculture, Ecosystems and Environment 90 (2002) 47-58. The paper examined land use required for food yields and average household food consumption. The yields and land required for each food in Fig 4. was reproduced from Gerbens-Leenes Table 1. This uses source data from Statistics Netherlands (CBS) based on a thorough step by step process illustrated in fig 3. reproduced from Gerbens-Leenes fig 2 where the output of one step produced the input of the next.

The Gerbens-Leenes research included a survey of Dutch households which is illustrated in Fig 4 reproduced in their table 2 average diet which included meat, fat and dairy, requiring an average 3490m2 land per year for one household of 2.4 persons. Table 1 has the area of land required for each food type demonstrating that vegetables and fruit have lower land requirement per kg and meat is the highest at 10 times vegetables. Table 2 demonstrates that the land required for meat and dairy is nearly 50%.of a typical household land requirement. Whilst meat and dairy per kg is more effective conversion into calories there is a disproportionate amount of land required and unsustainable environmental cost to be weighed against this. A study is urgently needed using a similar method to assess land required in the UK and including the environmental impacts in assessing diets with meat and without meat with alternative protein and vitamin sources.

The Market Garden City concept is intended as a demonstration which assumes meat consumption will be phased out of the majority of diets in order to reduce unsustainable resource depletion and carbon emissions and to restore biodiversity. The assumptions are based on the research of the Dutch household but modified to remove the land requirement for meat and fat and increase vegetables eggs or dairy, leading to an approximation of 2400m2 per year per household equivalent to 1000m2 per person. To make this easier to visualise it can be expressed as in fig 5 between 2m2 to 3m2 of land required for food per person per day. Whilst it is possible to reduce land required further to between 1m2 and 2m2 per person per day for subsistence food (for example mainly potatoes), this diet would be insufficient for long term health and well-being nor provide sufficient choice and therefore unlikely to be widely accepted.



ABOVE:
Fig 8 Based on DEFRA maps Agricultural land quality-England & Wales

The Greater London 2020 plan illustrated in Fig 6. has land area of 25,000 km2 within an approximate 50 mile distance from Central London and an approximate total population of 16 to 18million. The land area required for food self-sufficiency for this population in the Market Garden City concept would be approximately 16,000 to 18,000km2. This would be approximately 65-75% of the total area illustrated in the plan which is within the range of proportion of land for farmland in the UK. Fig 7. illustrates agricultural land quality for Greater London 2020 which has a significant amount of grade 3 (green) and some grade 2 (blue). With this land quality there is potential for food self-sufficiency in the plan, however there are still many land use and other factors to take into account such as recreation, national parks and uplands, which along with water resource, soil quality and crop yield will influence the potential. The scope of the plan could be made wider, it is sufficient to say at this stage that a fuller a study needs to be continued with the support of further research.

Data and research is needed to verify whether there is sufficient land for resilience across the UK, with yields and suitability of soils for all types of food produce. The plan area of Greater

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>>> London 2020 includes some of the best quality agricultural land in East Anglia some which claims from DEFRA data is under-utilised for direct food production. The most urgent requirement, pointed out by Professor Tim Lang is for research and publication of the data on land utilisation and diet for the UK of the quality of the Dutch CBS in order to enable a strategy to be developed.

This essay has concentrated on the link between Market Garden City and the plan area for Greater London 2020. Clearly food self-sufficiency requires consideration of the entire UK. The agricultural land quality map of Fig 8. England demonstrates good quality agricultural land (green and blue) is predominantly in the east with some dispersed areas, Fylde in Lancashire, borders of Wales, Somerset, Devon and Cornwall in the west. The west has larger areas of upland with lower soil quality (brown and yellow). Urban areas in red are a small percent of land use. A balanced strategy of food self-sufficiency will therefore be required taking into account national, regional and local considerations. This will involve rural and urban communities coming together with a true town and country strategy as envisaged by Ebenezer Howard.

Market Garden City is a concept demonstrating how a community could work together for a fundamental goal, essential to health and life, to provide food self-sufficiency and security. The concept aims to be scalable where an individual, starting by providing a small percentage of their own food, could with a local self-sufficient community, create collective food security. In parallel the collaboration engendered by the concept would be capable of empowering local people to achieve wider goals of carbon emission reduction, energy & water supply security, protection of the natural environment and biodiversity gain, gaining employment skills and training, education and caring.

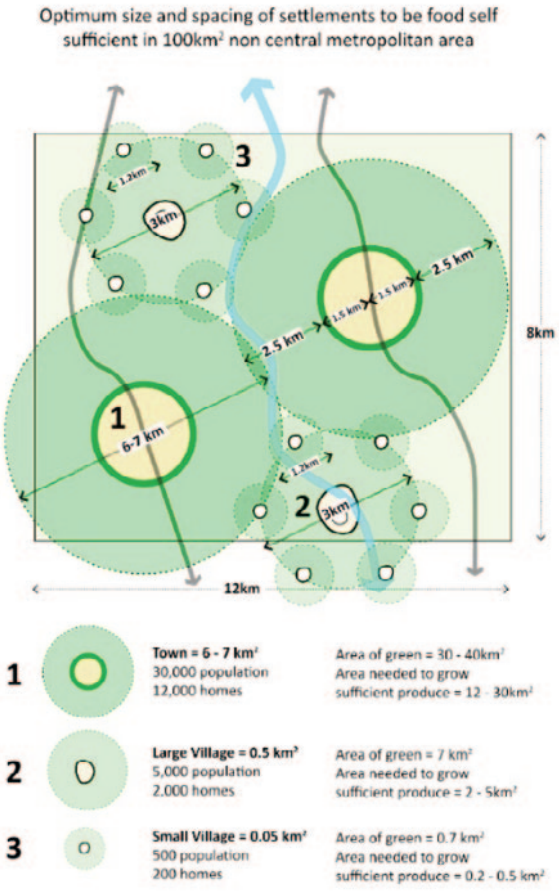

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Fig. 9 Market Garden City 2014 Gary Young with Hannah Smart www.market-gardencity.com

The Market Garden City concept aims to promote local horticulture for self-sufficiency. This is both an aspirational goal aiming to attract believers in veganism as well as new converts seeking educational and practical skills. The concept emphasises the scaling up from an individual to a whole community in a holistic way, integrating new ideas with existing skills in horticulture and best practice in organic livestock farming.

The town and country concept illustrated in fig 9. would integrate rural areas and urban areas. Green spaces for food production would permeate into the city creating a diverse mix of semi-public and functional spaces. Distribution in urban areas will be through a local hub which could be based on the traditional market hall, a covered and daylit extension of the surrounding streets

in fig 10, using modern methods of construction or existing building adaptable to locations. The hub will provide collection, distribution, organised volunteering and food share linked by mobility hubs using electric vehicles and cycles. A new form of place "The Green Ecumenopolis", literally a city without boundaries, could be created with productive landscape used for local food integral to the living place. The Market Garden City becomes a focus for local initiatives, sourcing and sharing staple foods and specialties, creating public realm, supporting locally diverse cultures, lifestyles, health and wellbeing.

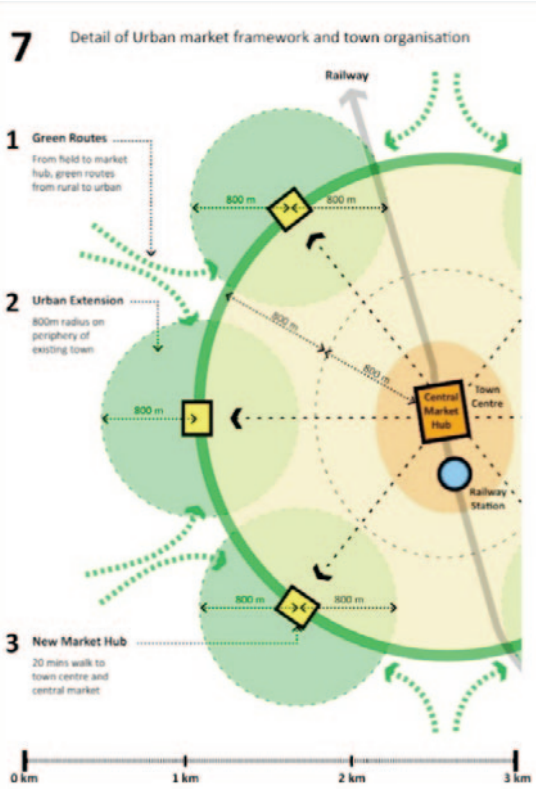

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Fig. 10 Market Garden City 2014 Gary Young with Hannah Smart www.market-gardencity.com

Gary Young is a founding director of Place 54 Architects. He has collaborated on master plans with Sir Terry Farrell for many years