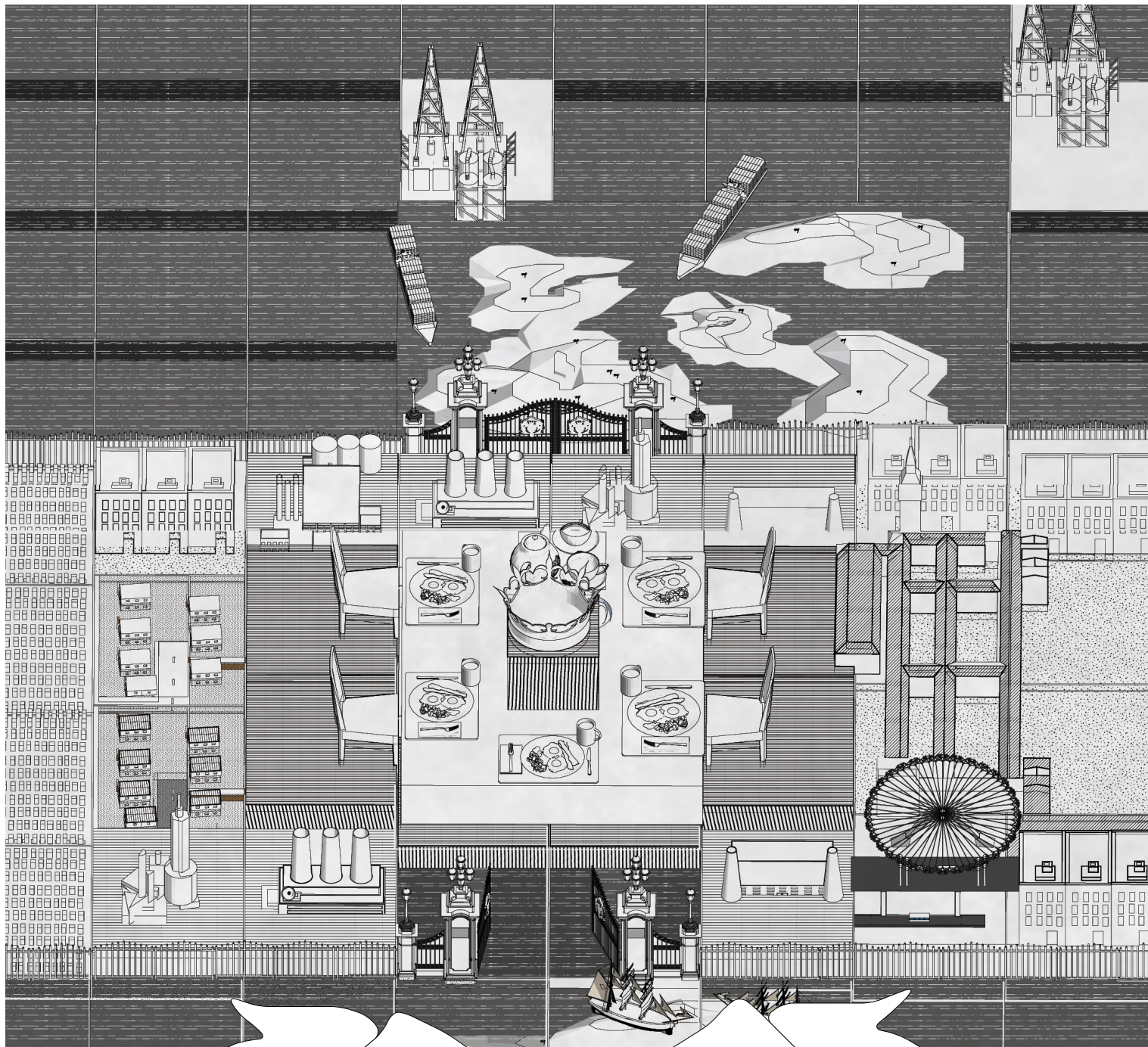




Food from the empire

Niroopa

Master thesis report , Delta interventions 2017-2018

Mentors : Dr.ir. Hamed Khosravi and Ir. Filippo laFleur

Niroopa
Student number : 4619269
niroopa92@gmail.com

Supervisors :

First mentor :
Dr.ir. Hamed Khosravi

Second mentor :
Ir. Filippo laFleur

Food from the empire

P5 Report

Delft University of Technology
(TUD) Faculty of Architecture and
the Built Environment
Department Urbanism
2628 BL Delft
Postbus 5
2600 AA Delft
The Netherlands

Research Studio

Delta Interventions
North Sea : Landscapes of Coexistence

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Christmas in India ,1881, drawing by E.K. Jhonson

*An idealized picture of British home life : attentive servants
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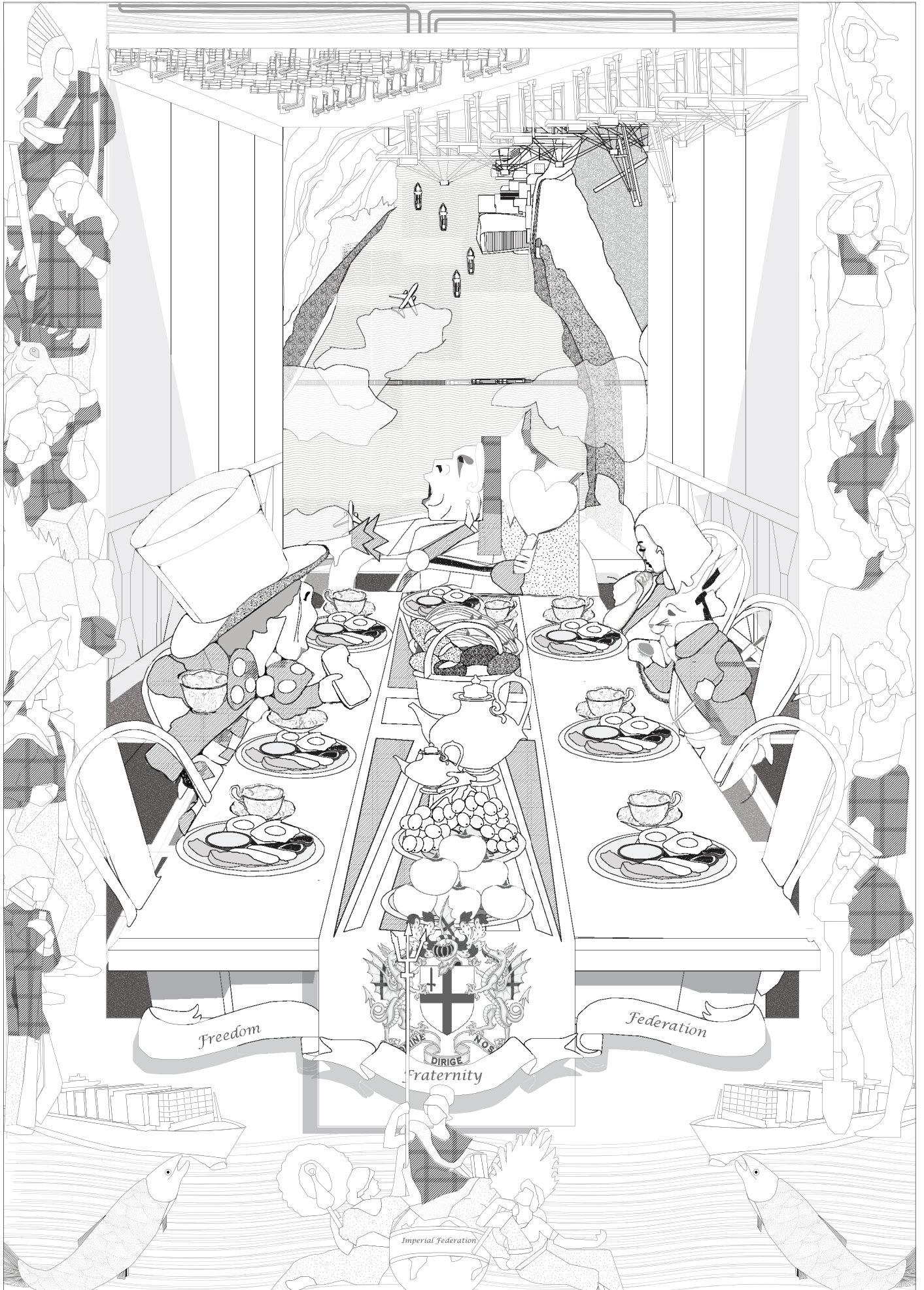


Great famine of 1876-78 India

Starving Indians beg for food at a British Army Post ,1878

Source : Getty images





The British Global company pvt. ltd.

Source : drawn by author

Prologue

The Hatter : *What is English but not English?*

Alice : *I haven't the slightest idea!*

The Hatter : *Why the English tea , of course!.*

The English breakfast tea is one of the most popular blended teas in British tea culture, an indispensable ingredient of their daily lives. Ironically though, this well-known cultural symbol finds its origins in a blend of teas coming from Assam (India), Ceylon (present Sri Lanka) and Kenya (Africa), making it one of the most prevalent derivatives of British imperialism.

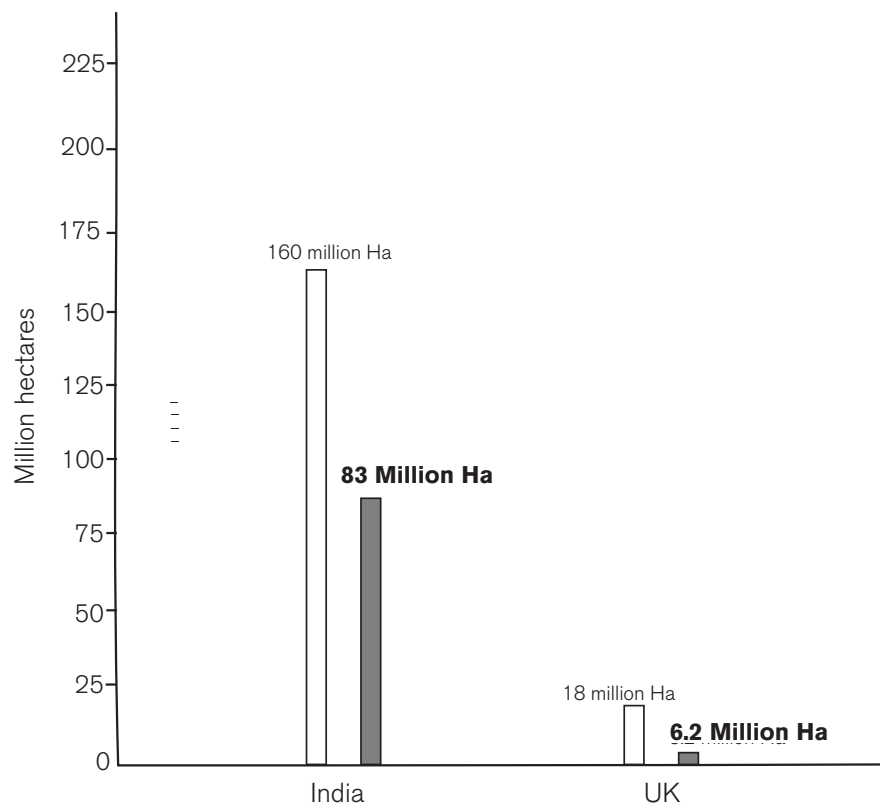
Much like Carroll's Mad Tea party, that is 'never ending for the guests as the time is perpetually stuck at 6 o'clock in the evening – tea time in wonderland', The British East India Company was in business for 282 years. At its colonial peak with the North Sea as Britain's new passage to the world, the Imperial Empire had occupied 24% of the Earth's land area with 23% of the world's population. During this time raw materials and other resources were expeditiously harvested from the land through the labour of indigenous people and valuable components were then shipped to Europe for processing and consumption.

Presently, in the age of economic colonisation one can observe similar trends. In 2015 amongst the total UK imports from Non-EU countries, 123 million kilograms were of tea alone! The UK imports almost 6 million tons of fresh produce annually, of which around 3.5 million tonnes are fresh fruits and almost 2 million tonnes fresh vegetables. One in three imported fruits comes from South America - particularly Costa Rica, Colombia and Dominican Republic, while Asian and African countries contribute almost 25% of the fresh imports.

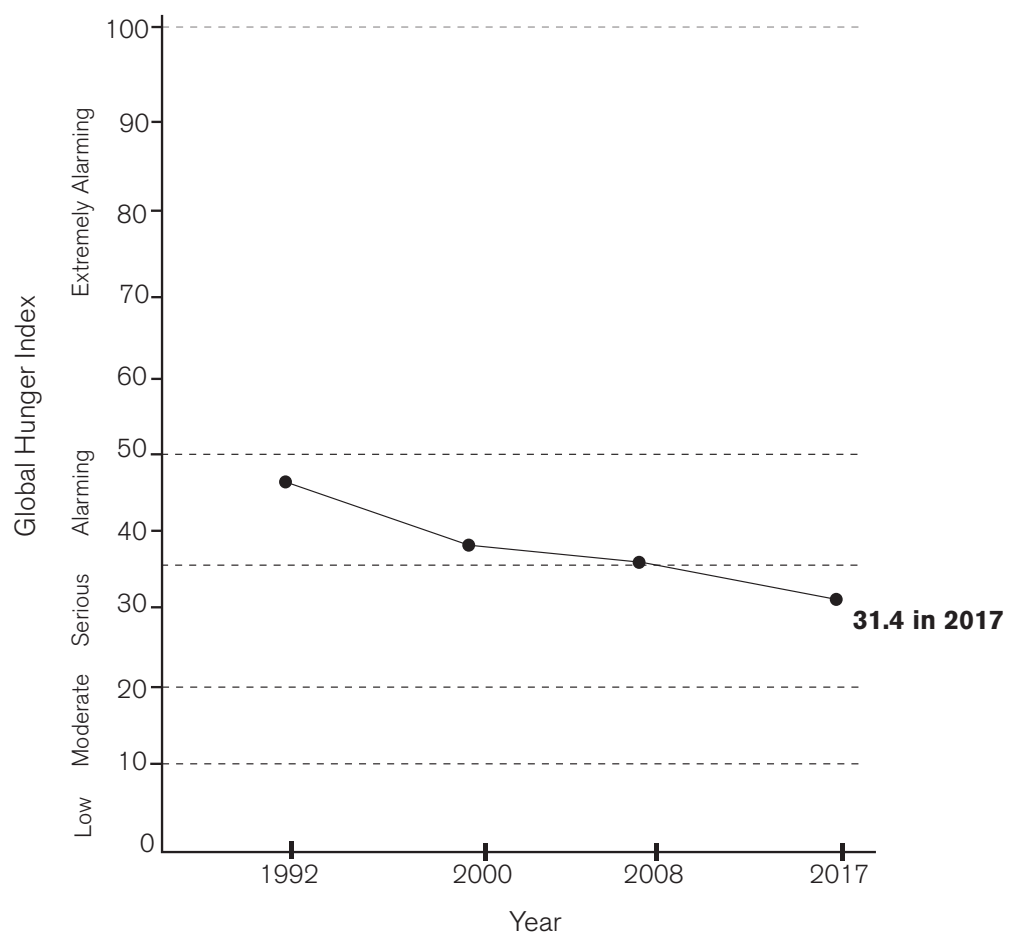
Today, more than half of UK's food and feed along with two-thirds of the total land needed for its production is based abroad. Yet its average consumption is so high that it is placed 20th amongst the top global food consumers, several places above its biggest importers. This increasing reliance on external resources is not only displacing the environmental impacts of its food supply overseas but is also entrenching a deep rift in the global production and distribution practices particularly in countries that face severe food and resource shortages.

The UK's need for global trade autonomy as it departs from the EU, will paint an even grimmer picture for a sustainable global future as it puts more pressure on its African, Asian and South American markets to gratify its food demands. If this new market does not reject the idea of economic progress of one at the cost of others we may as well be looking at a modern ingemination of its colonial past.

TOTAL ARABLE AREA VS CROPPABLE AREA

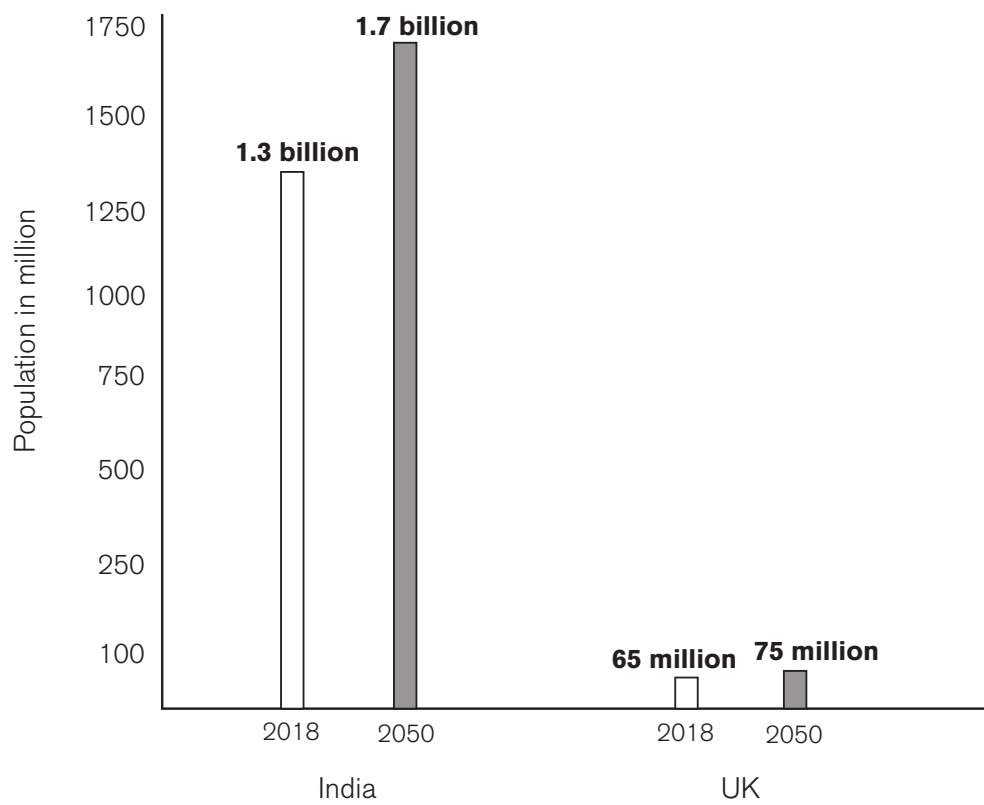


HUNGER INDEX INDIA



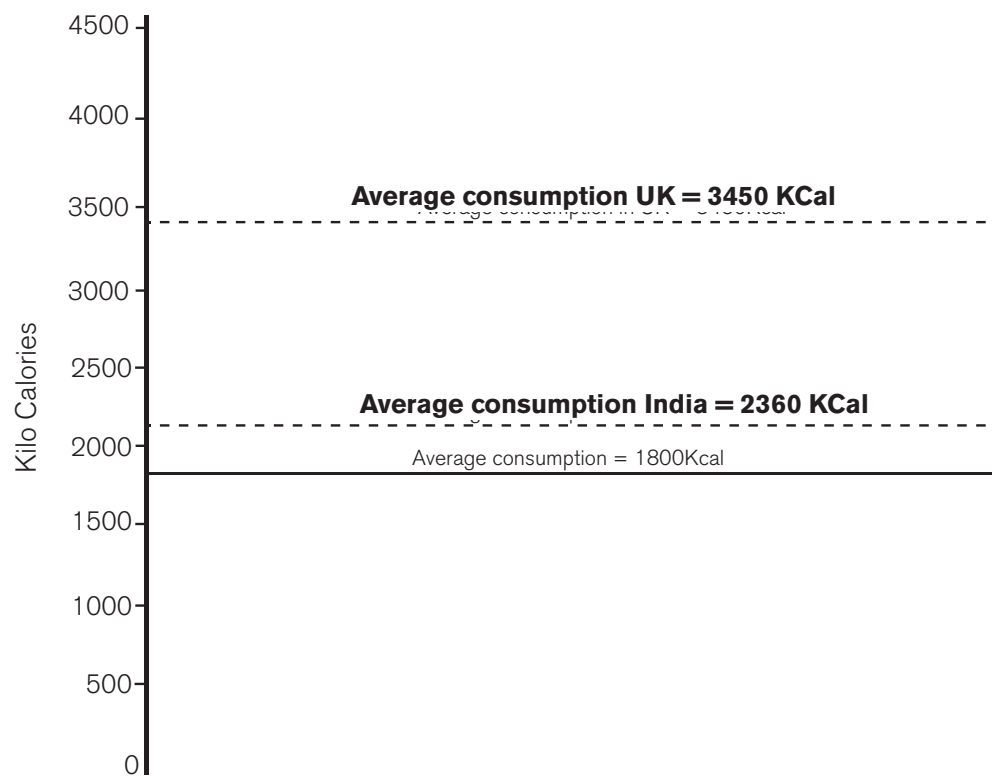
UK and India

CURRENT AND PROJECTED POPULATION



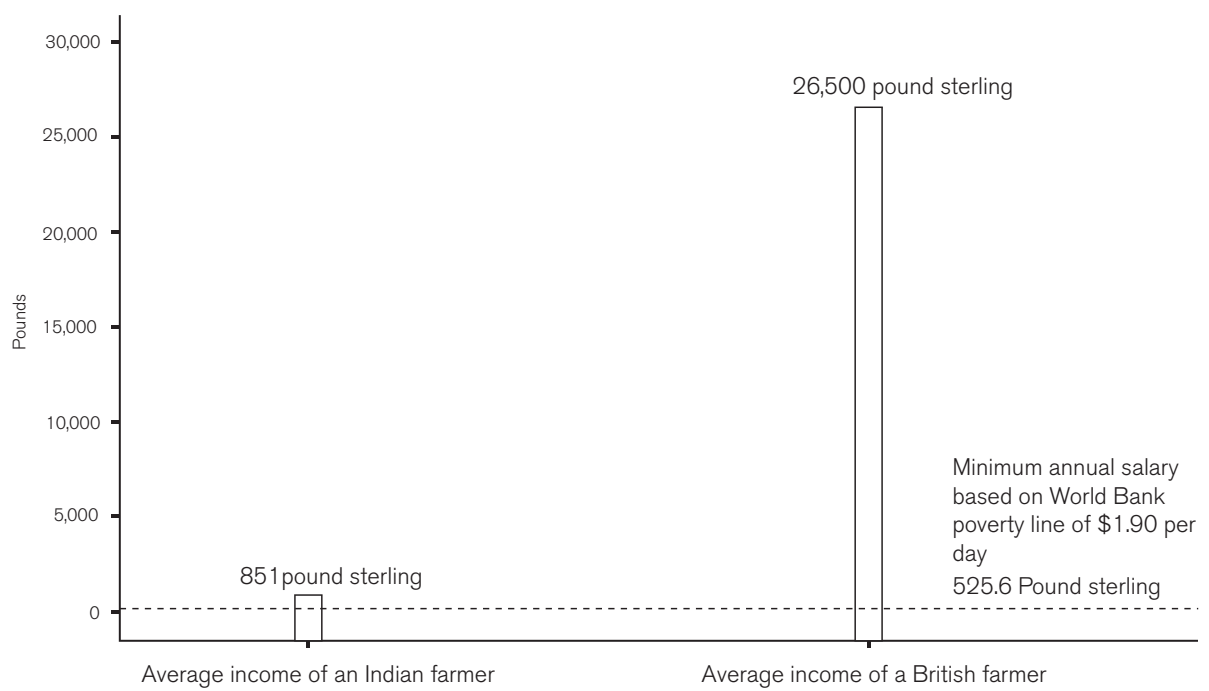
UK and India

AVERAGE CALORIE CONSUMPTION

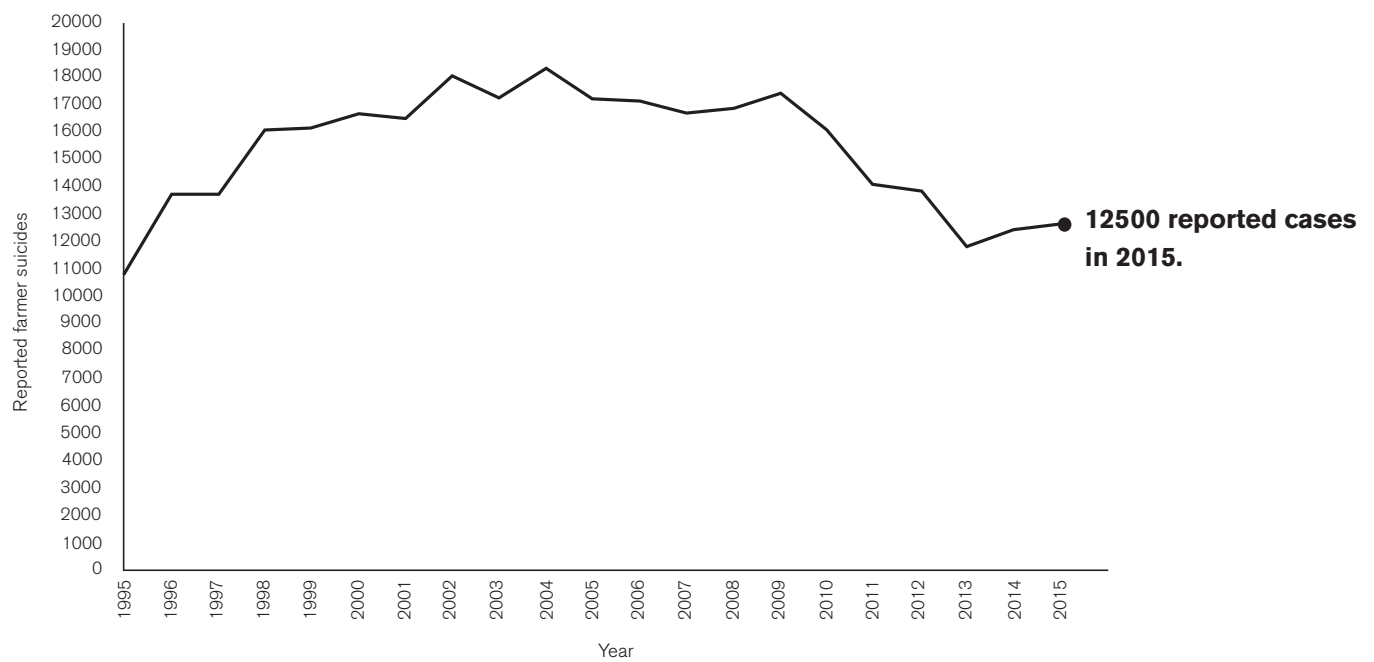


UK and India

AVERAGE ANNUAL INCOME OF THE FARMER



ANNUAL FARMER SUICIDES IN INDIA



I



[*The Hungry Empire**]



[The territory of the]



the British Empire]

I / 01.

The empire and the sea : *flows of power*

'UK's flourishing maritime food and commodity trade during this time laid the foundations for the development of some of UK's biggest cities today'

[Over several centuries the North sea has played a pivotal role in shaping the modern world and its civilisation. Since the 'discovery' of the new world in 1492, its vast expanse has embodied and encouraged new forms of art, science, religion, architecture and other significant institutions. This was crucial in establishing a new socio-economic and political world order which provided the structural geopolitical space for Northwestern Europe to develop in a capitalist direction. This became the very foundation for Britain's subsequent global ascendancy in the industrial era (Anievas & Nisancioglu, 2017).

With the North Sea as Britain's new passage to the world the British thalassocracy created one of the biggest colonial empires that lasted over three centuries. At its colonial peak, the imperial empire had occupied 24% of the Earth's land area with 23% of the world's population (Maddison, 2001). Trade and exploitation of resources in the new colonies became the understructure of this empire.

As Britain moved to an industrial economy that focused mainly on manufacturing, the agrarian economies of its colonies suffered. Raw materials and other resources were expeditiously harvested from their land through the labour of indigenous people and valuable components were then shipped to Europe for processing and consumption taking away any profits that rightfully belonged to them. The tropical weather conditions and the nature of the land and soil in these colonies created the foundations for a global-industrial economy that flourished by trading a range of raw materials (see figure 01) from - textiles : cotton, jute and silk (India), essential commodities : sugar, spices, rice, oil, tea and coffee (Africa, India and Ceylon) and precious stones : gold and diamonds (Africa). In fact, the demand for 'exotic' tropical products like - sugar, whole spices and condiments were such that they became the very foundation for the practice of slavery and indentured labour in the new world.

The food trade linked the colonies and the metropolis via complex bilateral and multilateral shipping routes of the North Sea. Overseas commerce during this time was conducted within the mercantilist framework of the 'Navigation act' which specified that all commodity trade - (food, textile, precious stones, slaves) take place in British ships, manned by British seamen trading between British ports and those within the empire (Morgan, 2011). Naturally such a doctrine was directed towards the prosperity and growth of ports in the UK. It could be said that the UK's flourishing maritime food and commodity trade during this time laid the foundations for the development of some of UK's biggest cities today - London, Bristol, Manchester, Liverpool etc.

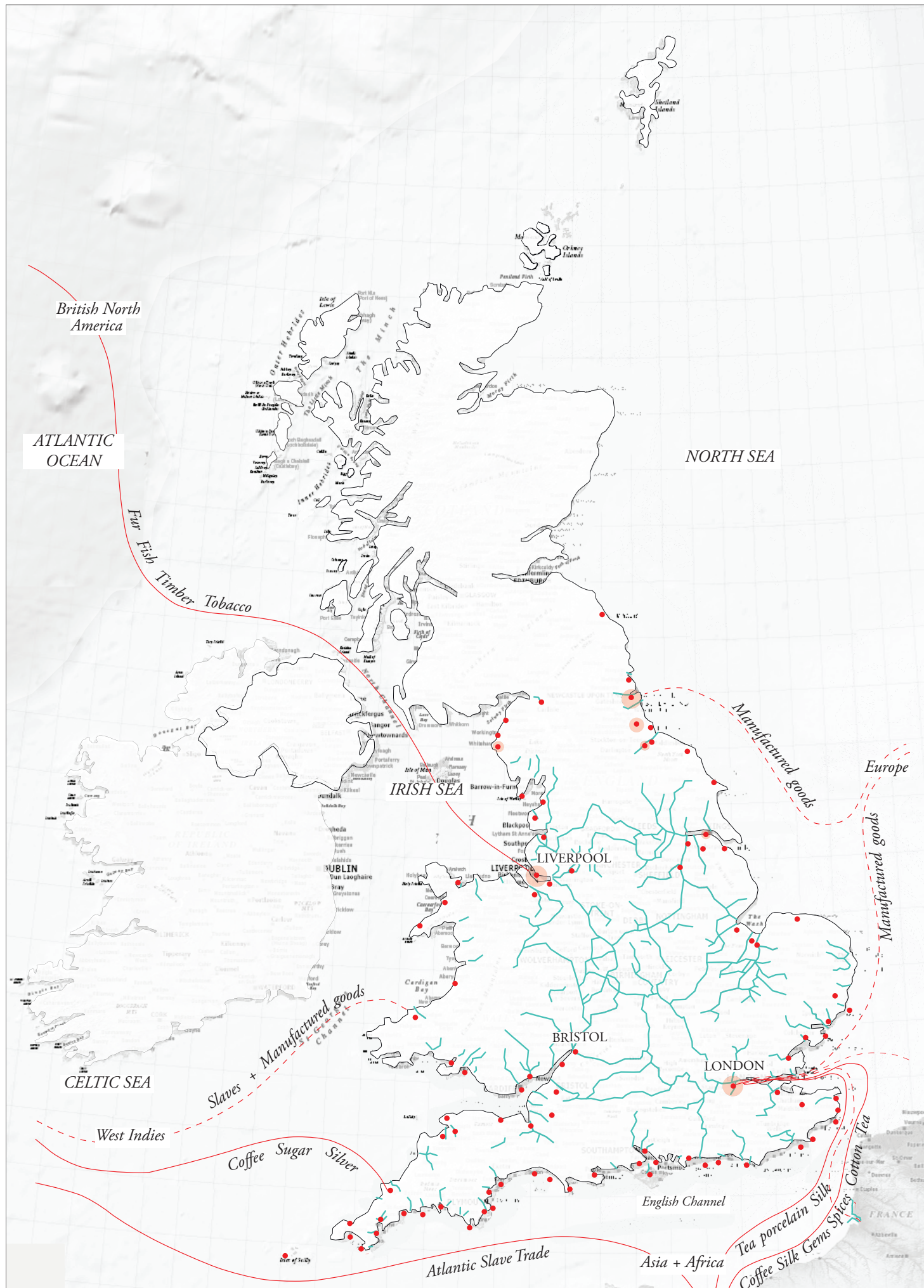


FIGURE 03: The British empire - flows of power 1900's

Source : <http://users.clas.ufl.edu>, drawn by author

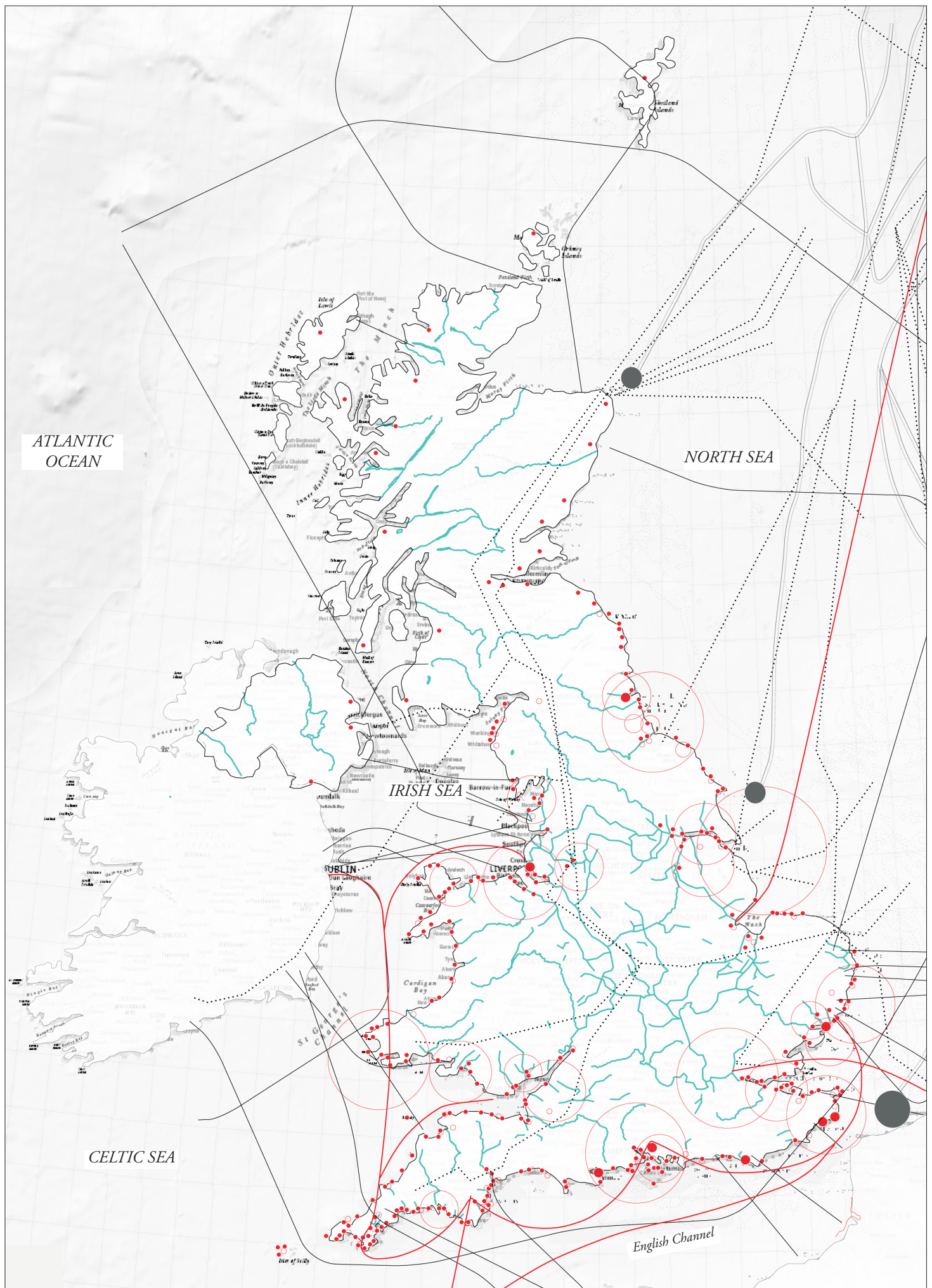


FIGURE 04 : *The British empire - flows of power today*

Source : <http://magic.defra.gov.uk>, drawn by author

Food was not just an adjunct to the British imperial might but fundamental to it (*Collingham L, 2017*). Even today, UK's relation with its former colonies is very much necessitated by its increasing food demands. In spite of being one of the largest global market, the UK currently imports almost 43% of the total food it consumes (*Gov.uk, 2018*). A recent government of UK survey¹ depicts this increasing dependency on its overseas market, by comparing the high import values of what have today become the most basic commodities (sugar, oils, coffee, tea, fruits and vegetables) with its insufficient export returns¹. India, Ghana, South Africa, Australia, New Zealand continue to be its biggest import markets till today.

Conclusion : The evolution of the role of the North sea from an unfamiliar territory - the paradoxical land of the sea monsters that could not be conquered to a new land with its own laws , boundaries and infrastructure had a key role in the longevity of the British colonial empire. The proximity to the sea was paramount for the creation of a decentralised empire and a system of highly advanced maritime logistics. This adjacency for many years has encouraged the globalisation of trade and the continued success of a decentralised system of food production, manufacturing, trade and profits . This decentralisation has irreversibly altered our modes of living and consumption and have led to a disproportionate increase in food demands in UK. Much like the colonial trade that lasted over three centuries the British food market even today is driven by its demand for 'exotic' tropical food. Considering UK's recent decision to leave the EU market the pressure on Britain's former colonies to meet UK's food demands will increase all the more. If efforts or not made to address the looming threat on global food demand vs supply chain we may as well be prepared for a modern ingemination of UK's colonial trade empire.

¹. Data source : Gov.uk. (2018). Food Statistics in your pocket 2017 - Global and UK supply - GOV.UK. [online] Available at: <https://www.gov.uk/government/publications/food-statistics-pocketbook-2017/food-statistics-in-your-pocket-2017-global-and-uk-supply>. The approximate import -export figures are - Sugar export - 300,000 billion pounds, imports - 1.5 billion pounds, Oils export - 750,000 billion pounds, imports - 2 billion pounds, Coffee, tea, cocoa export - 1.5 billion pounds, imports 4.2 billion pounds, Cereals exports - 2.75 billion pounds, imports - 4 billion pounds, Fruits and vegetables exports - 1.25 billion pounds, imports - 10.75 billion pounds

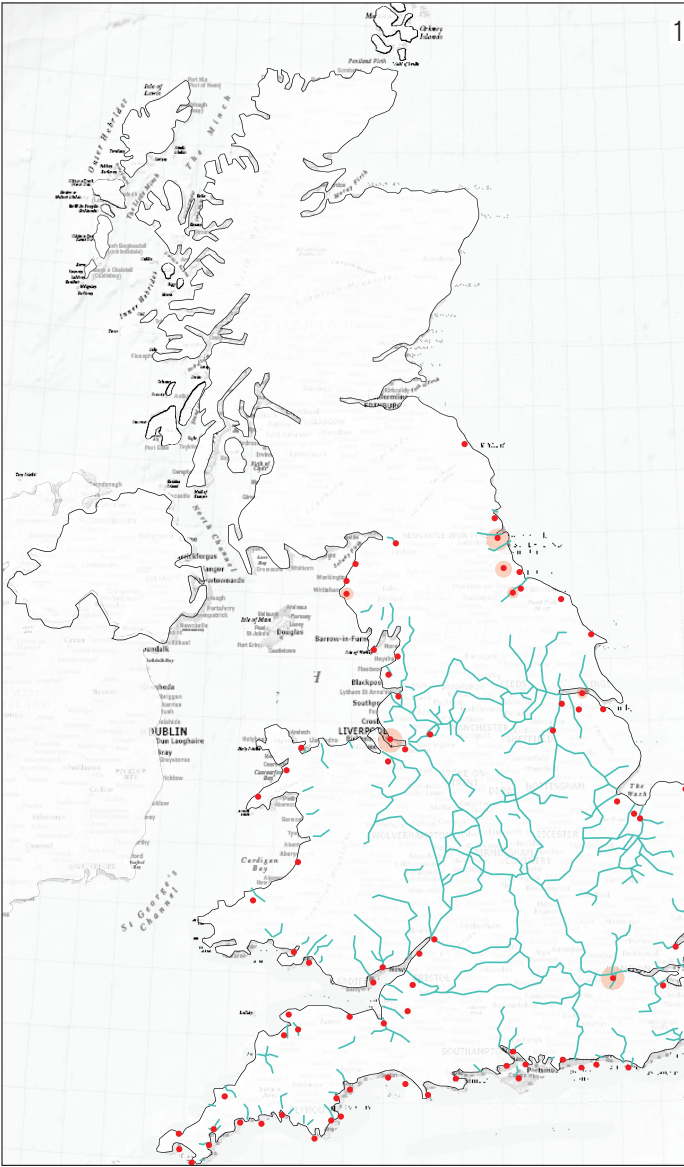
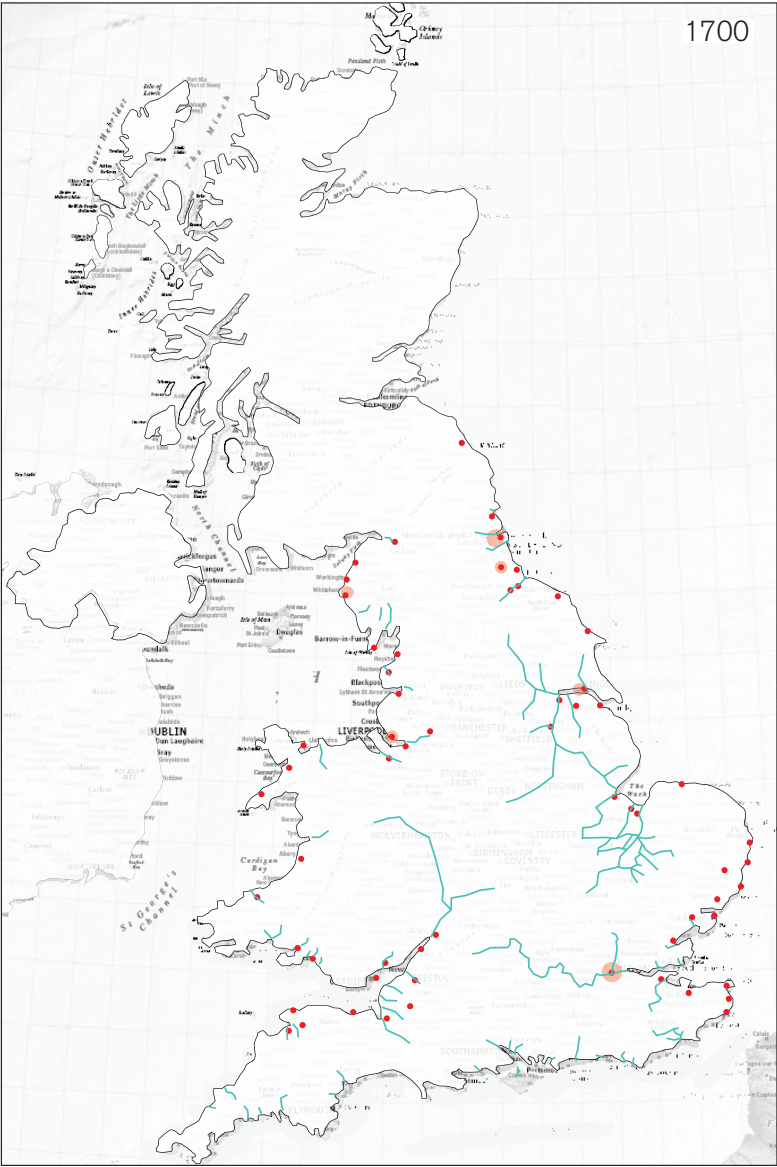
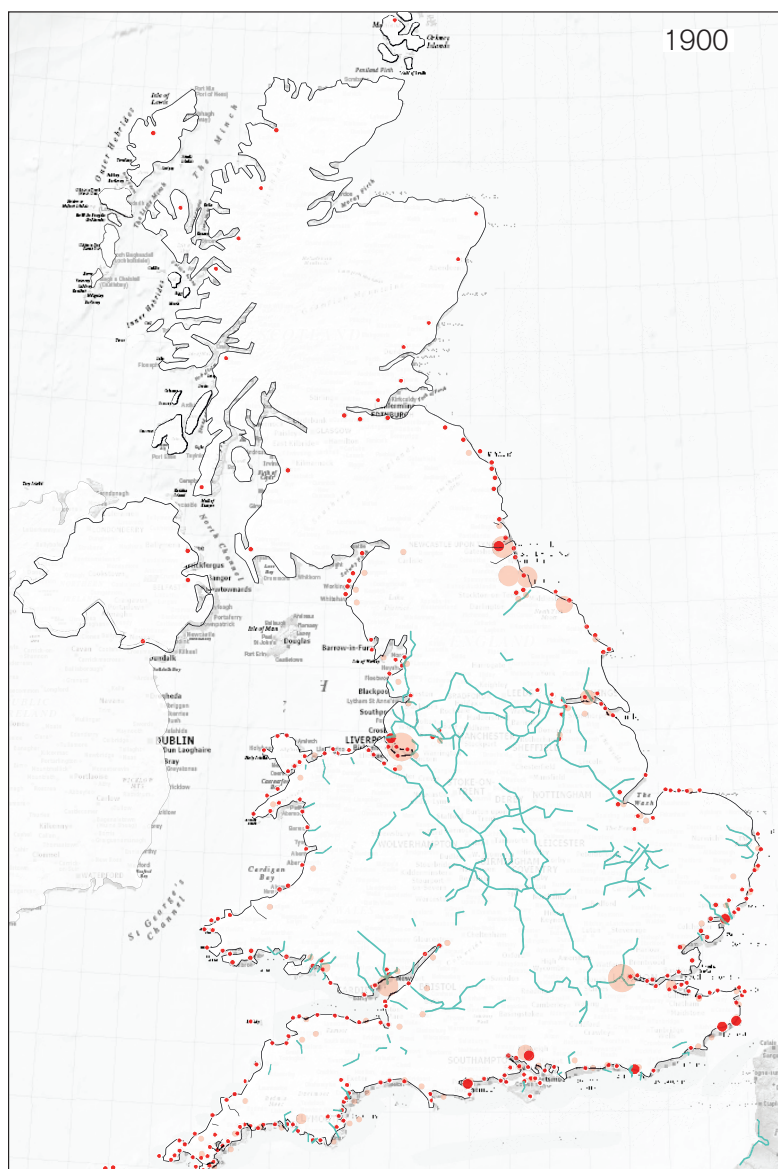


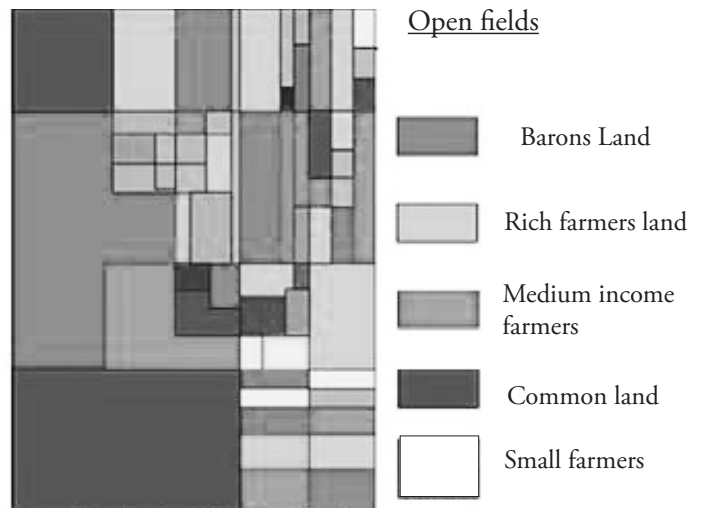
FIGURE 05 : *The growth of UK ports and waterways*
Source : MMO, 2016 , drawn by author



I / 02.

The empire and the city : *flows of change*

Although the globalisation of traded goods long preceded the industrial era , industrialisation really reshaped whole societies and cities (Clark , 2016) .Centuries of British global trade encouraged the growth of a complex system of internalised waterways and ports providing a lot of trade opportunities for the mercantile traders (see figure 05.) . By 1815 over 2000 miles of canals were in use in Britain carrying thousands of tonnes of raw materials and manufactured goods (White , 2009). Owing to the invention of steam technology in the 1700's, the availability of constant power supply made it possible to establish large scale mills, factories and gas stations . A surplus of cheap agricultural labour from the colonies led to severe unemployment and poverty in the rural areas of UK forcing them to migrate to these new port towns and cities in search of full time employment, paving the way for a large scale labour intensive factory system . New technologies in road construction and building further facilitated the connectivity between the newly constructed factories, mines and cities. The introduction of these new urban typologies



permanently altered the fabric of the city and marked the beginning of a new system of land use and ownership. The industrial housing (workshop dwellings, back to back's, through houses) is perhaps one of the most appropriate examples to explain this change within the cities. It was a housing typology that emerged during the industrialisation of the cities in UK where large privately owned land were progressively sold or rented to speculative house builders and textile merchants to build small scale mills and factories (See figure 06). While large scale mills and factories were located near the river or the coast for easy access to goods, raw materials and other resources, several small scale privately owned industries arose in dense neighborhoods. Apart from the considerable privatisation of land the introduction of railways began redefining the rural edges creating clear lines of segregation and connection at the same time.

An interesting development during this time was the evolution of the rural. The rural areas of England not only went through drastic changes in land use but also in land division and ownership. It evolved through two major forms of ownership : 1) . the open field system : this system allowed the arrangement of agricultural land into scattered strips that were communally regulated but privately owned. The scattering of strips of fields over 2-3 large unfenced fields encouraged common grazing which consecutively needed common decisions on crop types, planting and harvesting schedules. The land, labour and capital were completely private only the regulations on land use and grazing were collective (*McCloskey, 1991*). This system was superseded by 'The enclosures act' (See figure 07) which was in existence since the 12th century but only gained momentum during the 18th century industrialisation. The act allowed the enclosure of open fields and common land creating legal property rights to land that was previously regulated collectively.



FIGURE 07 : *Rural area : from and open field system to enclosures*

Source : <https://britlitwiki.wikispaces.com/The+Enclosure+Acts>

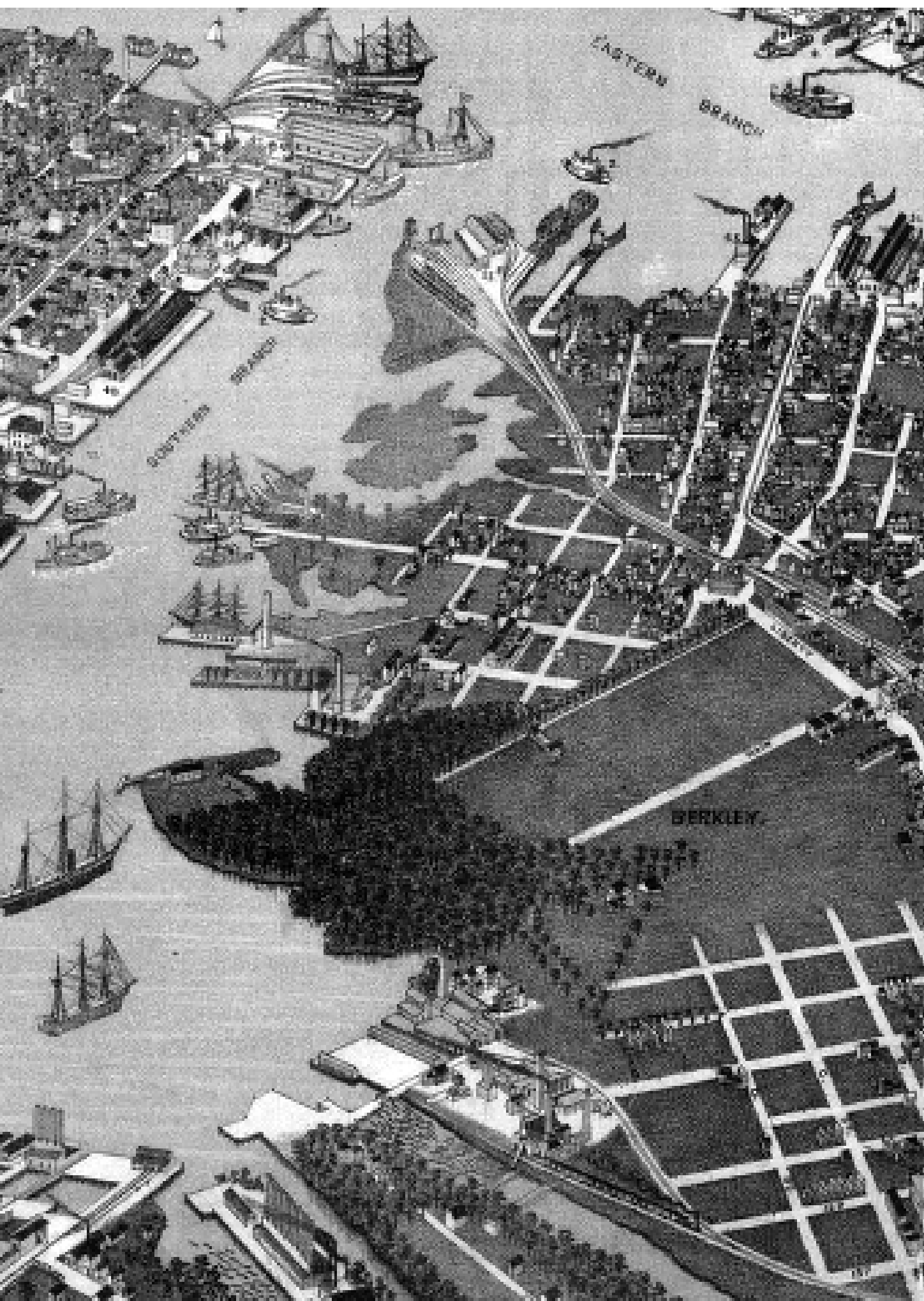
It eventually led to the privatisation of arable land either by landlords or by rich farmers and completely annihilated small scale farms. The insufficient compensation that these small farmers got in return forced them to leave the countryside and look for alternate job opportunities which worked perfectly for the industrial city that required a pool of cheap labour that could help in the functioning of the newly constructed factories and mills.

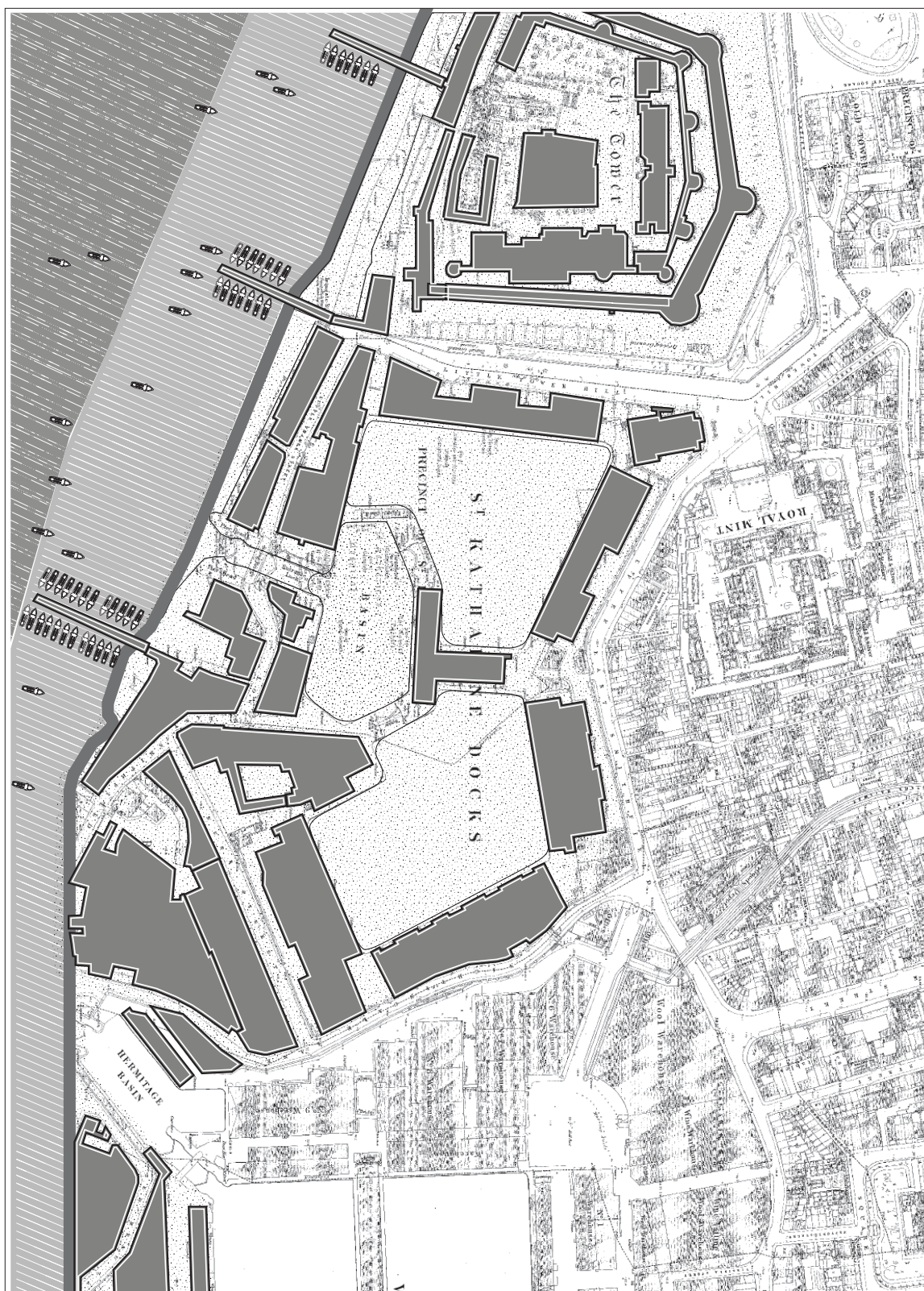
Meanwhile the regulated control on arable land allowed the private owners to make innovations that improved the yield of crops and create a surplus of food that was enough to feed the growing population. Weekly agricultural and livestock markets became more popular and consumers not only had access to local goods but a variety of goods that were imported from the British colonies (See figure 10). Many of these imports originated in the expanding plantations in Africa, South America and Caribbean where merchants were heavily dependent on African and Indian slaves as their primary source of labour (White , 2009).



*Birds eye view of Norfolk, Portsmouth and Berkley
 , drawn by Augustus Koch , 1840.*

Source : <https://www.loc.gov/item/75696646/>



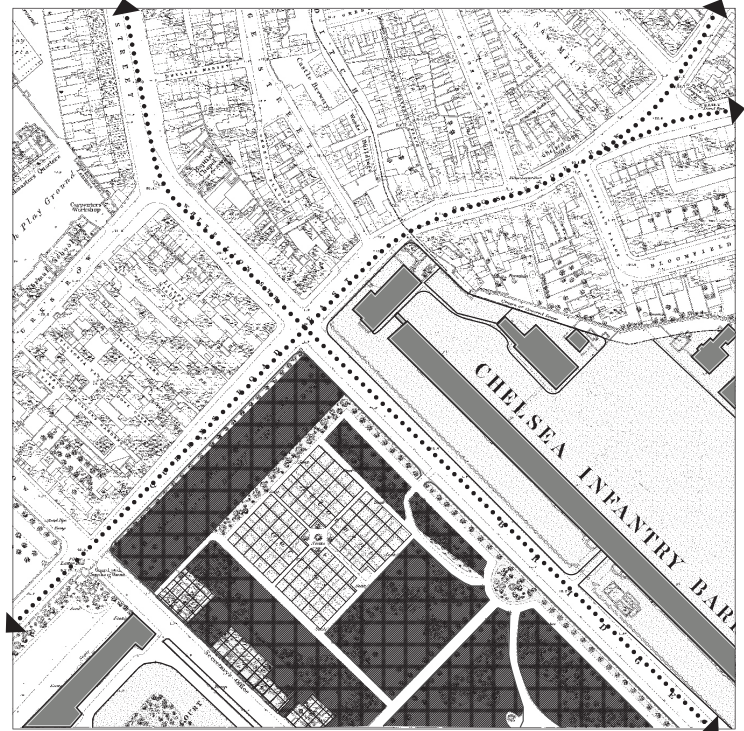


Docks and warehouses, Thames North bank , 1800's , Source Digimap.edu, drawn by author



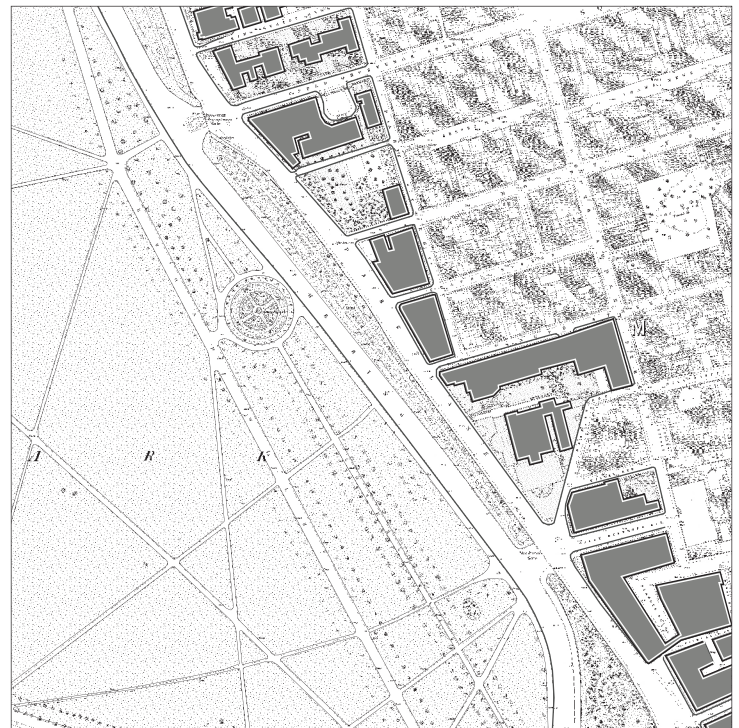
Large scale mills on Thames north bank , 1800's , source Digimap.edu, drawn by author

Industrialization and the changing city and rural



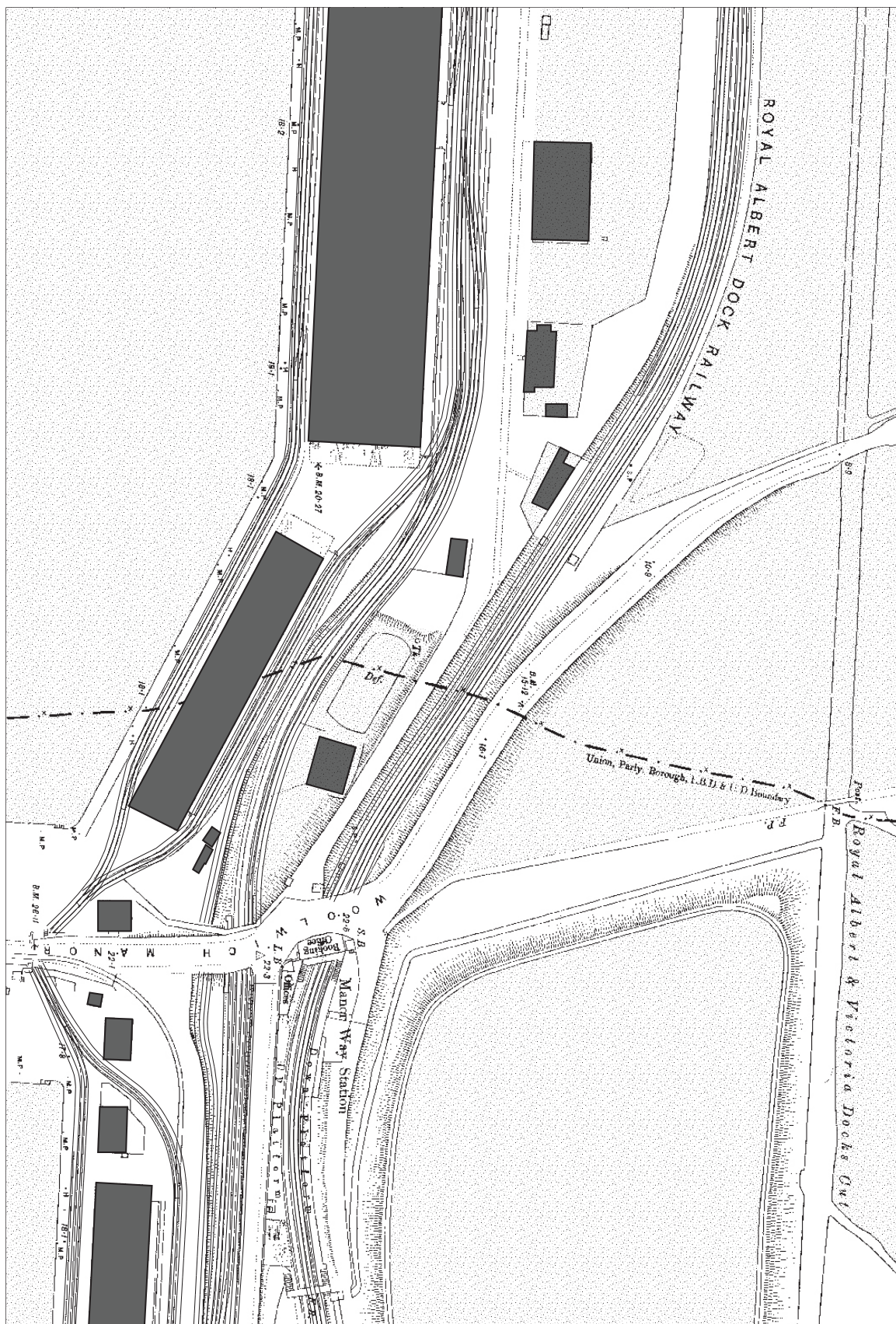
Allotment gardens , London, 1800's

Source : Digimap.edu , drawn by author



Park

Source : Digimap.edu , drawn by author



Railway docks, City of London , 1800's

Source : Digimap.edu , drawn by author

Industrialization and the changing city and rural



Newly built private estates within rural areas, City of London , 1800's, Source : digimap,

Source : Digimap.edu , drawn by author

“The enclosure of the ‘commons’ along with free trade and importing of food and commodities from its colonies via the North sea played a very important role in creating a highly urbanized economy that dispossessed a large urban proletariat from the country side and led to the decline of the small farmers”

Conclusion : The proximity to the North Sea not only facilitated decentralised production and manufacturing it completely altered the urban form of the city and created new social hierarchies within communities. The industrialization of cities gave new meaning to both land and sea. Land was no longer only a space of production , it became a commodity and a means of progress and survival in the industrial era. The arbitrary privatisation of land could have been directly responsible for the depopulation of the rural and the decline of small farmers. The enclosure of the ‘commons’ along with free trade and importing of food and commodities from its colonies via the North sea played a very important role in creating a highly urbanized economy that dispossessed a large urban proletariat from the country side, concentrated landownerships and encouraged the creation and privatisation of farms far larger than any country in Europe (Fairlie, 2009). Such a system not only disturbs social equity it also prioritizes capital gain over sustenance . In a post brexit UK this could prove to be a very unsustainable solution for a future that needs to be more equitable, responsive and most importantly self-sufficient.

||



[Food from the empire]

II / 01.

Brexit and the vulnerability of an import based market

[UK's exit from the European union single market and possibly its customs union indicates a need for exclusive trade privileges. Presently, the UK contributes 1/6th which is 16.2% of the GDP of the EU market and exports 40 billion eur worth of goods every year (*Ec.europa.eu, 2016*). In the context of trade, two main issues are of utmost concern 1). The British farming industry's dependence on the EU CAP subsidies and standards which after Brexit will necessitate major restructuring and reforms and 2) The British food industry's increasing dependence on its import based market which will pave the way for major agricultural reforms post UK's exit from EU.]

[The Common Agricultural Policy (CAP)] : The CAP is EU's largest single item of expenditure that takes upto 40% of the EU's budget. A British farmer receives around 3 billion pounds of subsidies that makes about 50 -80% of his/her total income (*Helm, 2017*). Presently, the policy after several reforms provides EU farmers with a Single Farm Payment which is a payment per hectare of land ownership, subject to reduction if the farmers do not comply to adequate land, environment and food safety measures. The CAP mandate is known to be a production - oriented policy that provides farmers favourable amounts of subsidies based on the crop types. One of the most visible effects of such a policy on British farming is the fact that it rewards a farmer based on the size of his/her farm and the type of produce without setting any requirements for production quantities and per hectare yields. This encourages the inefficient use of land and ends up disproportionately profiting the larger farms that have more farming area per hectare even though a smaller farm that receives lesser subsidies can have a higher per hectare yield. Today UK has several large independently owned factory farms and estates that alone receive 500,000 pounds or more from the EU annually (*Web.archive.org, 2010*). This is perhaps one of the reasons for UK's increasing dependence on its import market as the subsidy driven farming industry favours a produce that allows more monetary benefits without making any effort to ensure the maximum and efficient utilisation of available land. Furthermore Agricultural farming in UK is not a lucrative profession as farmers currently earn more from the EU subsidies than from their farm business (See figure 11). The situation will only exacerbate in the coming years with UK's exit from EU and increasing food demands that will come with the increasing population. Necessary reforms must be introduced in the near future to tackle farm subsidies, ensuring maximum per hectare yield and maintaining a balanced demand and supply.]

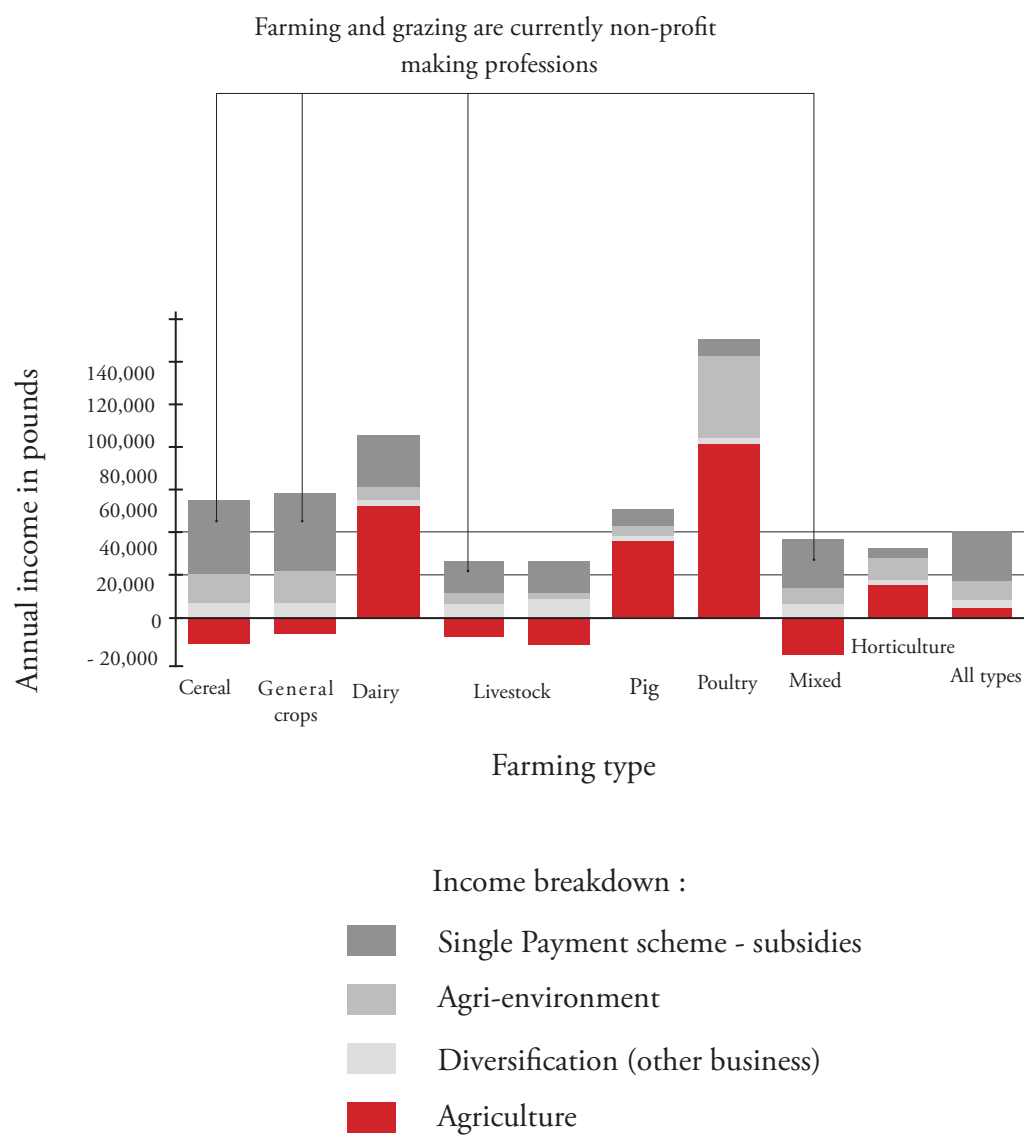


FIGURE 11 : *Farming profits UK*, Source : Defra, drawn by author

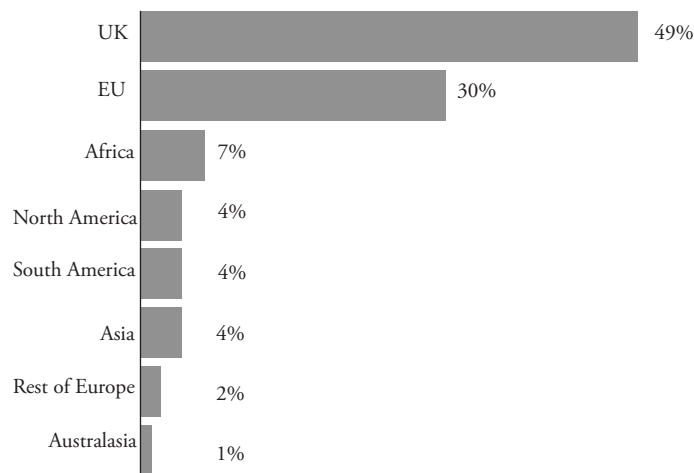


FIGURE 12 : *Food import supplied to UK in percentage*, Source : Gov.uk, drawn by author

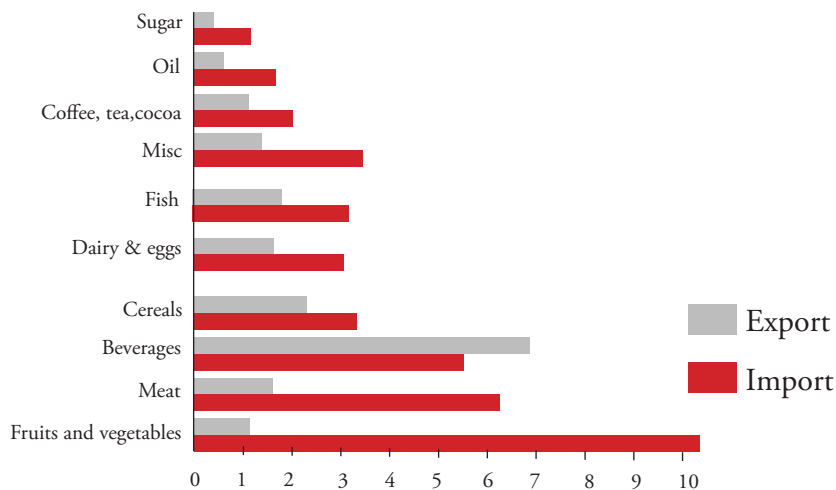


FIGURE 13 : *UK food export Vs import*, Source : Gov.uk , drawn by author

[**Import dependency** : Presently, the UK imports about half of the total food it consumes (see figure 12). While it is still one of the largest markets for commercial beverages it is primarily dependent on the overseas market for its basic food needs - coffee, tea, dairy eggs and most importantly for meat, fruits and vegetables (see figure 13) . UK's self sufficiency rate has insidiously declined over the past 30 years from 78% to the current 62% and it has been constantly trying to replace this steady erosion in the farming industry with food imports. Over the years this has had dangerous impacts not only on the farming industry in the UK but also on its biggest import markets because of the increasing competition of agricultural products, climatic events and land degradation and the disbalance in the demand vs supply ratio.]

[**Conclusion** : As discussed in Chapter I the shift from the open field system to the enclosure system has had adverse impacts on small farmers and led to concentrated land ownership. The effects of this can also be seen in the way the CAP subsidies are defined and distributed. The

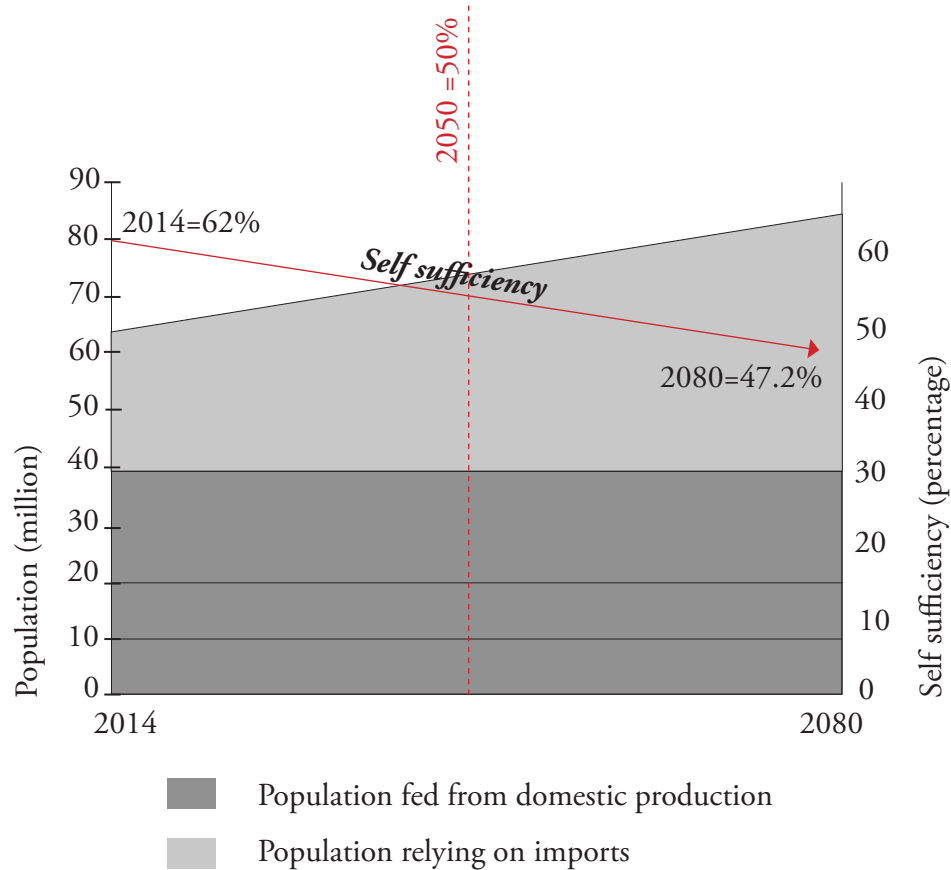


FIGURE 14 : *UK population Vs self sufficiency*, Source : NFU 2017 report , drawn by author

lack of a system to measure and / or reward efficiency in productivity and crop yields has allowed the large farms to be sold/rented for commercial use leading to a gross misuse of valuable arable land. Any reforms in the subsidies for large scale individual landowners and factory farms by the EU has been met with strong opposition and lobbying. In many ways the reappropriation of land boundaries and the abolition of the more impartial open field system has directly resulted into years of unfavourable lobbying and gradually reduced the productivity due to excessive commercialisation and dependency on subsidies. The NFU has also predicted that at the current productivity rate the UK's self sufficiency will drop to as low as 50% by 2050 (see figure 14). If necessary reforms especially with respect to land re-distribution and productivity are not made soon the pressure on UK's former colonies , that till today are its biggest import markets to produce enough to meet its food demands will increase more].

II / 02.

Urban growth and the future of rural countryside

[The population of UK is going to reach 75million by the year 2050 for which about 300,000 houses need to be provided each year (*Randall 2017*) . Currently, the planning policy in UK prohibits any kind of development within the green belts that act as an intentional buffer which restricts the outward growth of its cities. Thus, to tackle the growing demand for social housing the NPPF (National planning policy framework) proposes removing a critical policy that recognizes the importance of UK's rural countryside , indicating the possible availability of this valuable land for redevelopment. A recent CPRE (Campaign to protect rural England) report indicated that almost 55% of UK's rural countryside is at a risk of urbanisation (*Lainton, 2012*). While most of this land has been earmarked for future housing (see figure 16) large developments and infrastructure projects have also been proposed. A majority of agricultural production and farming also happens within this rural countryside which means its newly imposed unprotected status could have direct implications on UK's food supply. For an industry that is anticipated to suffer from shortage of investments due to lack of sufficient subsidies post Brexit , redevelopment of arable land will prove to be catastrophic.]

[Conclusion : The increased privatisation of rural countryside has made it even more vulnerable to sporadic and speculative development. While on one hand it can be seen as the only space available for the growth of the existing cities or the formation of new ones since the government owned green belts still have their protected status on the other hand it also happens to be a very crucial productive space within the urban fabric of the city. There is an urgent need for a more holistic approach to rural planning that must not only focus on the interests of the rural community but, must also take drastic measures to reappropriate land and ensure maximum productivity.



■ Undesignated countryside
 ■ Protected green belts

FIGURE 15 : *UK undesignated countryside*
 Source : CPRE 2012 report



■ Areas included within proposed local plans

FIGURE 16 : *Countryside areas included within the local plan*
 Source : CPRE 2012 report



■ Grade 01 ■ Grade 02 ■ Grade 03

FIGURE 17 : *Existing arable land* , Source : digimap.edina.uk

Climate risk and land availability

[Since food supply in UK is heavily import dependent , the availability of food will be directly affected by both loss of land and environmental risks in the UK as well in its supplying countries. While the highest concentration of arable land in UK lies in the eastern and south eastern midlands, most of this land is also at the risk of heavy fluvial and coastal flooding (See figure 19), presently many dense urban areas also lie within this zone. Furthermore, as discussed in the previous section the fact that this available rural land will also play a significant role in accomodating the future housing makes flood risk assesment, management and rehabilitation a necessary prerequisite for continued productivity and any future large scale planning.

The past several years has also seen a gradual decrease in domestic land used for food and feed within the UK. According to a recent study done on the impacts of UK food supply on the global croplands , UK imports over 50% of its food and feed whereas 70% and 64% of the associated cropland and GHGE (greenhouse gas emissions) are located abroad (*de Ruiter. et al. , 2016*). In many ways UK’s food trade still has a colonial understructure as it continues to rely on the flow of goods and raw materials from its high yielding import markets while it has a In this context while UK makes significant contributions towards consumption-based CO2 emissions it simultaneously displaces the production-based emissions to its former colonies. This not only leads to the degradation of valuable productive land but also has significant impacts on the quality and accessibility of water within these countries Another major factor to take into consideration is the projected population growth in UK’s supplying countries. In many of these countries for example -Australia, India and Indonesia the population is expected to grow to an approximate 150% (See figure 18).

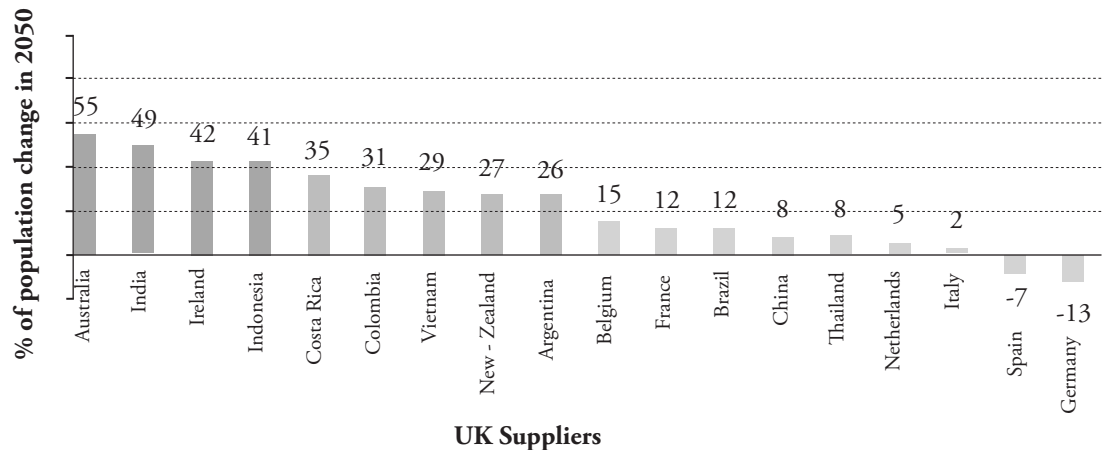


FIGURE 18 : UK suppliers projected population change 2009 - 2050, Source : Optimum Popoulation trust - UK’s food supply vulnerability report, drawn by author

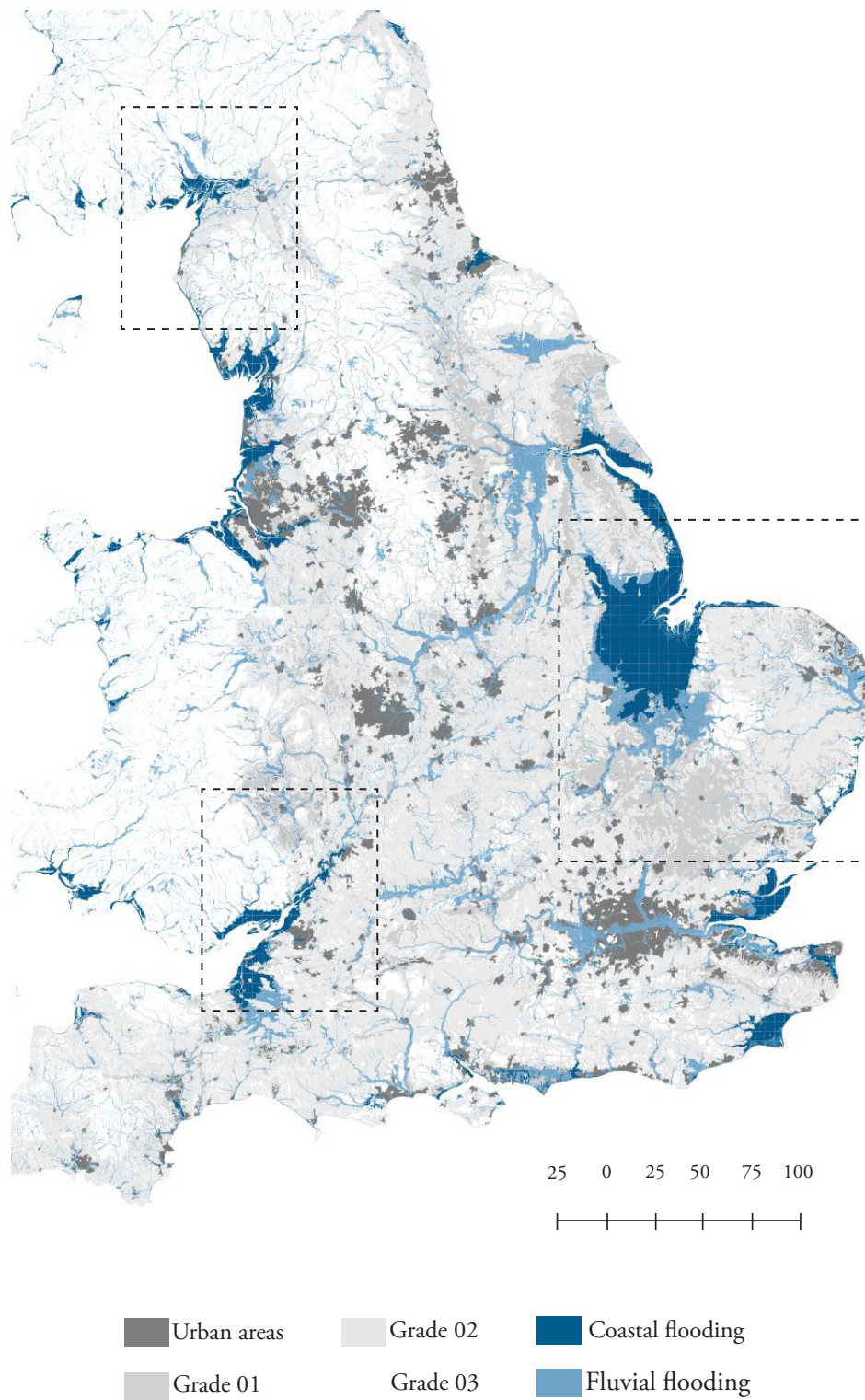


FIGURE 19 : UK, England - agricultural land prone to fluvial and coastal flooding
Data source : digimap.edina.uk, drawn by author

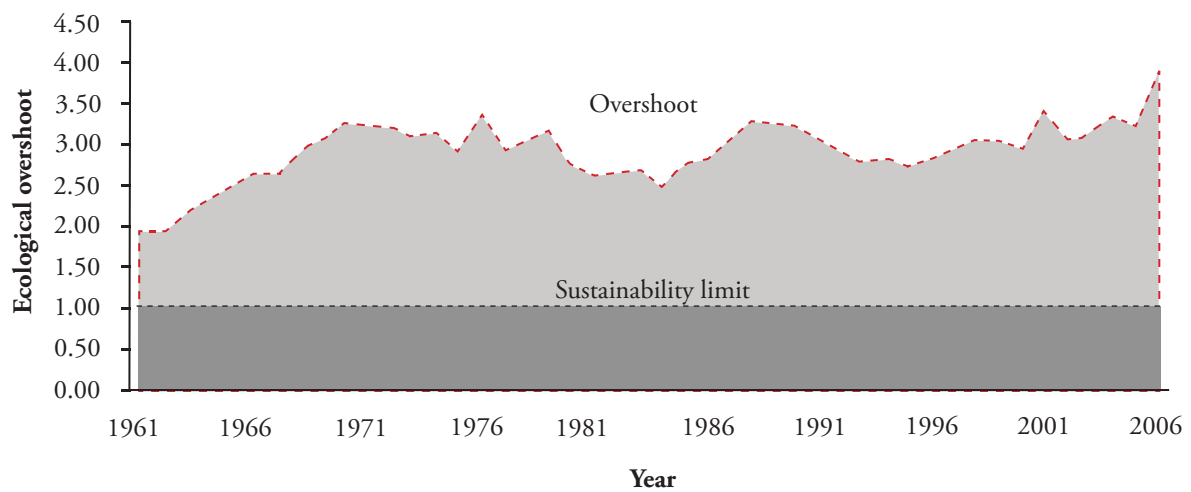


FIGURE 20 : *UK's historical ecological overshoot*, Source : Global footprint network , drawn by author

“UK can provide 0.62 and 0.11 global hectares (GHa) of cropland and pasture land respectively for each individual, on an annual basis. However, presently the UK consumption per capita corresponds to 0.93 and 0.20 Gha of crop and pasture land that is almost 1.5 times the sustainable limit (biocapacity)” - (*Roussou, n.d.*)

The current ecological footprint analysis of UK's supplying countries indicates that the projected population growth combined with the present food and lifestyle trends will result in almost 70% of the supplying countries to experience land deficits with 63% of the major suppliers facing cropland or pastureland deficit and 37% experiencing fishing ground deficit (See table 01) (*Rousson, n.d.*).

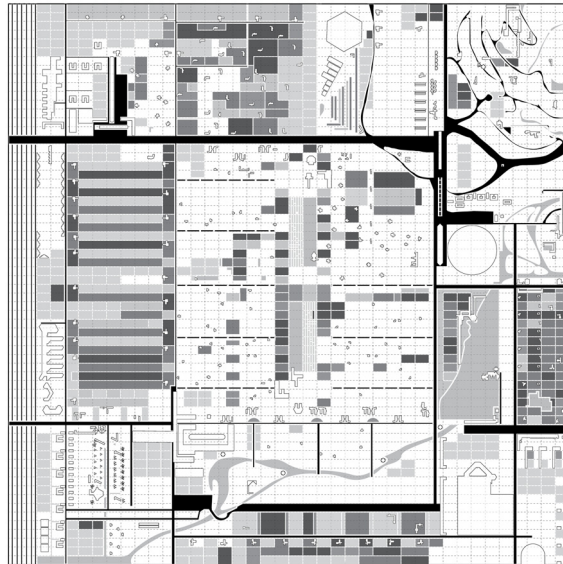
Supplier	Cropland	Pasture land	Fishing grounds
Argentina	28	9	156
Australia	18	-52	203
China	-7	-28	63
India	-74	-24	69
Indonesia	-13	-30	127
Spain	-8	-5	-57
Thailand	0.3	-0.2	-11
Vietnam	- 3	-0.4	2

TABLE 01 : *UK suppliers land deficits / surplus*

Source : Optimum Popoulation trust - UK's food supply vulnerability report, drawn by author

[**Conclusion**] : The given figures clearly reveal UK's continued dependency on its former colonies and can be seen as results of several years of colonial trade. This modern day version of globalised colonial trade has had significant impacts on the cropland availability and depletion of resources globally. While UK's industrialisation marked a clear shift from its agrarian economy to one based on manufacturing the same cannot be said for its colonies. Its supplying countries had to struggle with rampant, uncontrolled industrialisation which was a result of their urgent need to participate in the global economy and recover from the loss of years of colonial exploitation, while ensuring the survival of its agrarian industry . Furthermore, presently the EU CAP laws are structured in such a way that it encourages UK to import land and GHGE (green house gas emissions) intensive commodities from its former colonies while importing on an average low resource intensive products from the EU. There is also a steady decrease in domestic land used for food and feed including the amount of domestic croplands within UK used for exports which suggests that the increase in food imports is a result of actual displacement of cropland and not because of increase in food demands.

The decline of UK's rural economy and population during the industrial era not only facilitated industrialisation within UK but also led to the gradual outsourcing of all kinds of production demands to UK's former colonies. This outsourcing was further expedited by trade laws established under the newly formed post war - European union and continue to be camouflaged under the label of 'trade benefits' within UK's Commonwealth policies today. In spite of the large scale outsourcing of its food and productive land demands, UK's current consumption rate is indicated to result in a domestic cropland and pastureland deficit of 13 million hectares and 16 million hectares respectively (*Rousson, n.d.*) (see figure 20.). Lastly , climate risks are a threat to every nation , although the effects of this might differ especially considering the fact that many of UK's supply countries could expect a comparatively exponential growth in population which coupled with land degradation due to climate change risks can have disastorous impacts on food supply globally . In this context it becomes extremely critical for UK to shift towards a self sufficient system of food production that should specifically address land optimization ,flood risk management and a drastic change in its consumption patterns .



[*The new rural city*]



FIGURE : *Exodus, the voluntary prisoners of architecture The Allotments, project, 1972.*
 Source : MoMA Collection © 2013 Rem Koolhaas.

Once, a city was divided in two parts. One part became the Good Half, the other part the Bad Half. The inhabitants of the Bad Half began to flock to the good part of the divided city, rapidly swelling into an urban exodus. If this situation had been allowed to continue forever, the population of the Good Half would have doubled, while the Bad Half would have turned into a ghost town. After all attempts to interrupt this undesirable migration had failed, the authorities of the bad part made desperate and savage use of architecture: they built a wall around the good part of the city, making it completely inaccessible to their subjects

III / 01.

The Question :

Among the several events that have shaped UK's present , the British colonial empire could be one of the most significant ones. UK's shift from an agrarian economy combined with maritime logistics gave birth to a system of decentralised mass production that consequently changed the lifestyle of its people and continues to dictate their patterns of consumption till today. The era was especially crucial in allowing the creation of companies that acted as individual sovereigns protected by the feudal law but generally free to act (*Klein, 2015*) which subsequently brought the rise of the urban (industrialised city) . This shift could not have happened without two critical changes - 1). the progressive privatisation of productive land that authorized its repurposing and 2). the subsequent decline of the rural that was instrumental in providing competitive labour for the new industries.

For several years architects, urbanists and theorists alike have tried to challenge the idea of this post-colonial city, either by creating their own versions of a new rural or by reimagining the existing urban. A crucial matter of contention in these projects has been that of individual choice and freedom. Many utopian ideas for the new rural interpreted this choice via a democratic spatial rearrangement of the rural in the form of a systematic sprawl that can provide an abundance of choices that were otherwise absent or difficult to access in the city, for example - Wright's *Broadacre City*, Kurokawa's *Agriculture City* . In doing so these projects were able to provide a more sustainable as well as economical alternative for the use and building of the various elements of the city (roads, pipes, housing etc.) that allowed the system of individually owned low density sprawl to be more affordable . By overlapping systems of production and living the projects were also able to build a strong critique against private ownership, conspicuous consumption and accumulation of wealth (*Waldheim, 2010*) . In contemporary theory similar concepts can be seen in Andrea Branzi's *Agronica* and reinterpreted through MVRDV's research on densities and reimagined cities. Both these examples take the idea of the concept for a new city a step further by proposing what one calls 'weak urbanism' and the other calls 'lite urbanism'

They talk about a system of flexible sprawl with its own logic and logistics , one that can accomodate change with such agility that parts of it can be completely redesigned with change in urbanistic goals and within a relatively short time (*Maas, Rijs and Koek, 1998*).

UK's food insufficiency cannot be solved only by increased productivity, the problem is manifold. By 2050, UK will not only be the most populated country in Europe it would also have lost significant amounts of rural land either due to urbanisation or due to the increased risk of flooding. Furthermore, the rate of food consumption in the country is such that inspite of a 60% self sufficiency rate it (see figure 14.) is one of the top 20 food consumers globally(*Max Roser and Hannah Ritchie, 2017*) with a current overshoot of 7.37gHa per person (*National Footprint Accounts edition ,2016*). Thus, UK's food sufficiency also demands simultaneous transformations in lifestyle , governance, land allotment and ownership.

This thesis will try to explore the relevance of the aforementioned systems by proposing a new interpretation of the rural city. Using the theoretical knowledge gained from the various approaches to agrarianism the project will try to create a contextually sound model for rural sprawl based on the morphological specifications of the region while simulatenously challenging the ideal standards of living , productivity and consumption. The main question this project will research on is as follows :

Can reappropriating the rural to accommodate new possibilities of production, living and occupation to create the conditions for food sufficiency and help subvert the pressure of UK's food demands on its former colonies in a post Brexit future?

Just as the industrial city arranged itself within its own logic of grids and infrastructure, the project will try to propose an ideal system of spatial arrangement within the vast rural countryside of England. Using the strategic location of UK (esp. its proximity to the North Sea) the project will be able to address the issue of food sufficiency at various relevant scales : 1). at the urban scale where the project delas with sytems of land allocation, governance, living and production 2). the regional scale where the project explores the relationship between the urban and the rural via systems of food infrastructure (resources, raw materials,industries, highways, rural-urban edge) and 3). the global scale at which the project tries to understand the impacts of a new system of production on global environmental and food accesibility issues.

Before proceeding with the design the project will investigate various approaches to agrarian urbanism via four relevant projects that were already discussed biefly in this section : Frank Llyod Wright's Broadacre City, Andrea Branzi's Agronica and MVRDV's Plant city and Pig city. Furthermore, the project will also look at the various possible scenarios for reimagining the consumption patterns and footprint of the projected population using two research papers : Optimum Population Trust's research on UK's food supply vulnerability and National Farmer Unions - Backing British Farming.

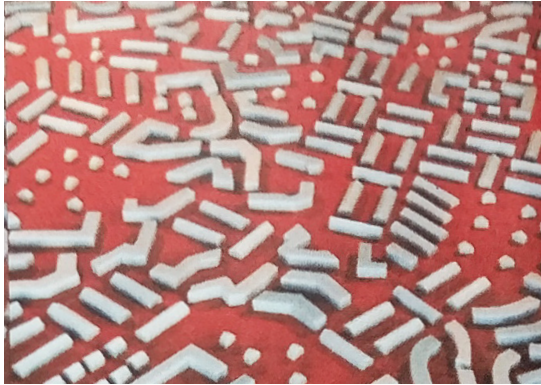


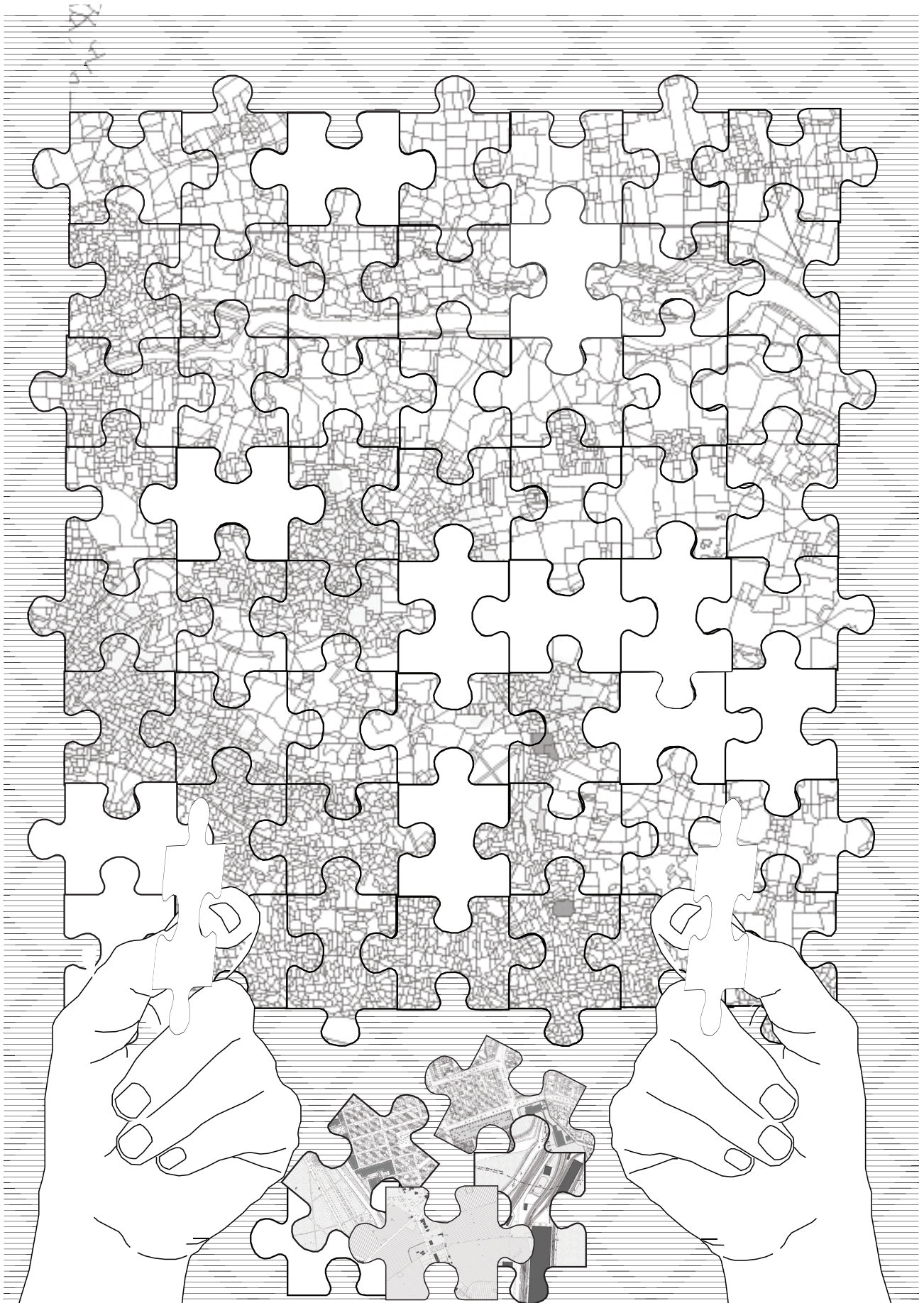
FIGURE 23 : *Different densities of the 'lite city',*
Source : (Maas, Rijs and Koek, 1998)

III / 02.

The Hypothesis :

With the decline of the industry coupled with advancement in technology the post - industrialist city experienced a new wave of capital flow and investments that generated diverse forms of occupation and attracted people from various economies. The rural on the other hand continued to be increasingly detached since its only means of sustenance was agriculture. The decline of the small farms and the progressive privatisation of its land led to the repurposing of productive land into crucial services that serve as a necessary supplement to the new economy of the post industrial city. This continued subjugation of rural land has led to a severe lack of occupational and living diversity and has also dispossessed the rural of its means of agricultural sustenance . Seeing that the physical decay of the rural brought by the post-colonial industrialisation of the city has had long lasting impacts on the availability and productivity of agricultural land, the project recognizes the importance of de-colonizing the 'occupied' rural as the first step towards food sufficiency.

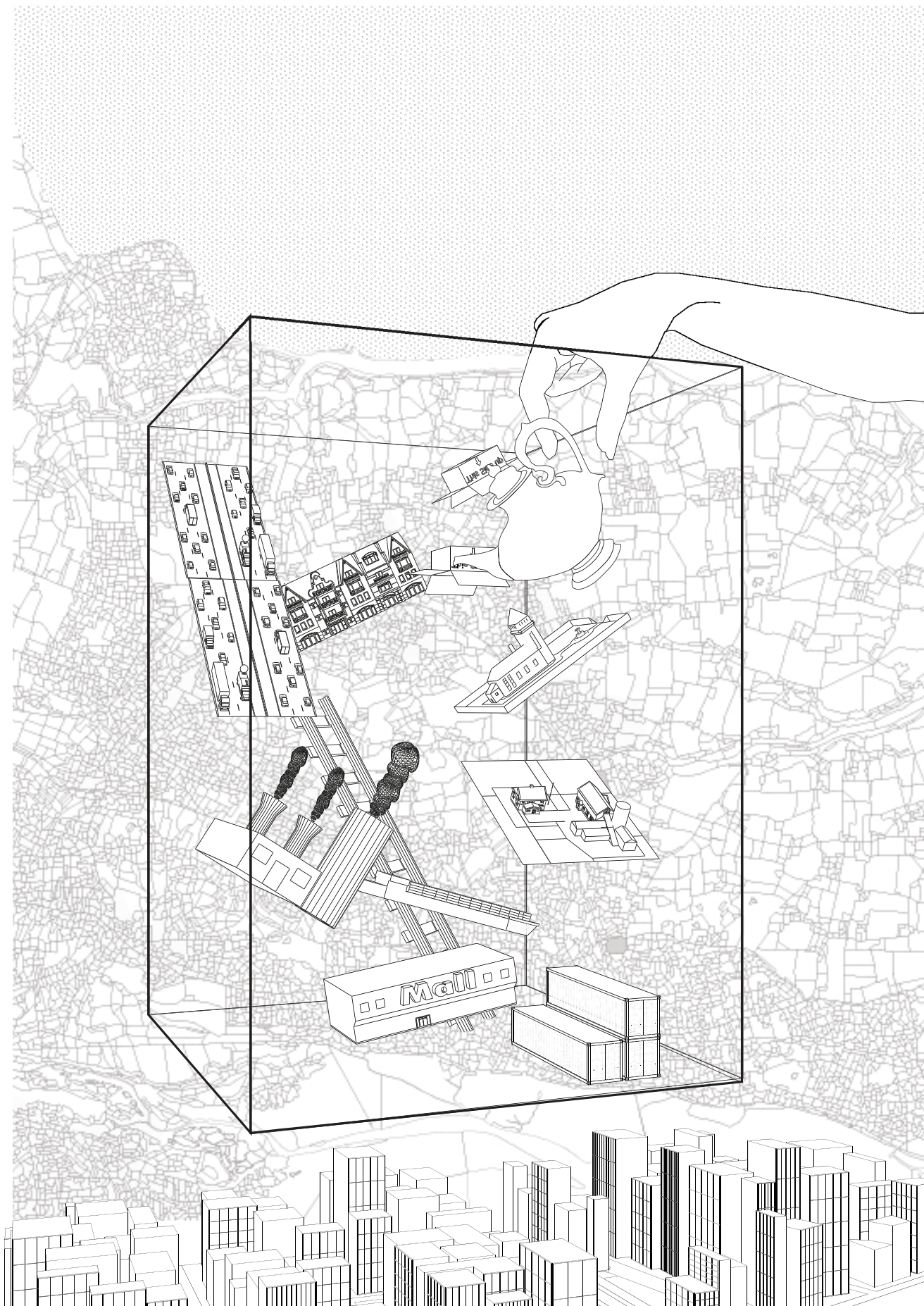
To initiate this process , the project will strip the rural countryside of its existing spatial logic that is reinforced through the rigid lines of ownership and property , to reveal an endless plain of cultivated landscape that serves as an infinite field of spatial possibilities. By superimposing new form of spatial appropriation on this tabula rasa the project will be able to eschew the traditional distinctions between the urban and the rural . By this means the project no longer sees the rural as the other extreme of the city but as an extension of it. This new extension of the city produces too , but unlike the industrial city, the means of production here is agriculture. The spatial logic for the new city is derived from the superimposition of the systems of living and farming, that will encourage new possibilities for production, habitat and occupation within the rural.



Stripping the rural of its existing spatial logic that was the result of its colonial industrialisation

Drawn by author

Seeing that the physical decay of the rural brought by the post-colonial industrialisation of the city has had long lasting impacts on the availability and productivity of agricultural land, the project recognizes the importance of decolonizing the 'occupied' rural as the first step towards food sufficiency.

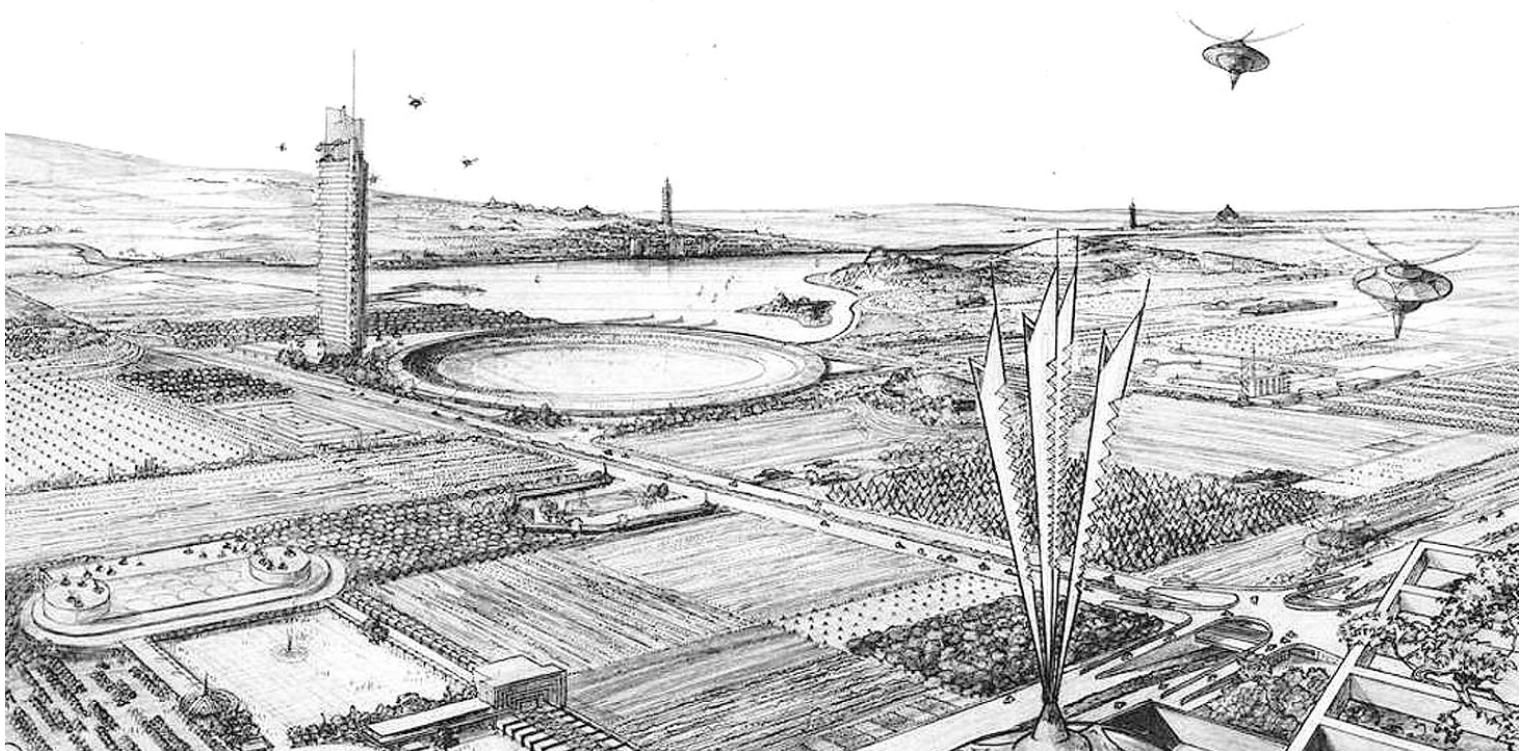


Setting aside the elements of the industrial city to be replaced back only after a new land order is established

Drawn by author

III / 03.

The elements of the new city



Broadacre City vision, Frank Lloyd Wright, 1935, Source : www.moma.org

The Broadacre city , Frank Lloyd Wright

[Wright's vision for the Broadacre city puts forward two main assumptions that are central to the discourse of agrarianism - 1) Cities will continue to be decentralised and 2). Landscape would become the primary medium of urban form (Waldheim, 2010). Taking these assumptions into consideration Wright proposed a network of territorial urban infrastructures that would establish new relationships between the existing natural environment and the post industrial landscape that is currently occupying the rural. Fundamental to the logic of the city was the concept of democracy. The project visualises the new rural city with a physical and social arrangement that embodies and reinforces the ideals of a democratic city where each resident has an abundance of living and occupational choices . With the Jeffersonian grid as its principal ordering system the project was able to divide the unbound landscape of the rural into various private gardens, small farms, housing blocks , civic services etc. Each resident was given the smallest available unit of land within the broadacre grid that is 1 acre in this case to be built on and cultivated by the owner. The overall pattern of the city was also interspersed with several small and large scale industries and public services.

Although the vision for a democratic city is much a needed and relevant matter of contention in the urbanism discourse till today, the implications of such a proposal might be questionable considering that we are now moving towards a future where resources and land are becoming increasingly scarce and expensive. Perhaps Wright's proposal can become less of a utopian vision and more of an applicable urban model if its systems of governance and ownership are reinterpreted within a more sustainable framework. Although the model displays the flexibility to accommodate the various topographical features it might encounter on site, the status of the previously urbanised areas remains an open question. Considering that more and more people would live in fast growing urban areas, the connection to the city and its impact on the physical and social arrangement on Broadacre becomes a very crucial make or break point for the model.]

Perhaps Wright's proposal can become less of a utopian vision and more of an applicable urban model if its systems of governance and ownership are reinterpreted within a more sustainable framework.

Relevant spatial strategies :

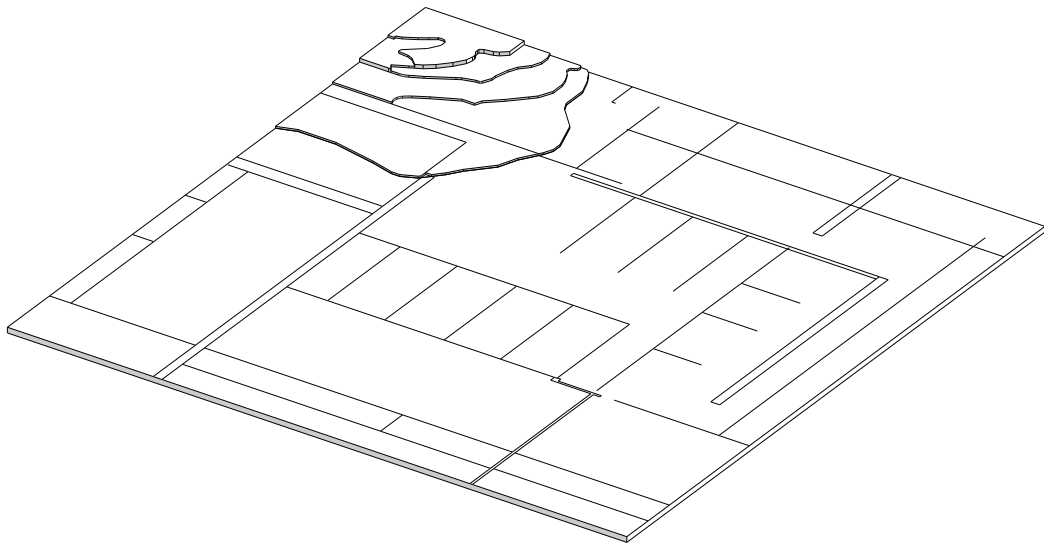
- Sprawl as a model of urban growth
- Infrastructure grid as a tool for land reappropriation
- Occupational diversity through various landuses

Main critiques :

- Relationship to the existing urban
- Applicability on the regional scale
- Encouraging privatisation and individual ownership



Broadacre City masterplan, Frank Lloyd Wright, 1935 , Source : www.moma.org



Extracted element : The grid , Drawn by author

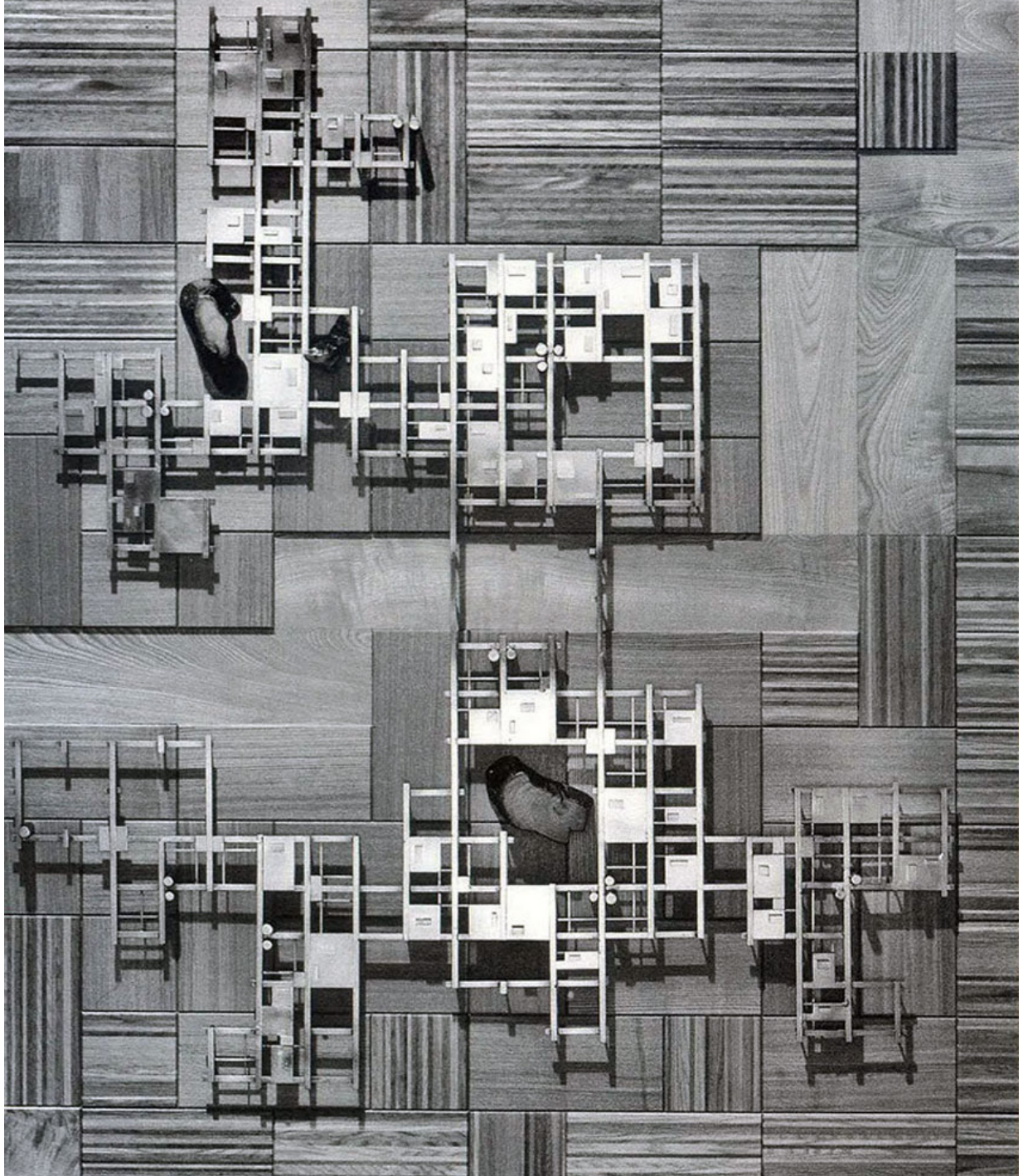


FIGURE : *Agricultural City* , Kisho Kurokawa , 1960 Source : <http://archeyes.com>

Agriculture city , Kisho Kurokawa

The core of Kurokawa's design for the agriculture city was to find a solution for the increasing flood risk in the town of Aichi after its destruction during the Ise Bay typhoon . The key aspect of the design therefore was to create a system of infrastructural grid that is raised above the ground leaving the land free for agriculture and flooding in the future . Taking a 500X500m grid as the basic unit of a community, Kurokawa proposed that roads, water , services, electricity , monorails and other facilities be installed 4meters above the ground . Each 500X500m block consists of twenty five 100X100m blocks to accommodate 200 people and acts as the basic unit of the proposed design. once two or more such units combine , they become a village .

While stressing on the more technical aspects of design, Kurokawa's approach is also able to create a design that effortlessly embodies both a sense of community and habitat. As imagined by Kurokawa, eventually the grid multiplies spontaneously , without any heirarchies to almost recreate a traditional Japanese rural village settlement.

Kurokawa believed that the increasing emphasis on designing 'cities' must be met with a counter narrative where urban design looks at rural communities as an extension of cities whose means of production is agriculture . His design emphasis on how each city type - rural, recreational, industrial, consumption) has a distinct urban system .

Thus, while the project emphasises on infrastructure as a basic framework for design, especially since the site was at an increased risk of flooding , the relationship with the land and the future vision for farming as the main mode of sustenance within the community is unclear. Considering that Japan is a country where most of the future urban growth will be restricted within 2-3 highly urbanised cities, vast expanse of rural land will be available for farming. In such a scenario the relevance of Kurokawa's project as a model for growth can be questionable.

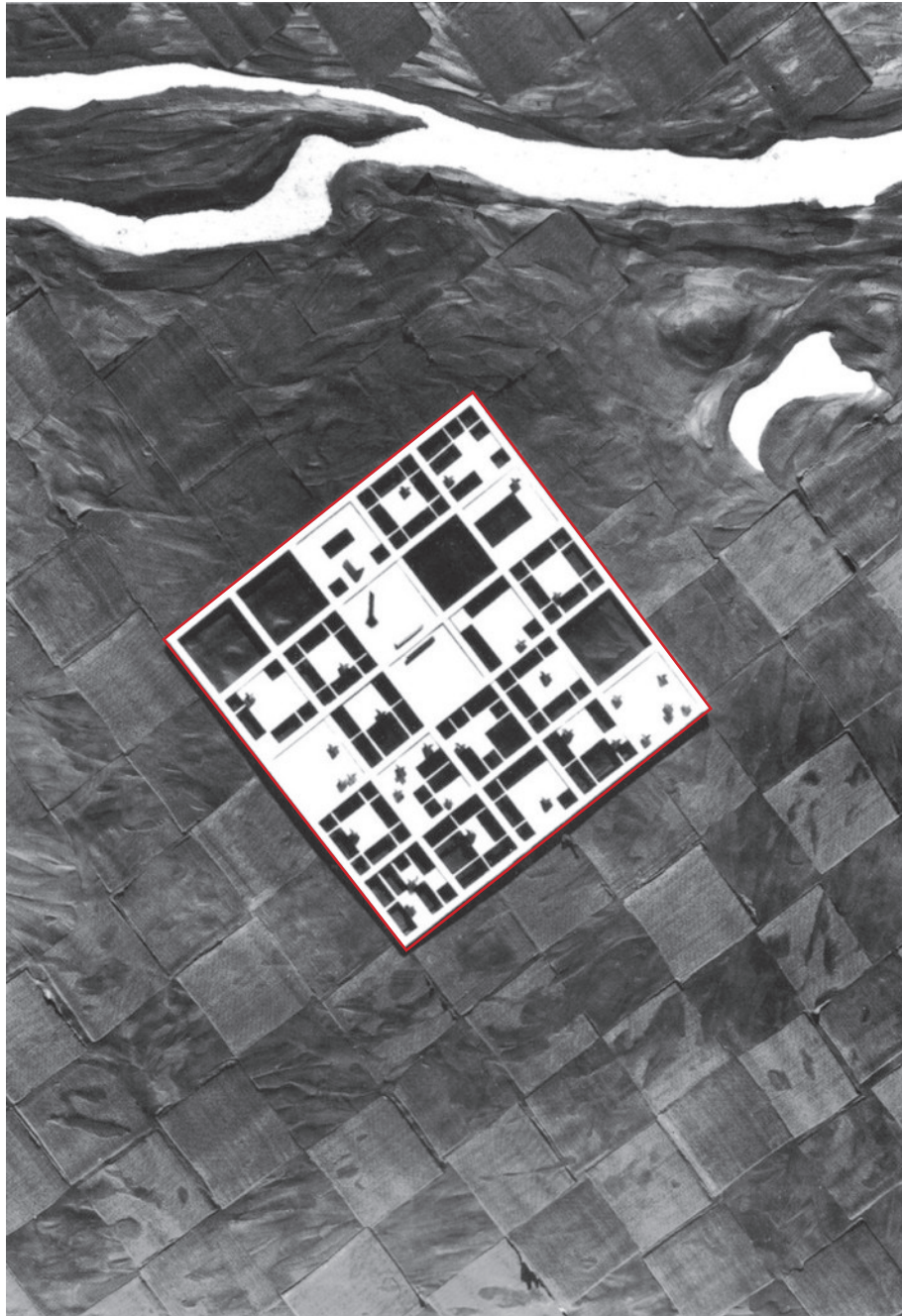
'The increasing emphasis on designing 'cities' must be met with a counter narrative where urban design looks at rural communities as an extension of cities whose means of production is agriculture .'

Relevant spatial strategies :

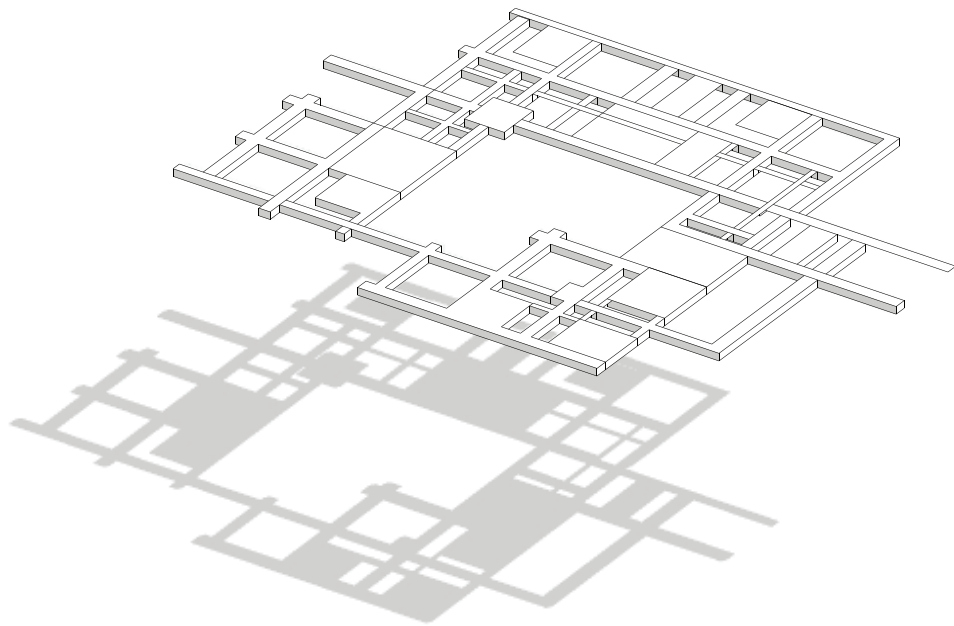
- Elevated infrastructure grid
- Smaller communal units as the single unit of design

Main critiques :

- Relationship with land



Agricultural City , Kisho Kurokawa , 1960 Source : <http://archeyes.com>



Extracted element : Elevated infrastructure grid , drawn by author

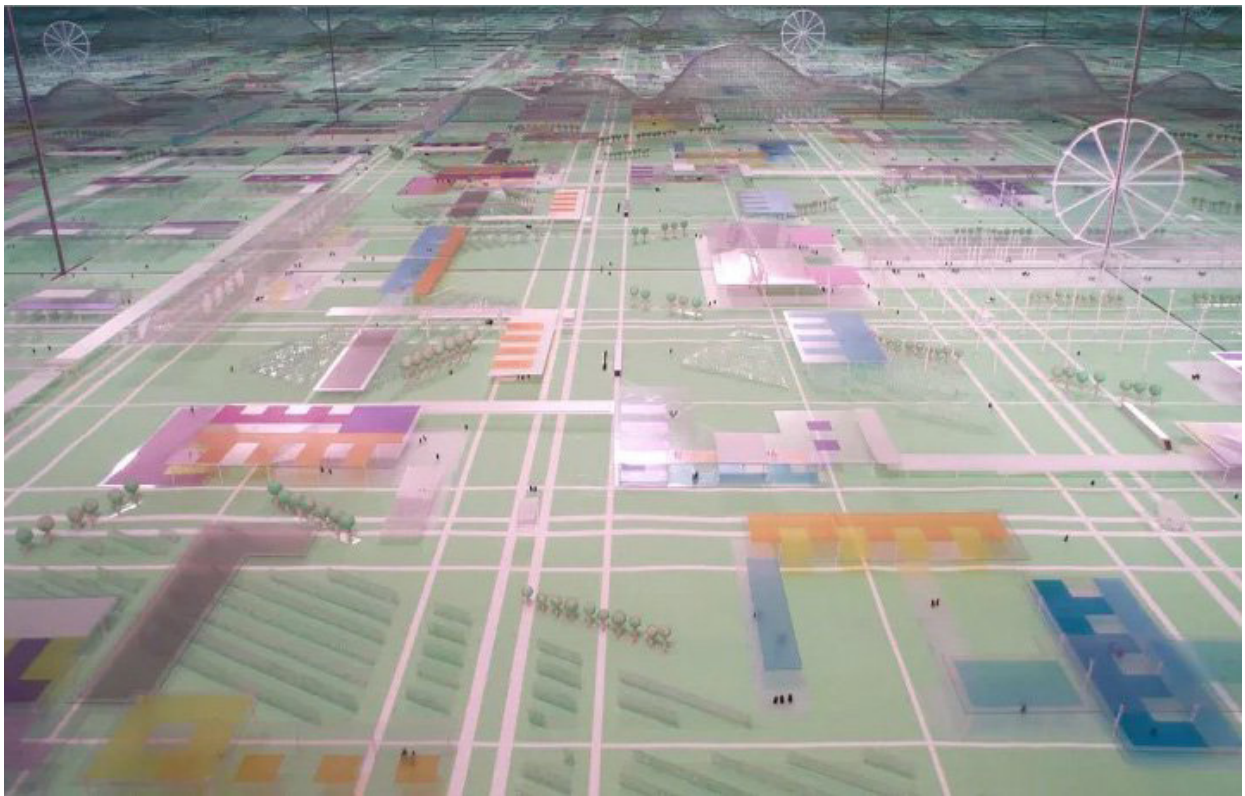


FIGURE 21 : *Agricultural City* , Kisho Kurokawa , 1960 , Source : Andrea Branzi, et. al

Agronica , Andrea Branzi

[While Wright's vision for a democratic model of urbanisation becomes an utopian concept in the present context, Branzi's Agronica on the other hand is more concerned with the delineation of power and the various flows that shape the city, necessitating its need to be more adaptive and less personalised. By embracing the perils of an industrial economy Branzi proposes a new model of weak urbanisation that allows the city to be mobile and open to change. Without fixing anything in time (and space) Branzi is able to acknowledge the temporality of the city while also questioning its need to be permanent and multilayered.

Commissioned by Philips Electronics the project tries to uncover the potential relationships between agricultural production and energy production. His fundamental aim is to create a territory for the new economy where agricultural production informs the urban form and direction of the cities growth. Such an approach to urban design has the potential to address the uncertainties and complexities that urbanists face within the context of ecological urbanism.

The project proposes an axis of services concentrated along the north-south railway line, that occasionally connects with systems of energy and urban infrastructure such as wind mills, research centres, theatres, parks etc. that are spread across the site. Such an arrangement offers both design flexibility and programmatic diversity. Although the main grid is not based on a fixed road network it overlays various systems of pedestrian, cycling and tram routes around which the various services are designed.

Without fixing anything in time (and space) Branzi is able to acknowledge the temporality of the city while also questioning its need to be permanent and multi-layered.

Relevant spatial strategies :

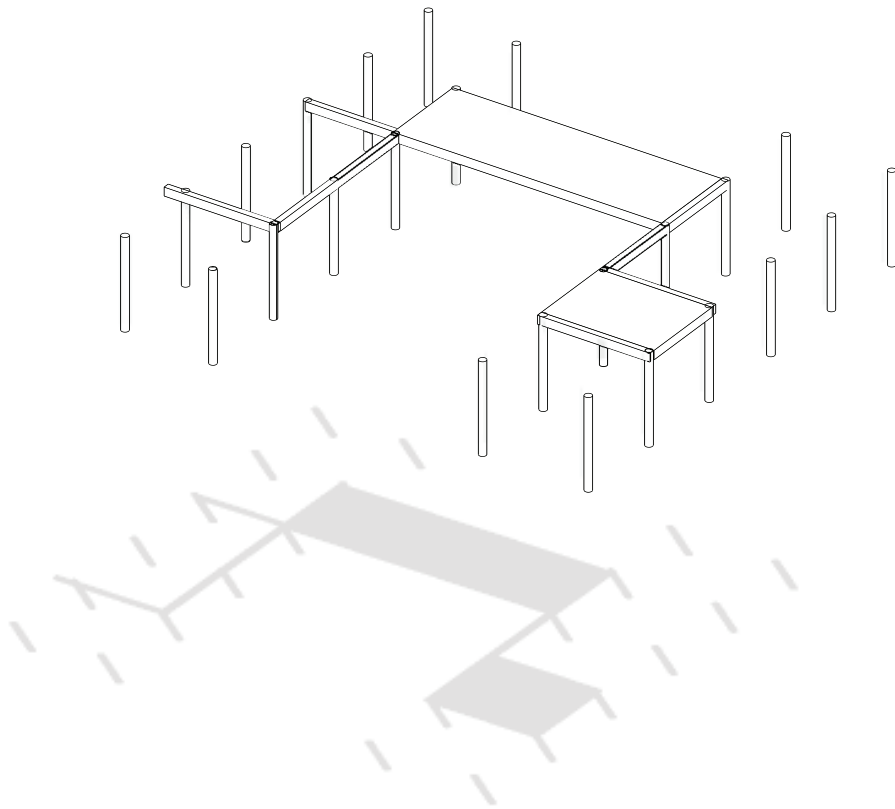
- Replicable model of growth
- Use of grid system to locate services
- Density variations and urban typologies

Main critiques :

- Lack of connectivity to the regional scale
- Relevance of human scale
- Absence of topographical variations



FIGURE 21 : *Agricultural City* , Kisho Kurokawa , 1960 Source : Andrea Branzi, et. al



Extracted element : Cylindrical pillars for both service and structural support
Drawn by author

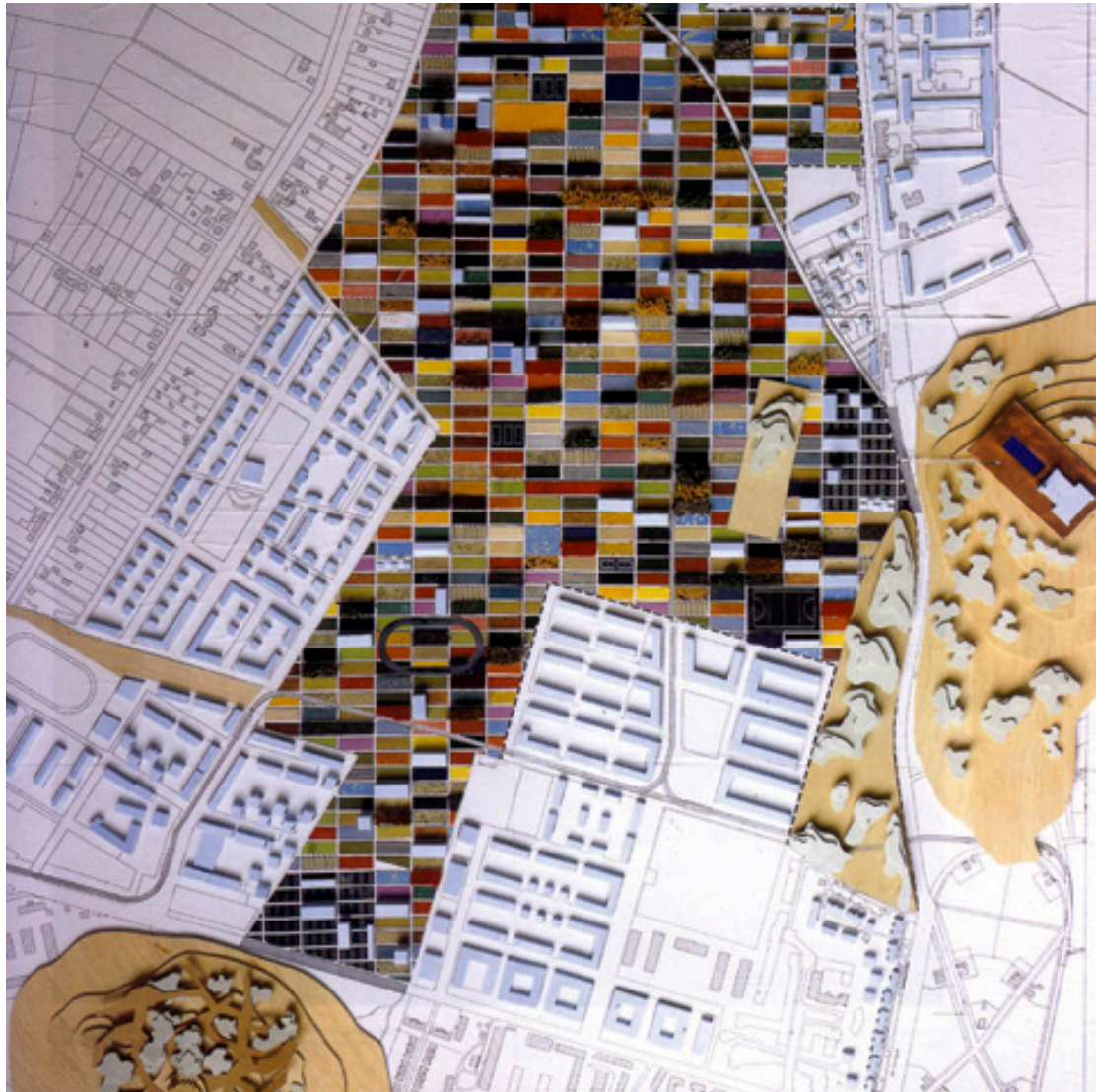


FIGURE : *Pixel City* MVRDV , Source : (Maas, Rijs and Koek, 1998)

Pixel City , Buga 2001, MVRDV

The project re-imagines the function of a public park especially in a context where individualization and digital media has taken over all forms of public functions. To answer this MVRDV approached the concept for a public park as a exhibition space which eventually evolves to become a public leisure zone or a new city district afterwards . To reach this goal the design was conceived first as a flexible exhibition park that was partitioned into blocks or gardens of 20X50m. The area of each plot was big enough to accommodate both a diverse range of plant species and public functions.

In order to avoid any preference all elements of the park were given the same plot type and the same amount of space. The idea was to make the plan flexible enough to eventually accommodate a whole host of different housing types : row house , villas, apartments, patio houses etc. The houses will eventually absorb or adopt the elements of the exhibition park to finally create a true garden city . The flexibility of the plot sizes also allows other kinds of public services and facilities to be accommodated . The project embraces diverse spaces and spatial qualities to such an extent that the distinction between the built and nonbuilt dissolves to become one uninterrupted pixel city.

Much like the Broadacre project , the plant city puts forward an idea for a new city where individual freedom and expression and crucial . But unlike Wright's approach this project focuses on individual expression through public functions and facilities . By proposing equal sized plots the project emphasis on the importance of sharing public resources but does make any clear hierarchies of ownership and livability.

‘The project embraces diverse spaces and spatial qualities to such an extent that the distinction between the built and nonbuilt dissolves to become one uninterrupted pixel city.’

Relevant spatial strategies :

- Equal sized typologies to provide equal access to public resources

Main critiques :

- Future ownership
- Infrastructure and access to the city

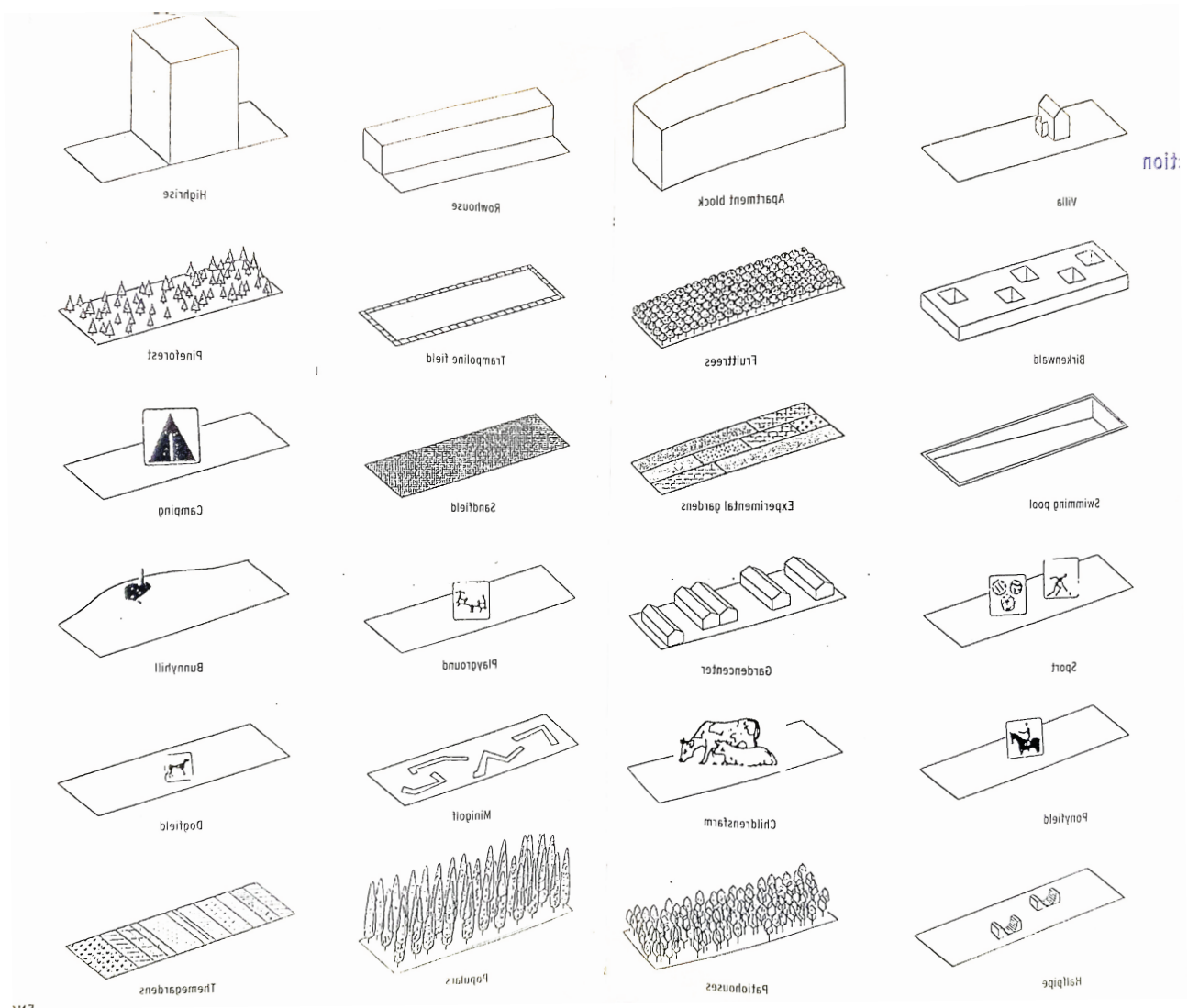
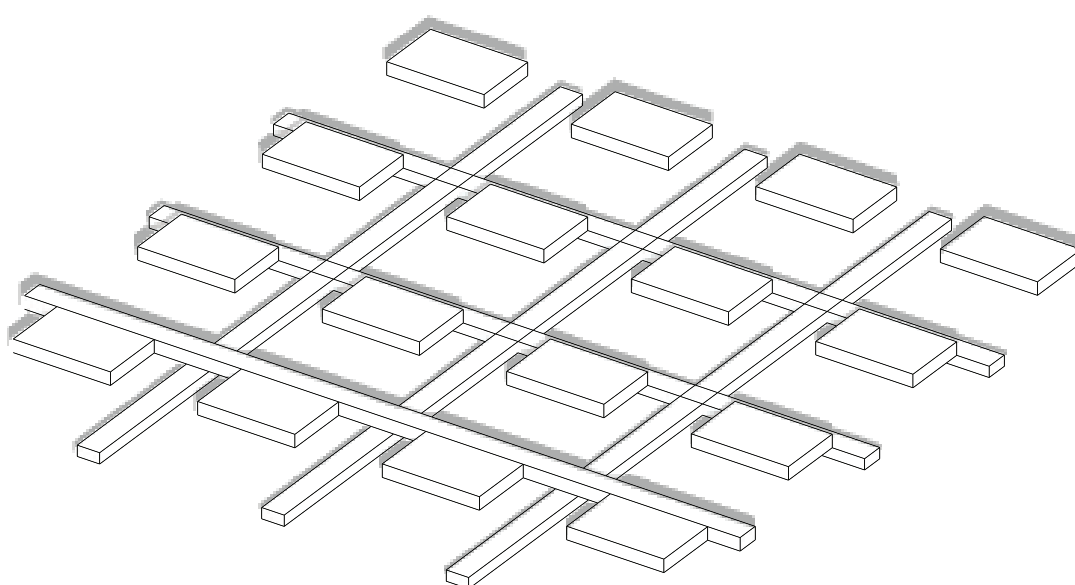


FIGURE : 20X50m typologies , *Pixel City MVRDV* , Source : (Maas, Rijs and Koek, 1998)



Extracted element :Equal sized urban typologies

Drawn by author

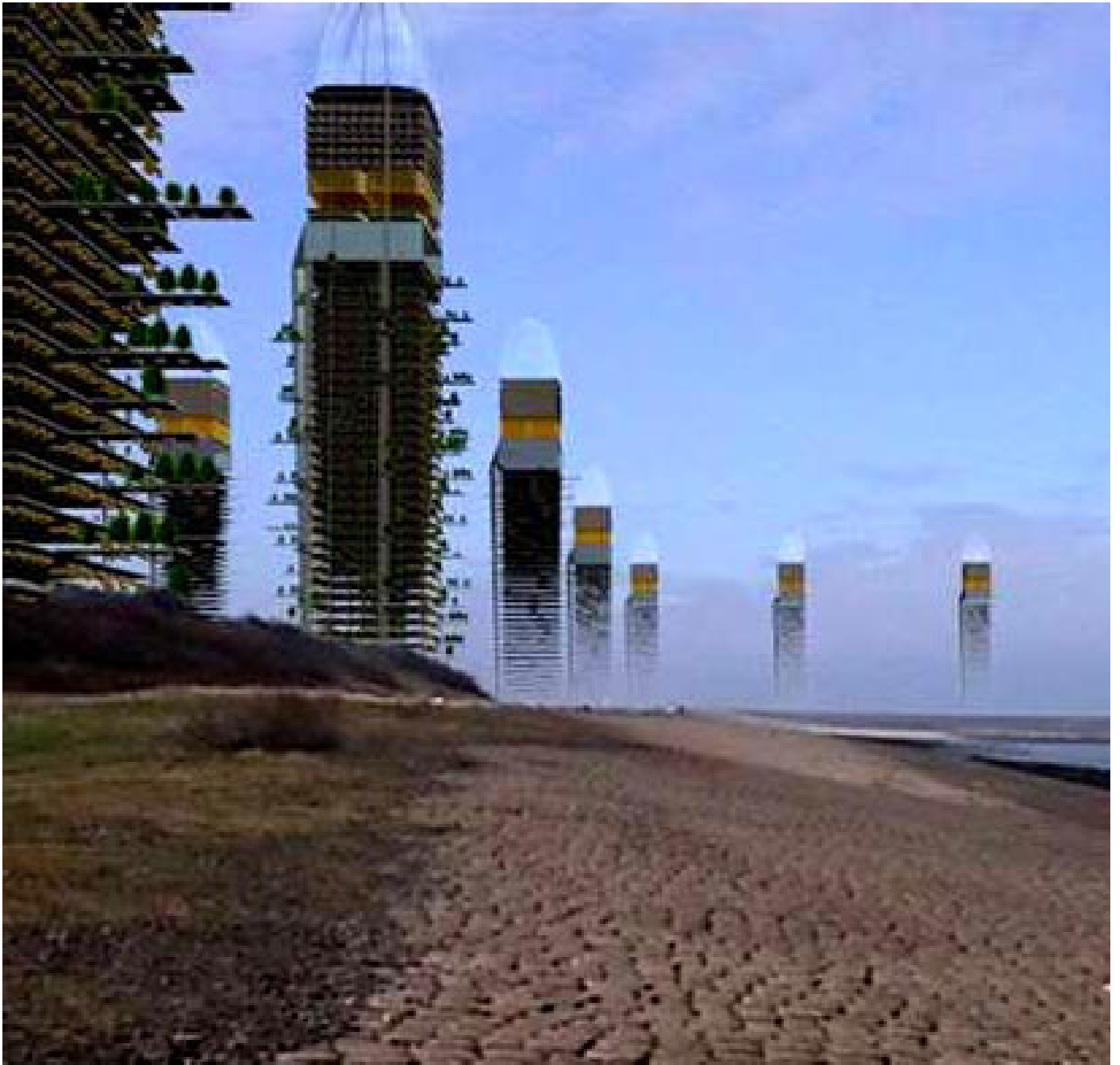


FIGURE : *Pig City*, MVRDV, Source : (Maas, Rijs and Koek, 2000)

Pig City , MVRDV

MVRDV's project on designing a city for pigs took density and consumption as the key elements as their focus of research and development of design. Considering the increasing pork consumption in the Netherlands , and the increasing dangers of the various livestock based diseases in this case swine flu , foot and mouth disease, the project questions the future of pork consumption and the pork industry in the Netherlands .

The project puts forward two extreme visions for the future one which looks at a change in patterns of consumption and the other that focuses on change in production methods. The result is a hybrid that tries to combine all the production activities involved in pig rearing and processing and transportation to concentrated high density fields towers . The project further proposes concepts such as a communal slaughter house, fertiliser recycling and a central food core, all of which focus on reducing the physical footprint of animal farms and also reduce the risk of diseases.

By tackling unsustainable production practices through density based strategies the project highlights how while the future of biobased farming cannot be imagined without animal based industries but it can focus on reducing footprint and using less ground space. On the contrary the project also shows how a complete transition towards bio based farming is an unviable option since it would require more land than is currently available within the Netherlands.

In comparison to Wrights vision for the rural city that deals with the social and political aspects of living and farming , MVRDV's approach to the future of food production and consumption is more advanced and direct . The project puts forward a bold vision where all non- land based farming practices will be incorporated into higher densities and function using technology.

'The project puts forward two extreme visions for the future one which looks at a change in patterns of consumption and the other that focuses on change in production methods. The result is a hybrid that tries to concentrate all the production activities within high density farming towers .'

Relevant spatial strategies :

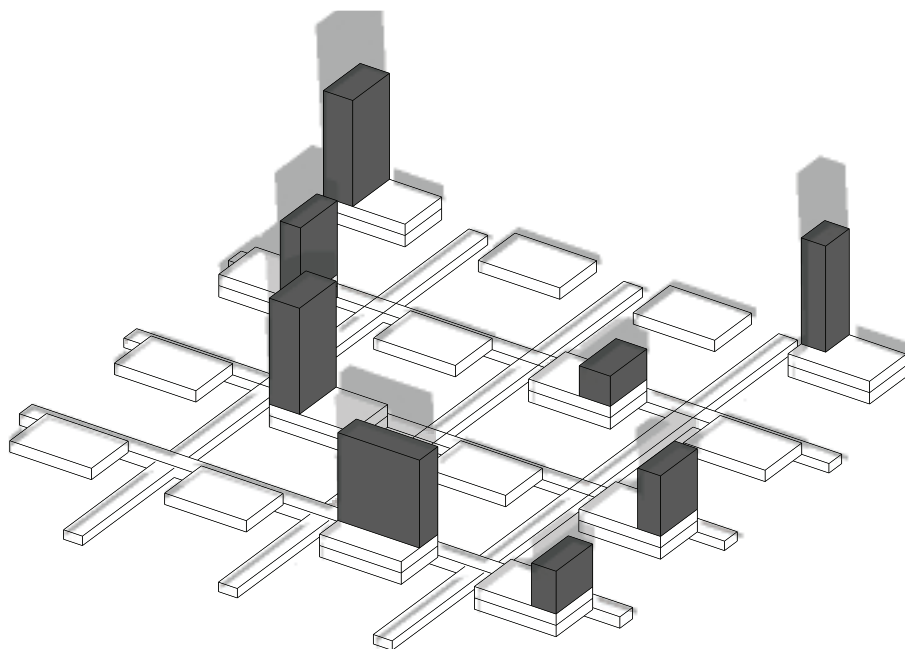
- Density as a strategy to reduce footprint
- Emphasis on communal services and infrastructure

Main critiques :

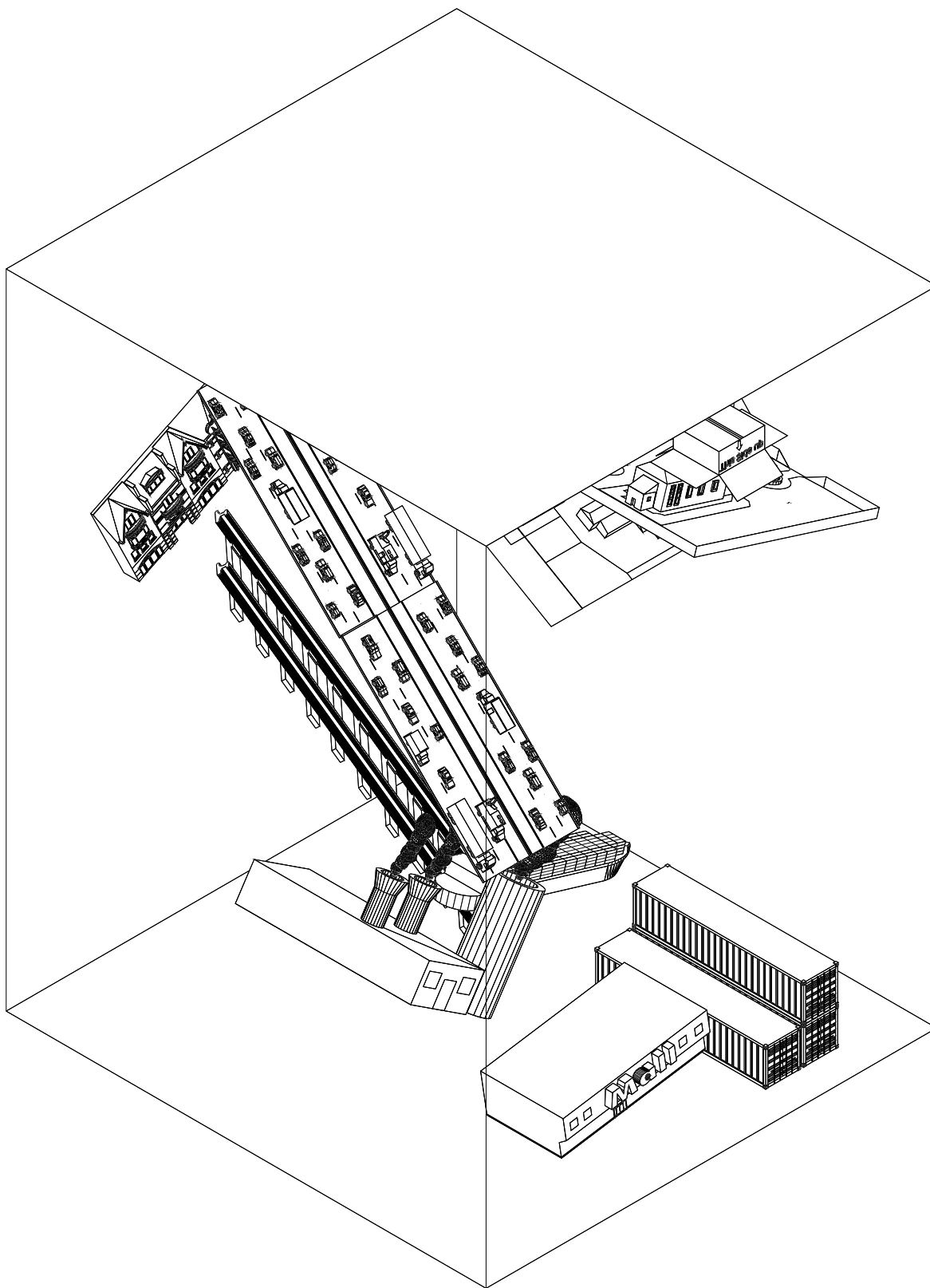
- Relationship to the existing urban
- Relationship with the newly available land



FIGURE : Image of the farming tower , Pig City, MVRDV , Source : (*Maas, Rijs and Koek, 2000*)

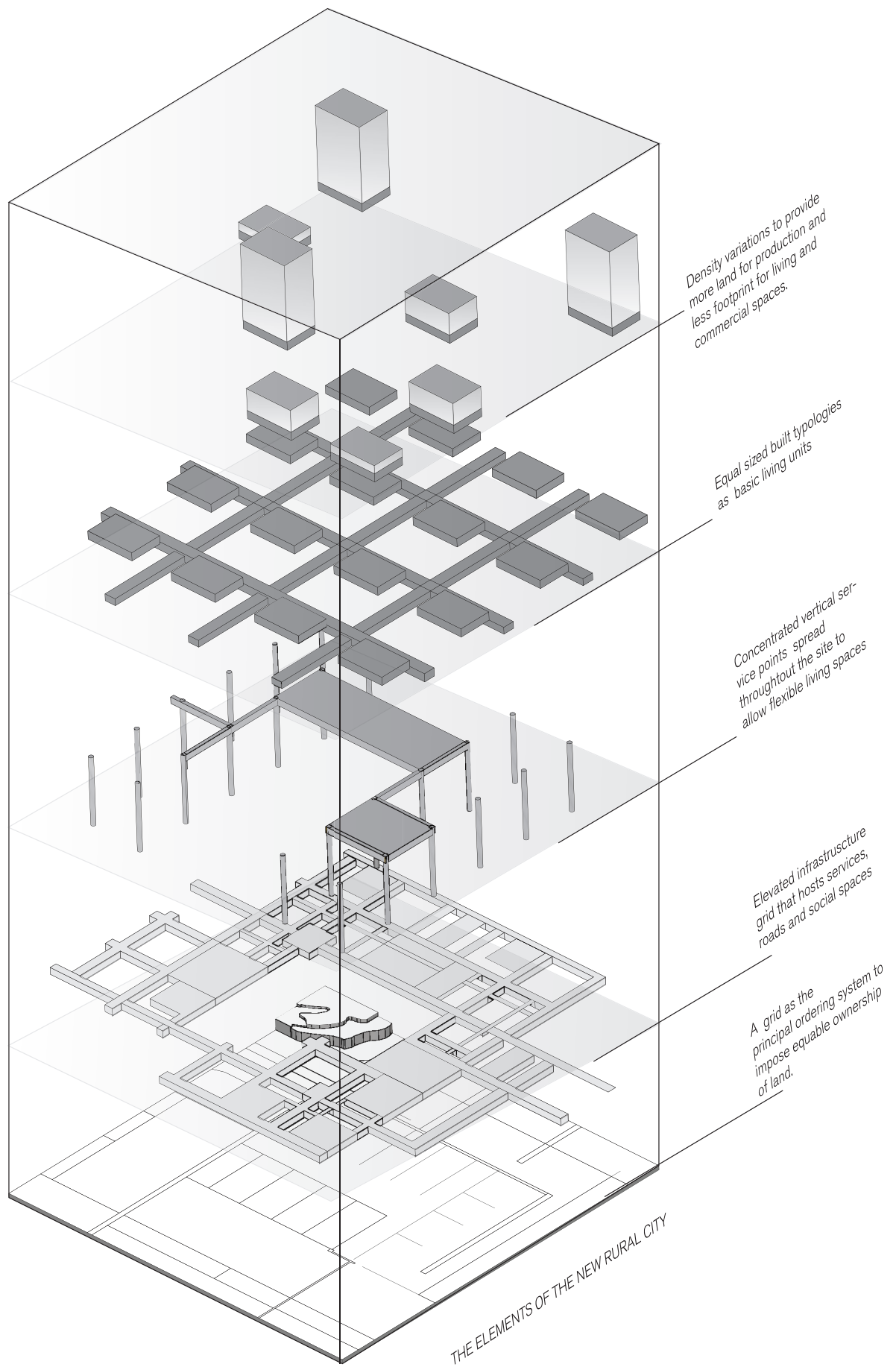


Extracted element : Density as a tool to create different open-built ratios
Drawn by author



The elements of the industrial city , drawn by author

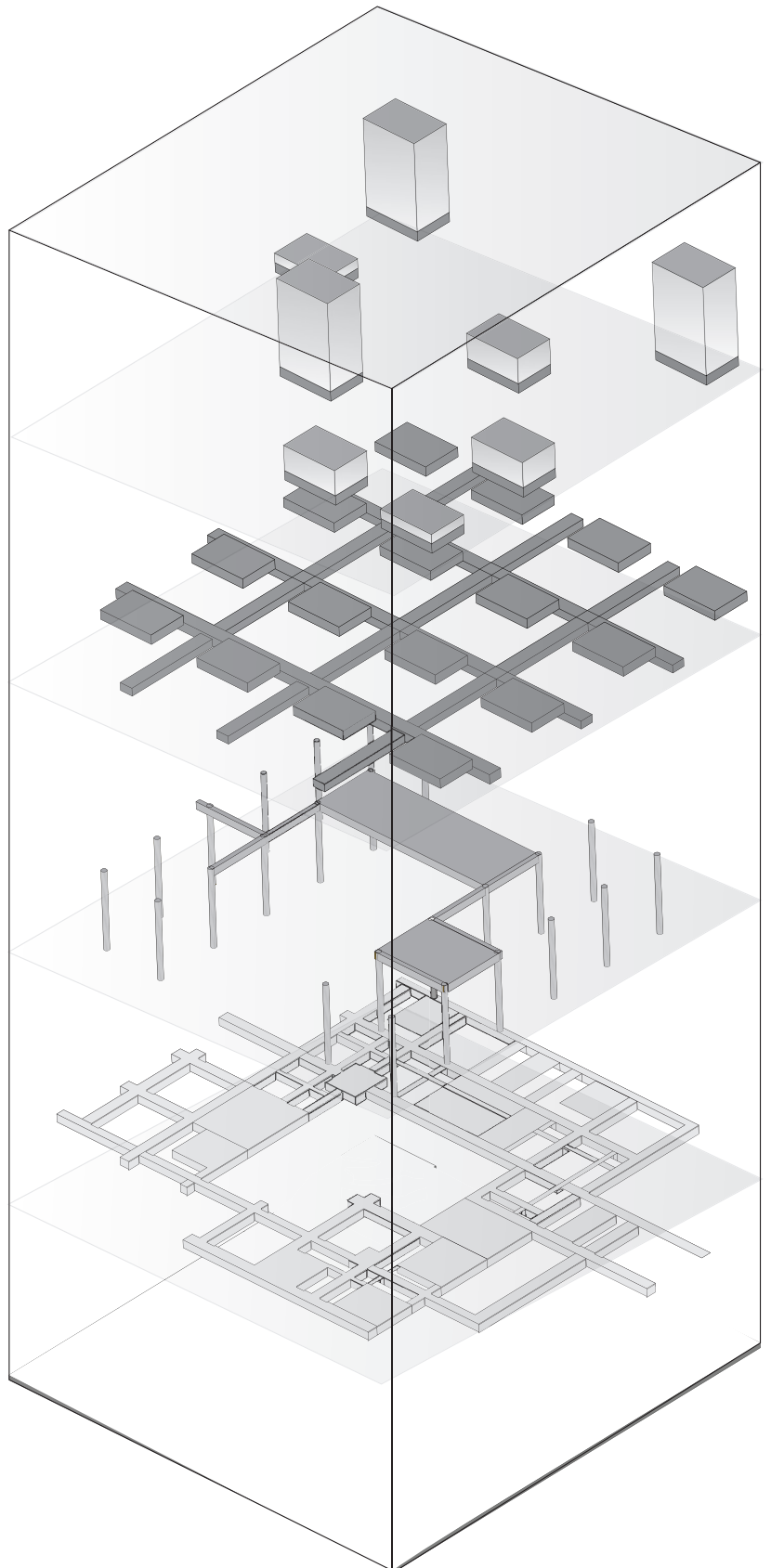
Drawn by author



The proposed land order of the new rural city
 Drawn by author

III / 04.

The new city manifesto



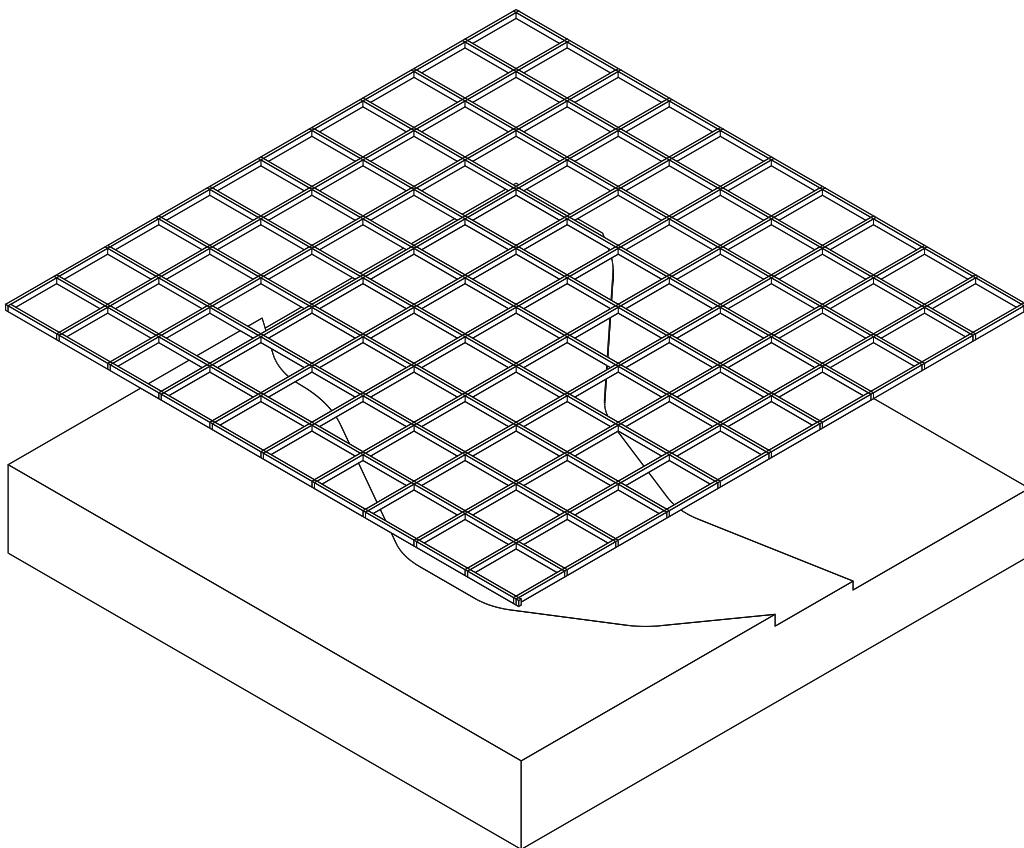
The proposed land order of the new rural city

Drawn by author

01. De- privatising agricultural land

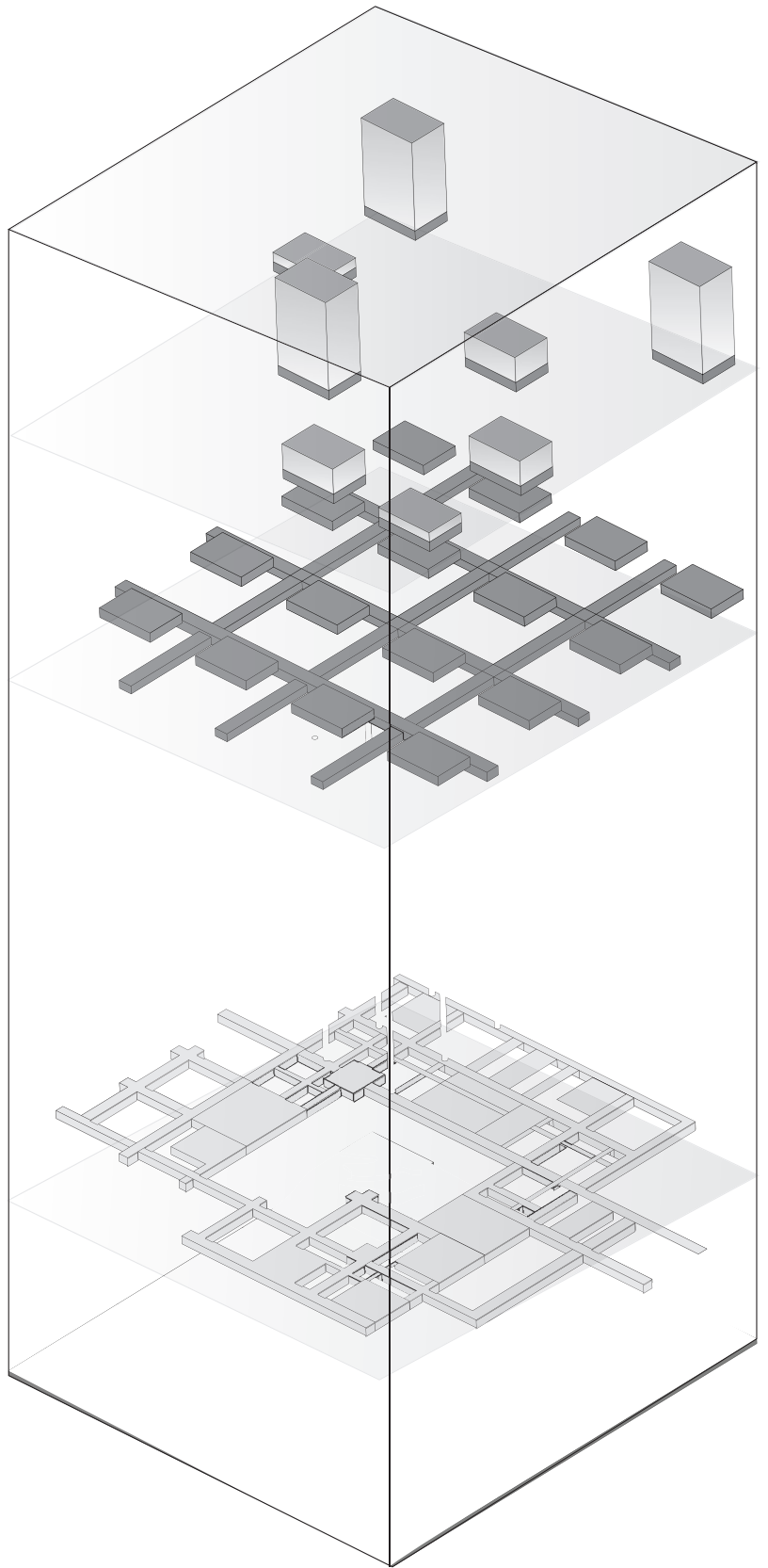
Procuring, reappropriating and redistributing large private farm holdings

Since the industrial city forced the enclosure of rural land property in favour of large scale factories and industries that fed its new global economy, the rural has now been reduced to a homogeneous mixture of large individually owned farms interspersed with commercial and industrial typologies. Thus, revitalising the rural as a means of achieving food sufficiency would require both diversity of ownership as well as an efficient recalibration of the existing rural fabric.



Superimposing a 1 hectare grid to create a new land order

Drawn by author



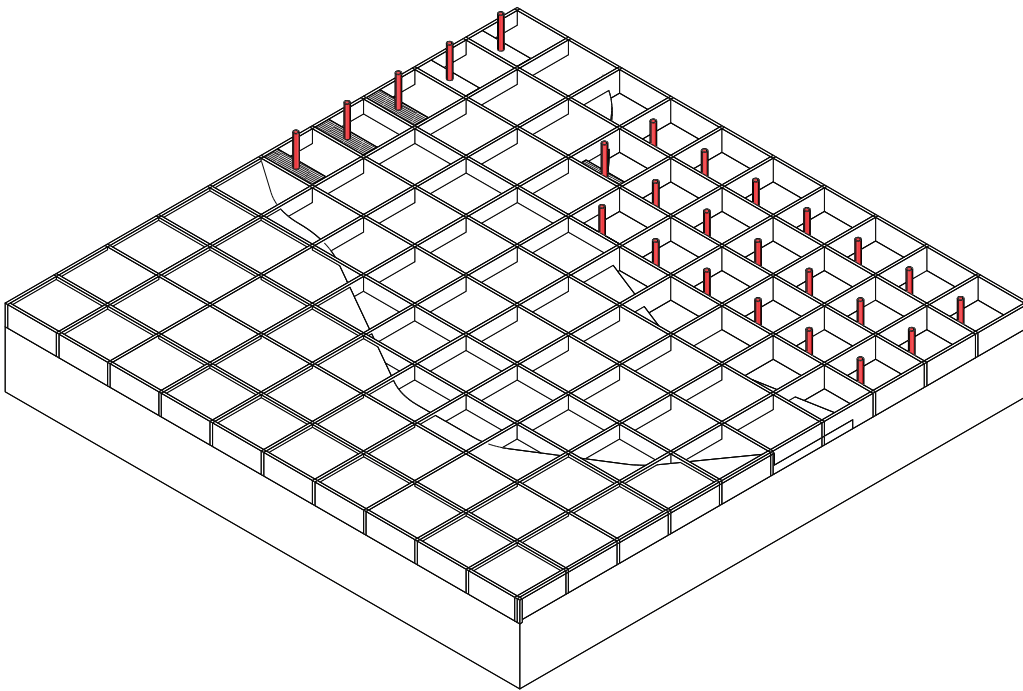
The proposed land order of the new rural city

Drawn by author

02.Repurposing low yield land and introducing incentives

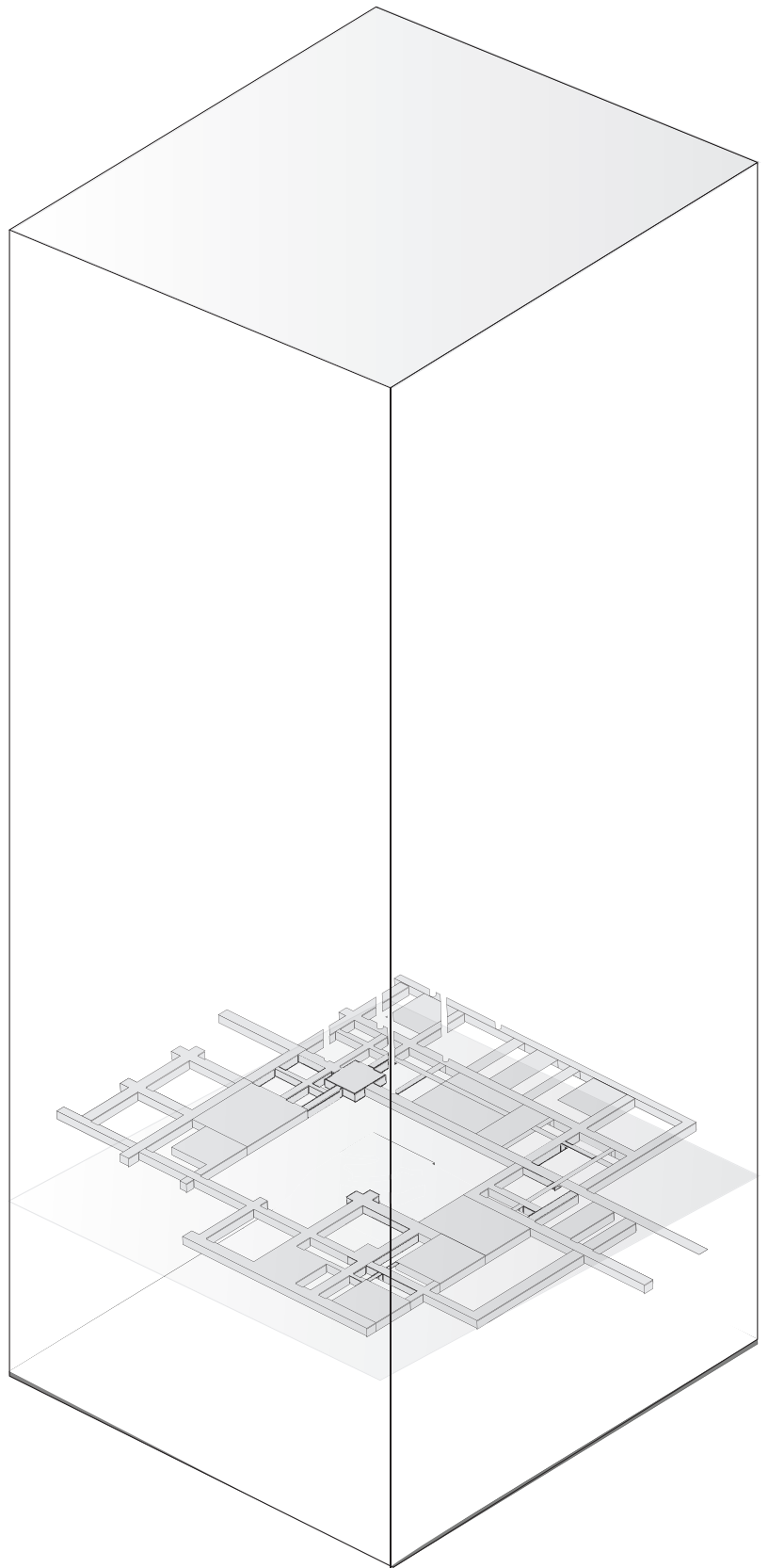
Commercial re-purposing of low yielding agriculture land to introduce new farming typologies

The gradual decline of the domestic agriculture industry that came as a result of the decline of the rural, forced the re-purposing of productive land either for large scale grazing or industries. Over the years these practices have adversely affected the productive value of the land and also encouraged unsustainable farming practices. The redesign of the rural therefore must include strategies for underutilised land (such as - grazing land, land prone to flooding, brownfields) by introducing incentives for its repurposing for public or productive landuses.



Introducing the plinth and the service core on site

Drawn by author



The proposed land order of the new rural city

Drawn by author

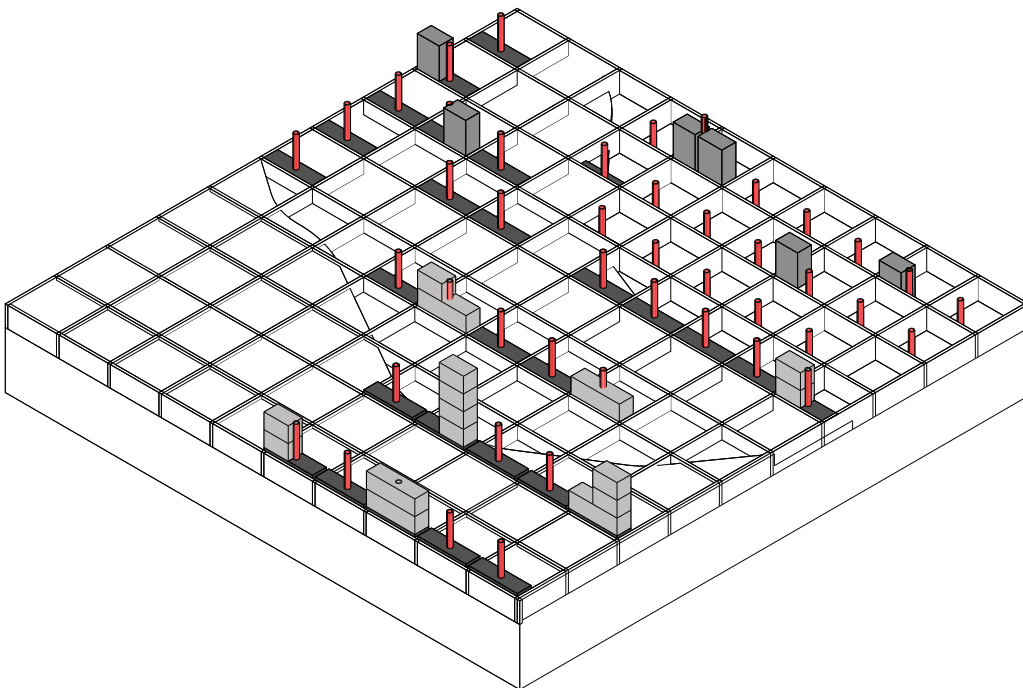
03. New rural housing projects : densities and footprint

Shifting from FAR based to yield based densities for the development of a systematic rural sprawl.

Since the decline of the industrial city opened up avenues for new forms of urban speculations the density of the city has been largely defined and regulated based on market forces. This has led to uncontrolled encroachment of the largely privatised rural and has affected the quantity as well as quality of agricultural yields over the years. Rural densities therefore must adhere to certain performative factors of the land such as - yield, soil quality, sub-surface quality etc so as to ensure the development of a systematic sprawl effective utilisation of the available productive land.

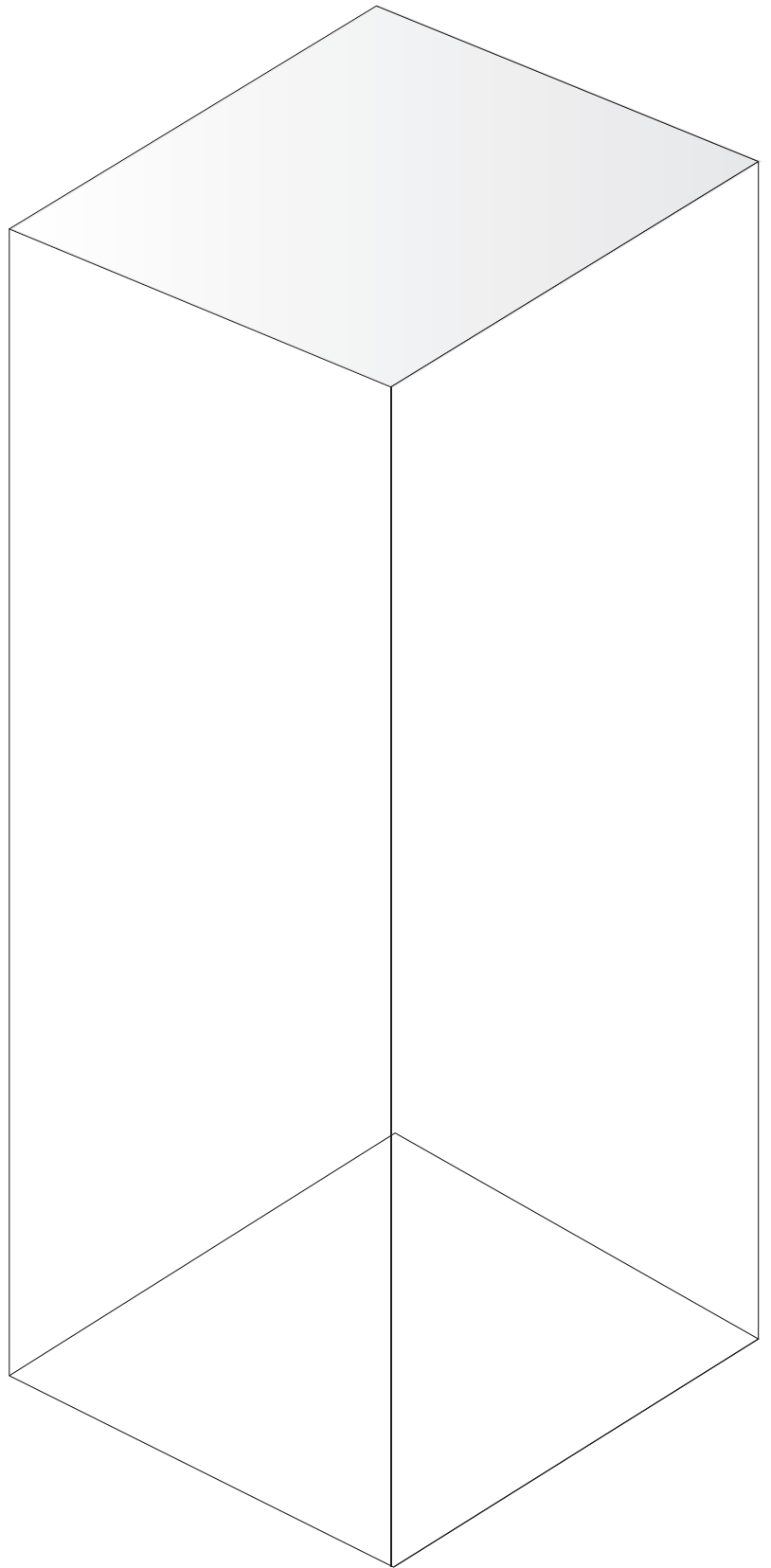
Encouraging sustainable consumption by reducing the footprint of animal based farms.

Since industrialisation provided the technology for mass production several large farms shifted towards the more profitable animal based farming. This mass production of meat and dairy has grossly altered the patterns of consumption and has also adversely effected the quantity of available land and resources since huge amounts are needed to feed the cattle and livestock. The reappropriation of the rural must therefore focus on strategies and policies to mitigate the use of productive land for the purpose of animal based farming



Fixing the maximum densities based on proposed landuses

Drawn by author

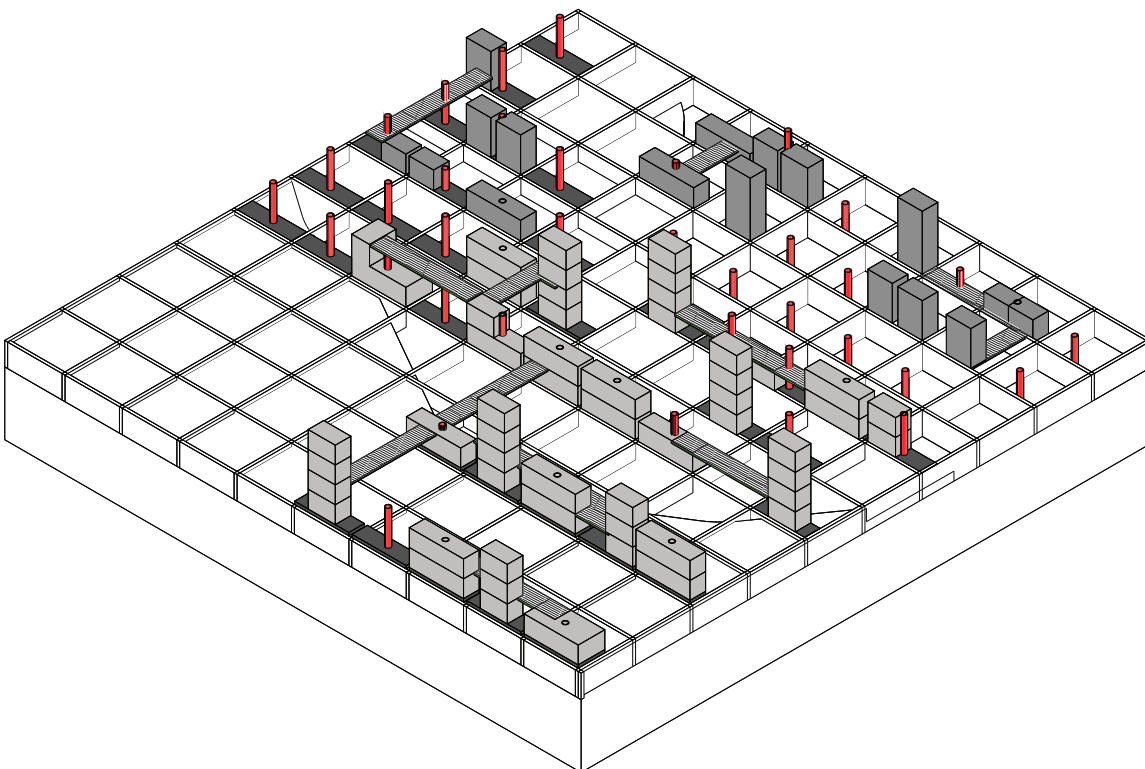


The proposed land order of the new rural city

Drawn by author

04 . Promoting occupational diversity within the rural economy by incorporating a variety of landuses.

The creation of a homogenous sprawl of various forms of productive urban typologies eg: factories, industries, mills, not only led to the devaluation of productive land but also exposed the vulnerability of an agrarian economy in the era of globalised food production. Rural urbanisation therefore must need to focus exclusively on creating occupational diversity and extreme mixes of programme not only for the economic resilience of the rural community but also to respond to the values of publicness and communal identity.

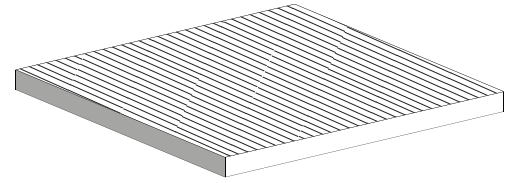


Creating a new level that hosts social and commercial spaces and also facilitates sharing of services

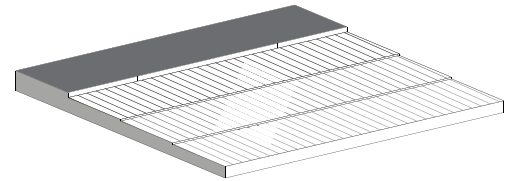
Drawn by author

IV

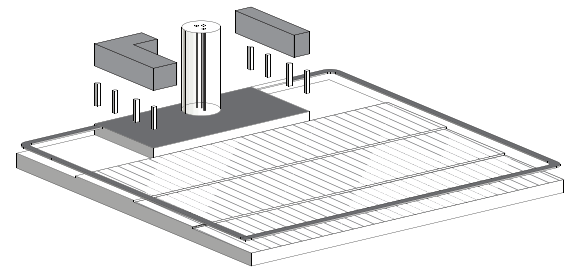
[*The design*]



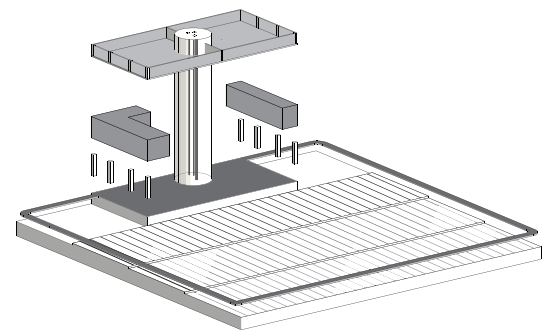
1 hectare plot



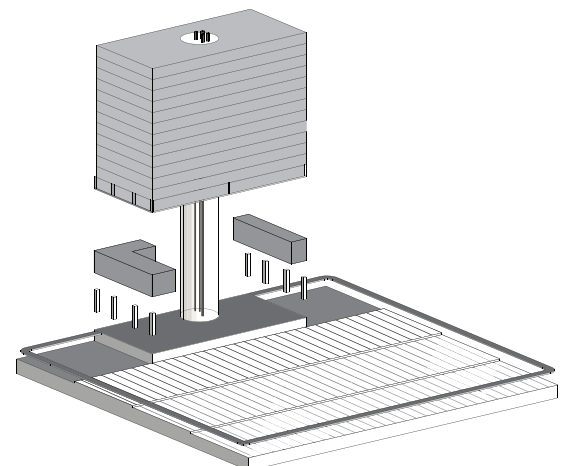
Plot divisions and plinth



Adding service and structural cores



Introducing housing units



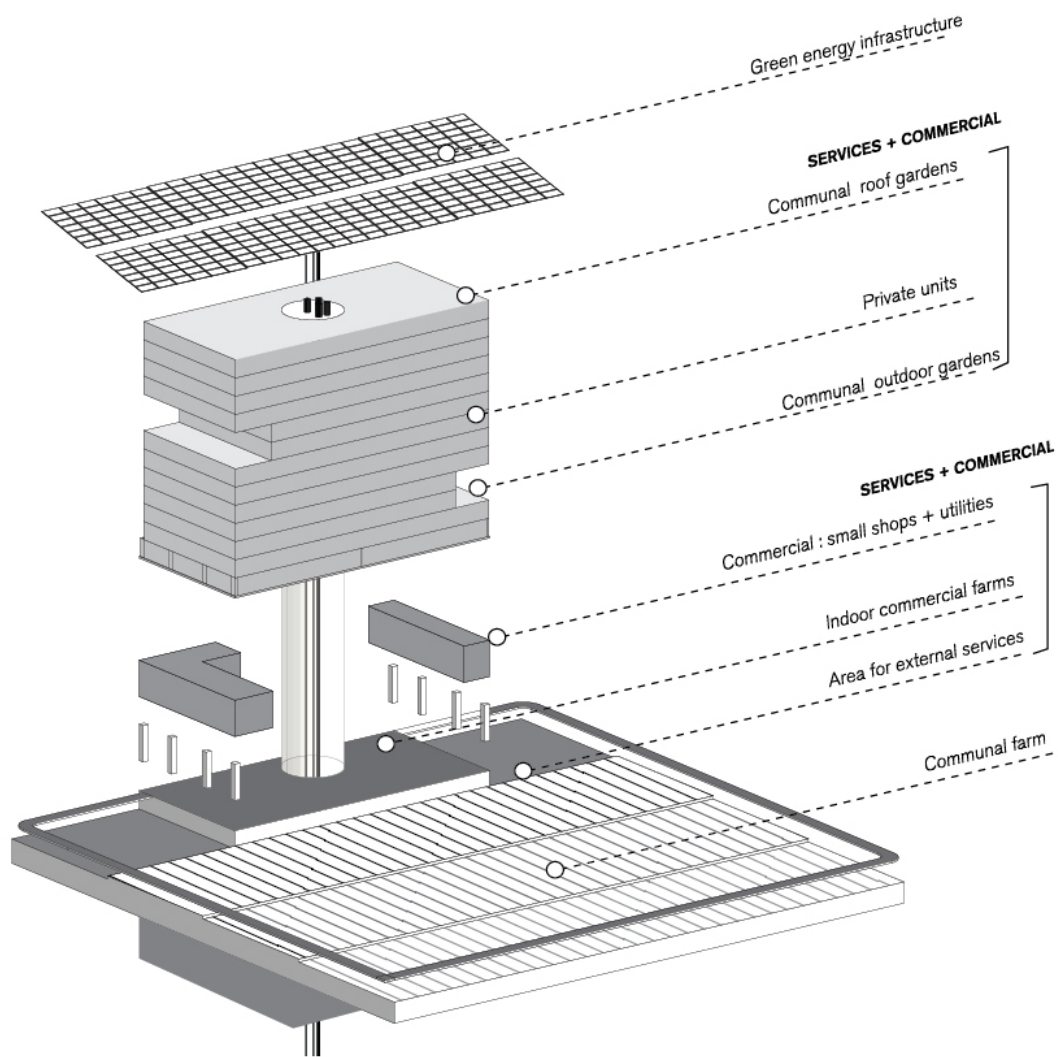
Achieving maximum density

DESIGN PART I

Spatial Components : Making the rural typologies

To impose new forms of communal ownership and limit the commercialisation of food production each 1 hectare plot is further subdivided to ensure through design clear lines of separation between production , industry, labour and function. Broadly the 1 hectare typologies are of three types : 1).Community farms and housing , 2). Community farms and service and or commercial industry and 3). Community / Public farms and institutional, cultural or public functions.

Typology 01 : Community farms + Housing

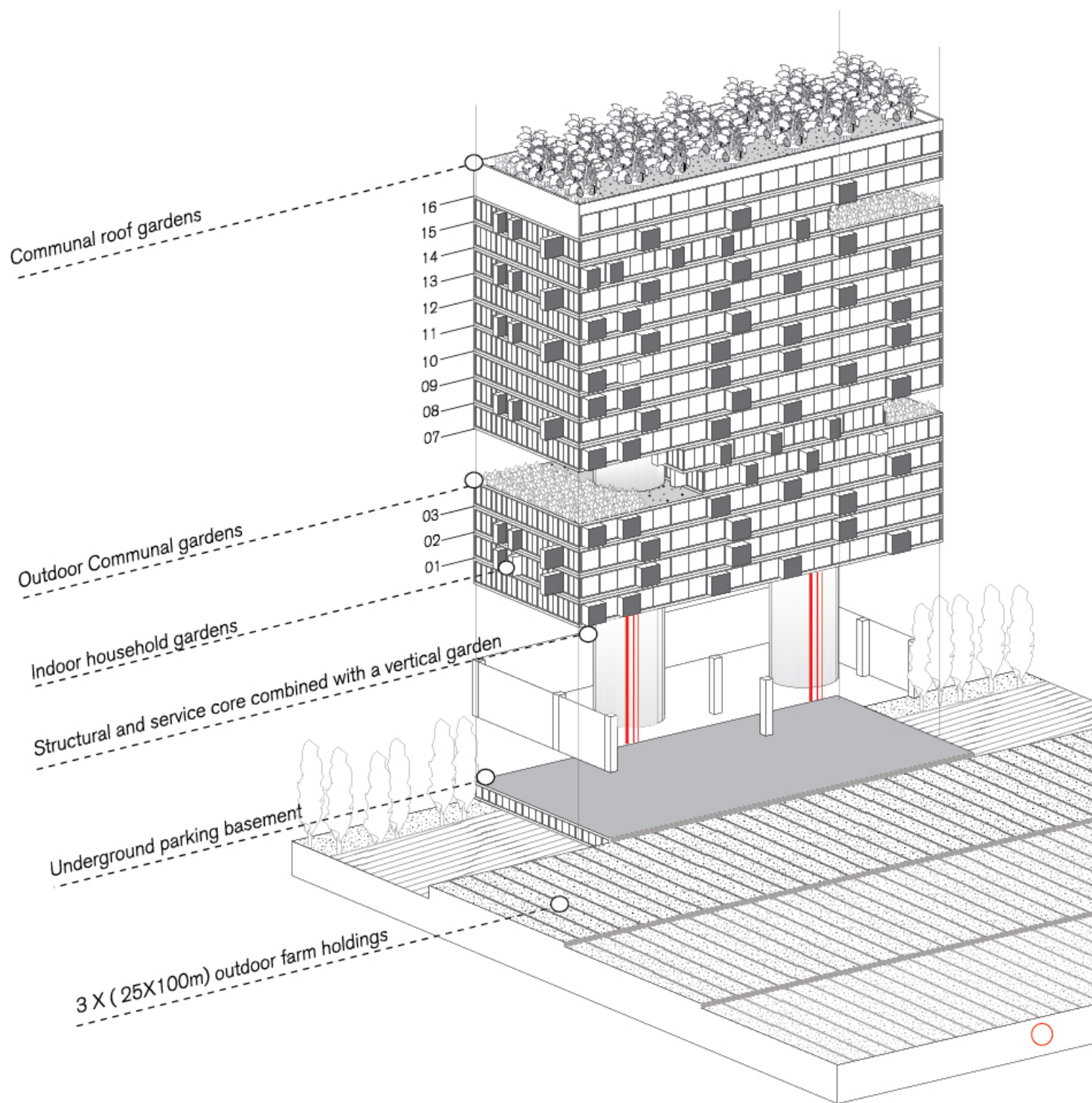


Drawn by author

TPOLOGY 01 OVERVIEW

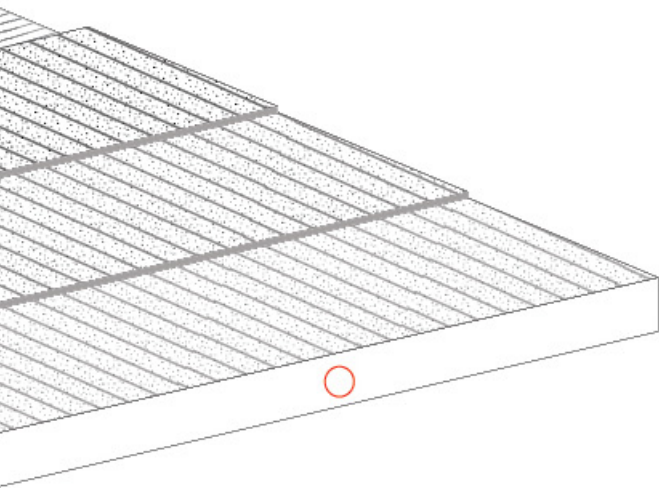
01 . Crop types :

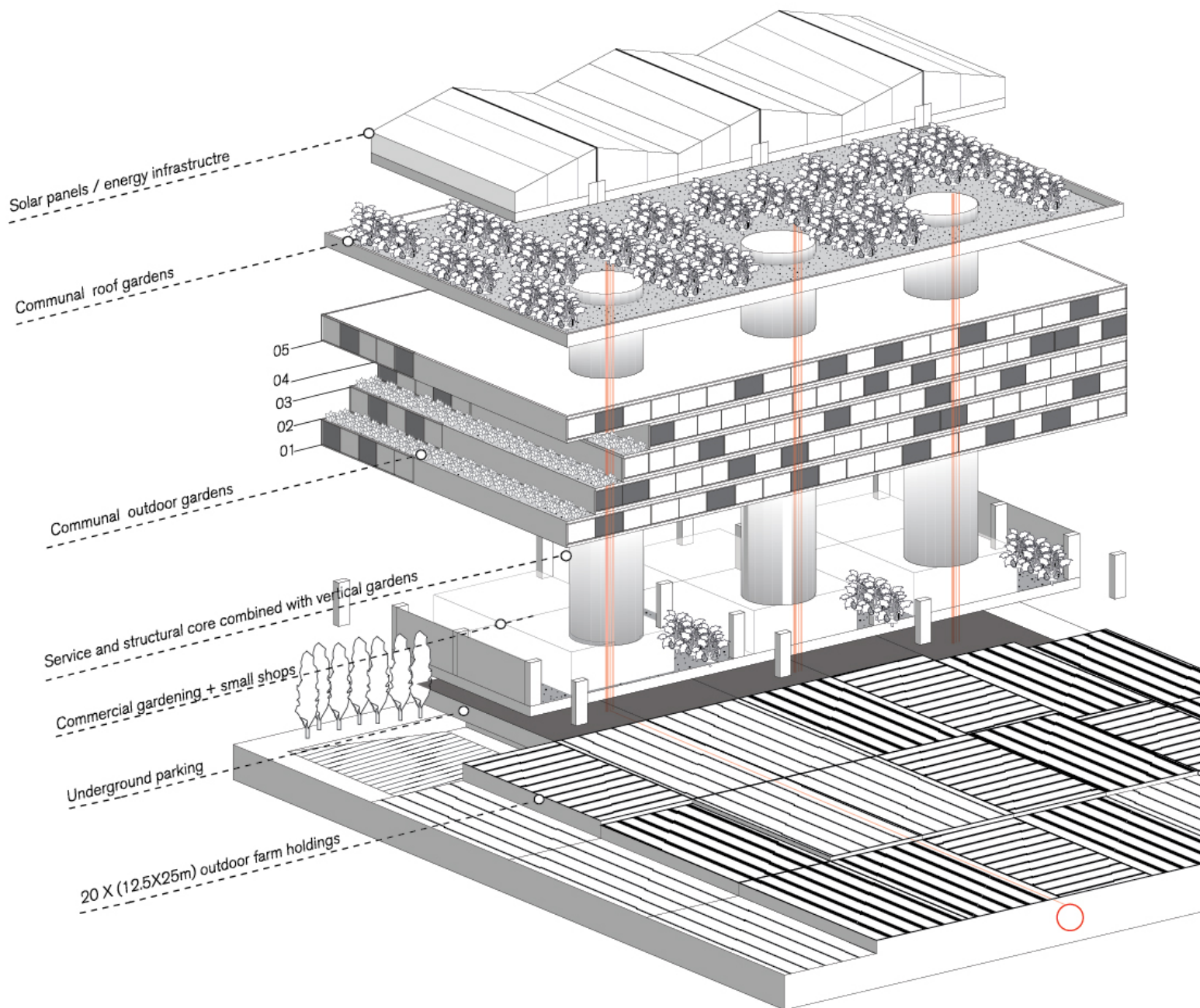
Cereal crops , general crops , horticulture crops
cereals, oats , barley, green
vegetables , herbs



Communal farm - TYPE 01 : Cereal crop

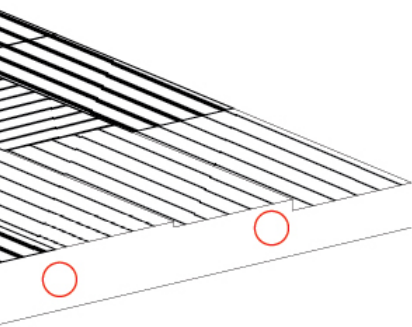
FAR 2, 16 Floors , 0.25 Ha coverage

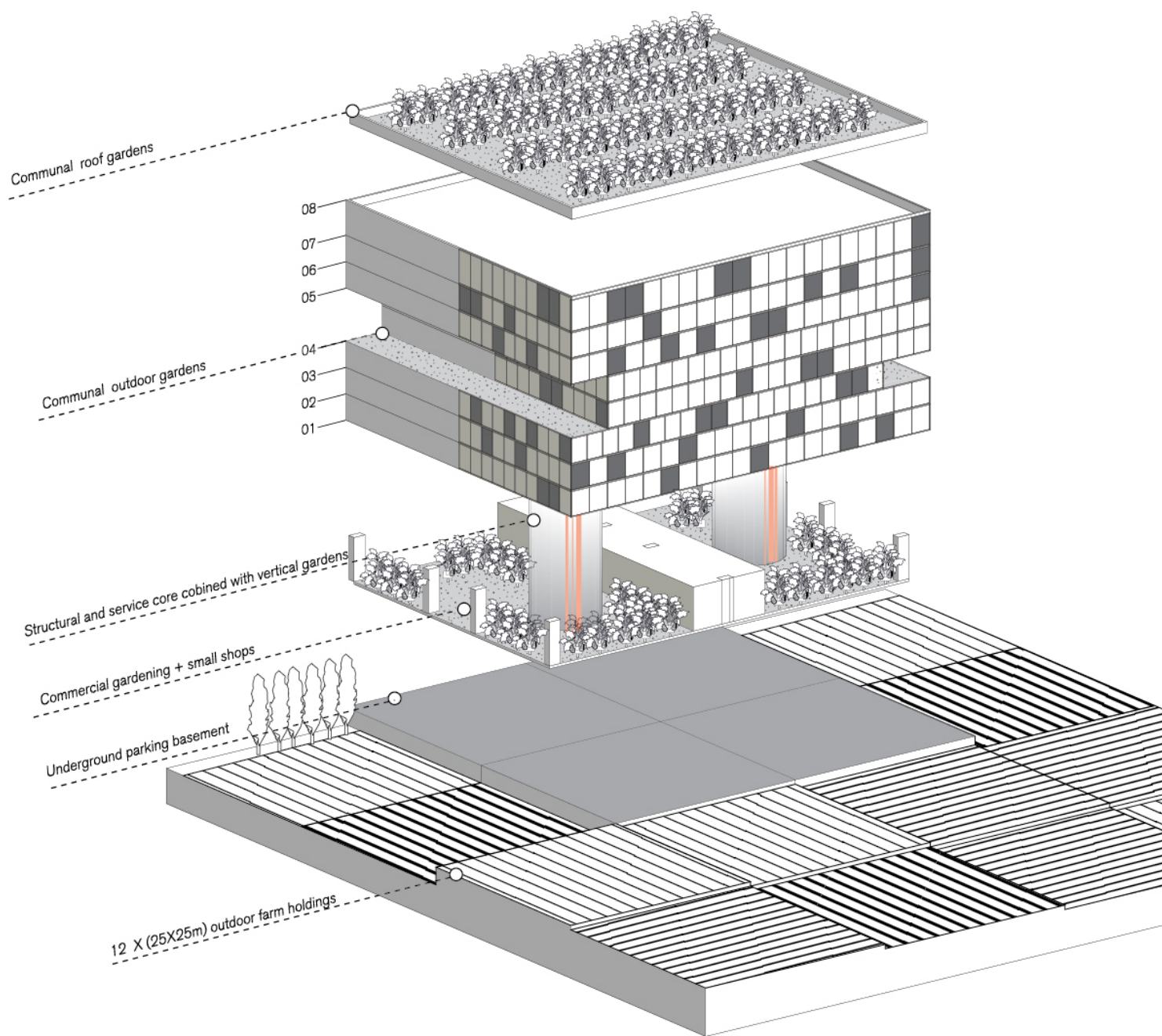




Communal farm - TYPE 02 : General crops

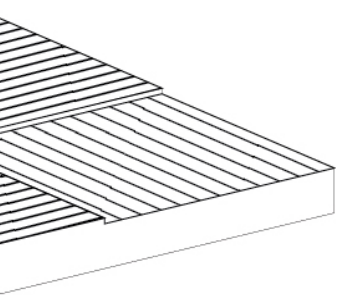
FAR : 2, 5 Floors , 0.5 Ha coverage

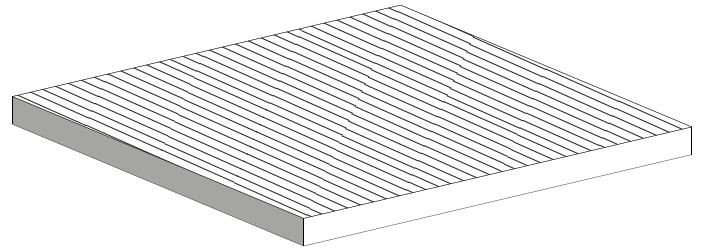




Communal farm - Horticulture crops

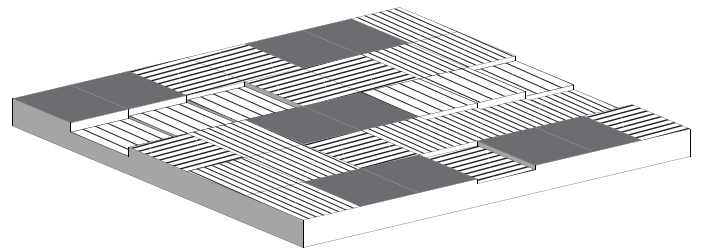
FAR: 2 , 8 Floors , 0.5 Ha coverage



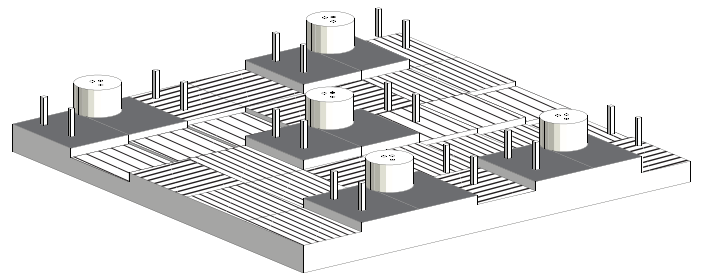


1 hectare plot

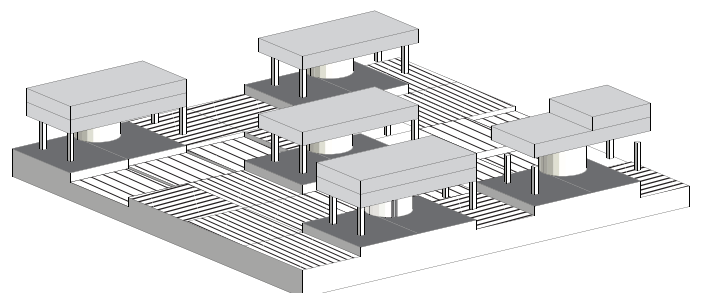
Typology 02 : Service + commercial farms



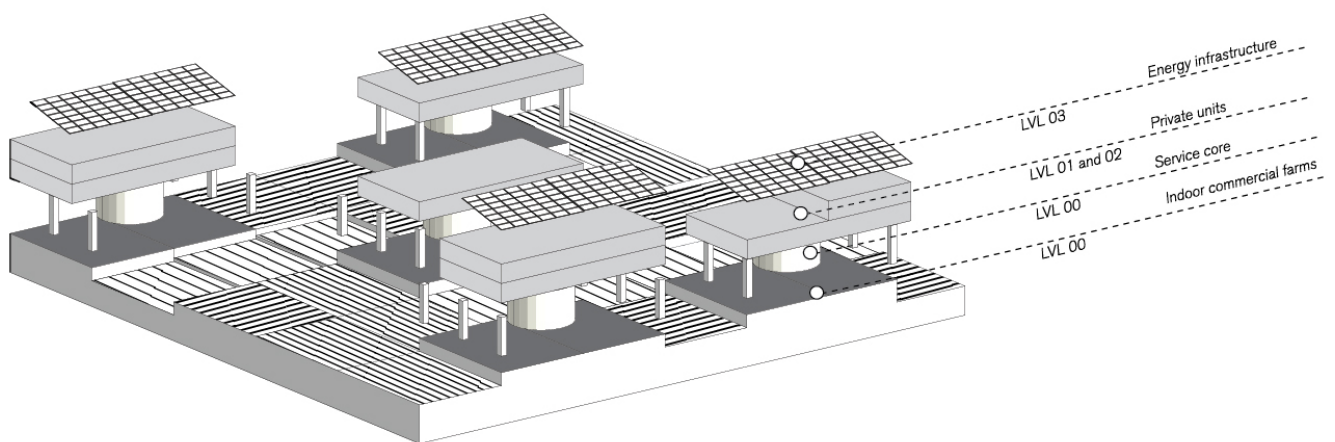
Plot divisions and plinth



Adding service and structural cores

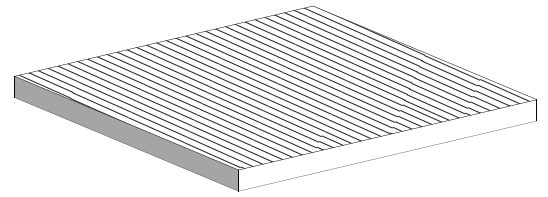


Introducing housing units

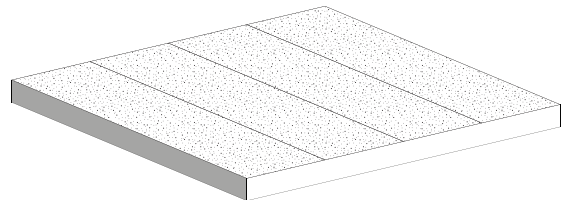


Typology 02 : Service + commercial farms

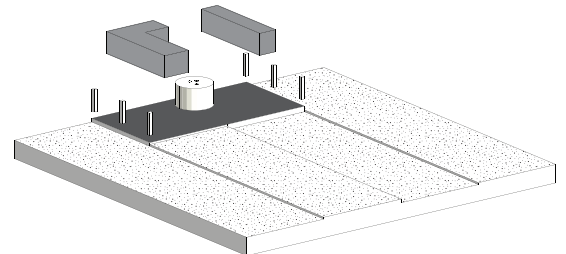
Any animal based farm , 12-36 commercial unit , 0.5Ha Coverage



1 hectare plot

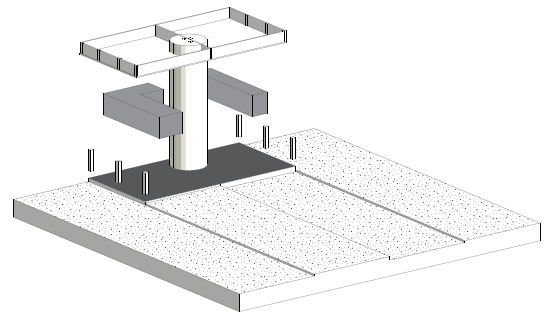


Plot divisions and plinth

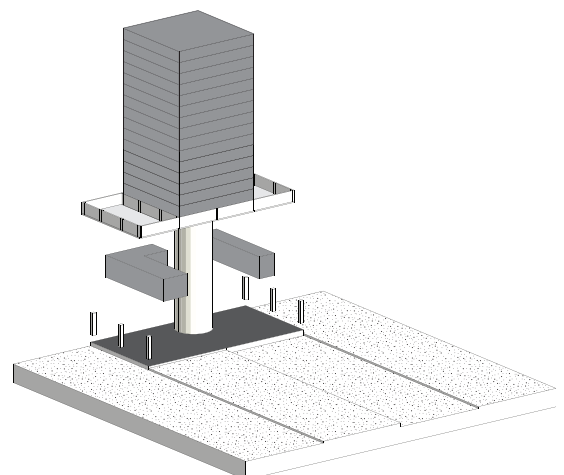


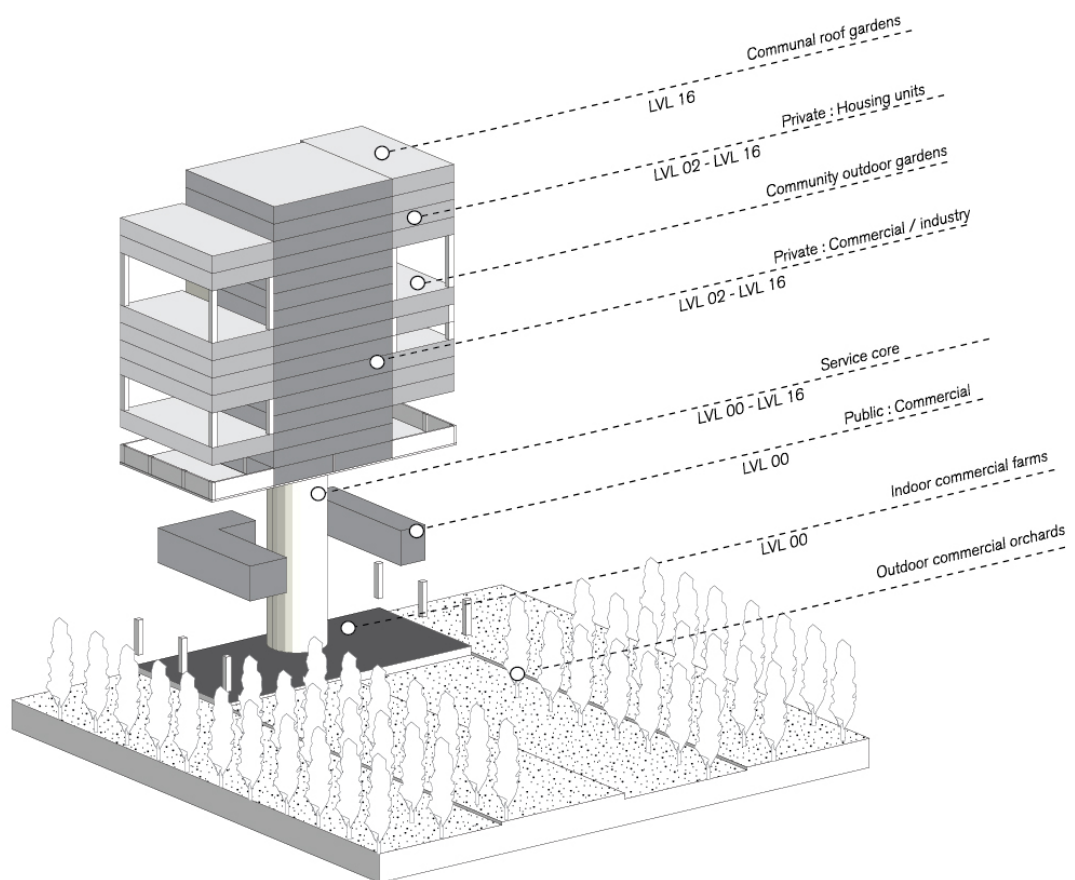
Adding service and structural cores

Typology 03 : Mixed farms



Introducing housing units

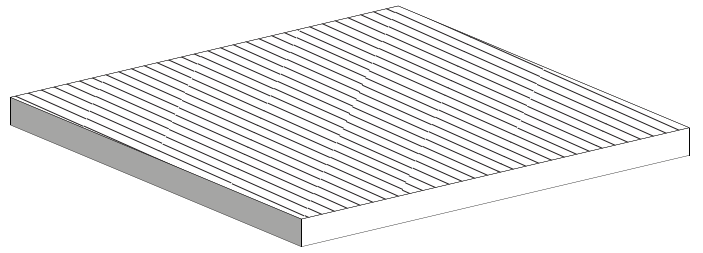




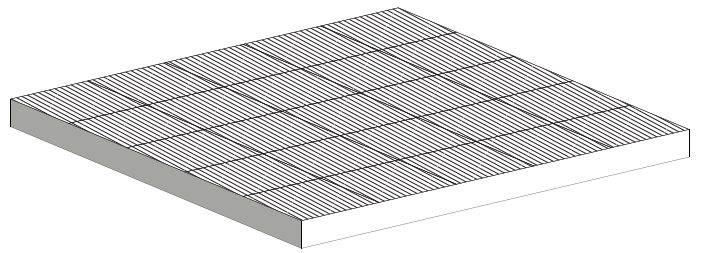
Typology 03 : Public function mixed farms

FAR : 2, 16 floors , 0.25Ha coverage

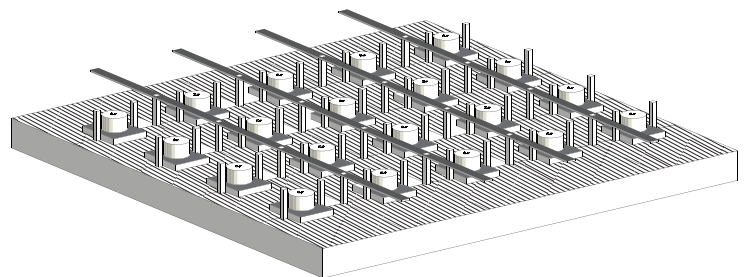
Drawn by author



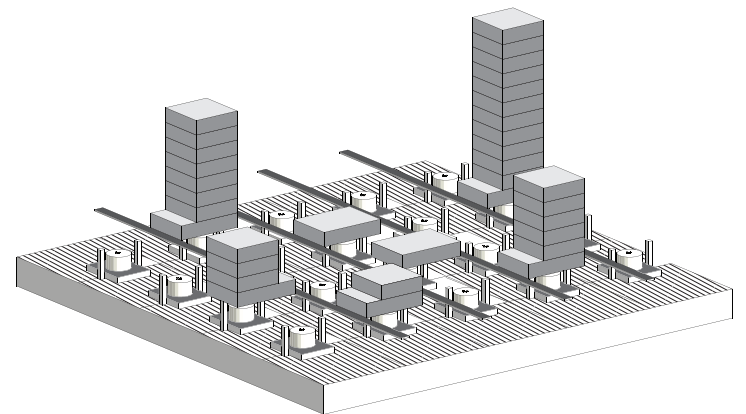
1 hectare plot



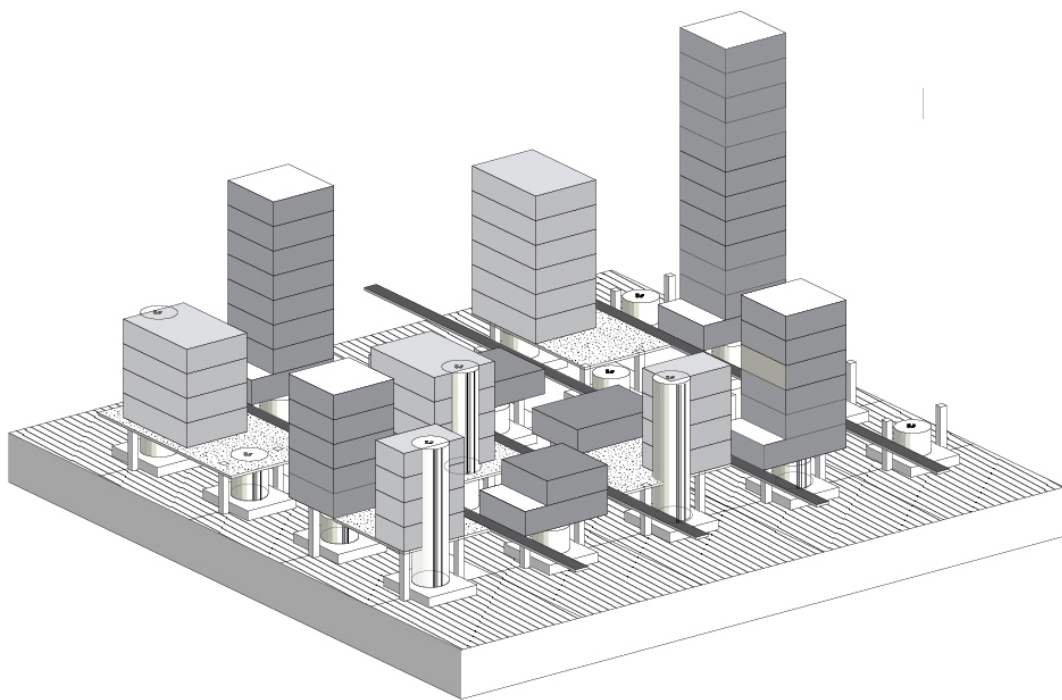
Plot divisions and plinth



Adding service and structural cores



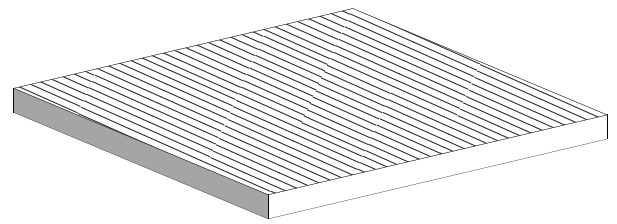
Introducing units



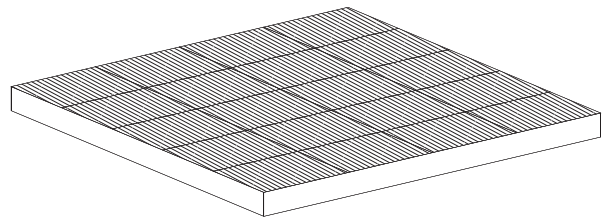
Typology 04 : Soilless mixed farms

FAR : 2, 16-32 floors , full coverage allowed

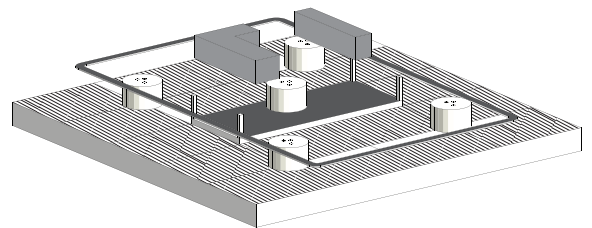
Drawn by author



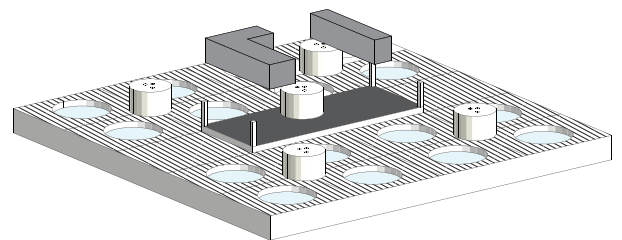
1 hectare plot



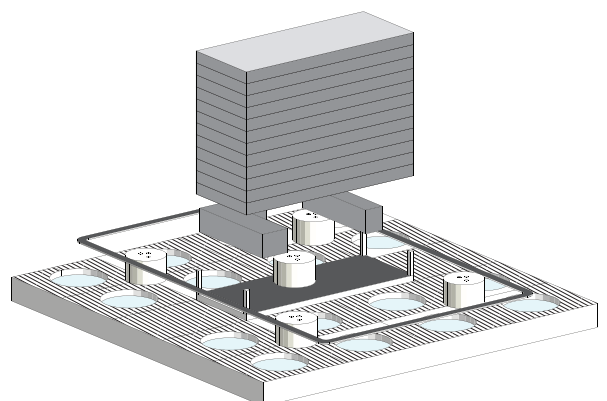
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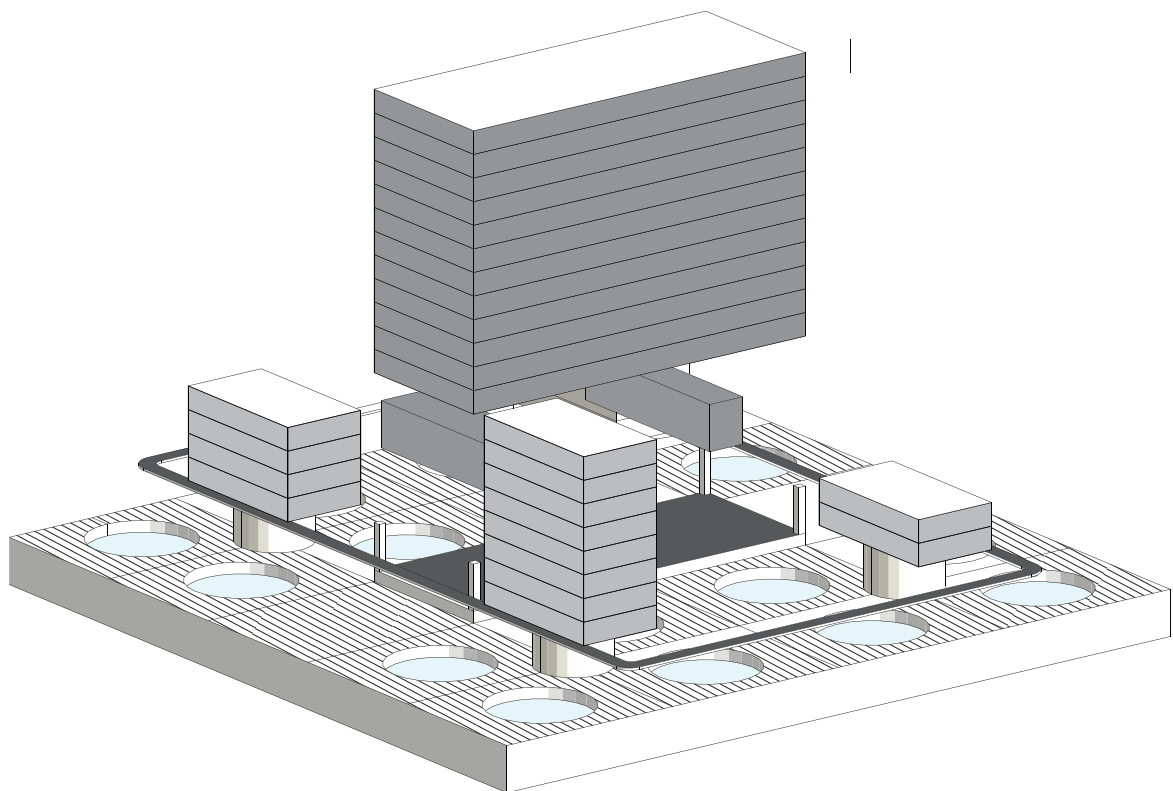
Plot divisions and plinth



Adding service and structural cores



Introducing units



Typology 05 :Fish farms

FAR :2, 16 floors , 0.25 coverage

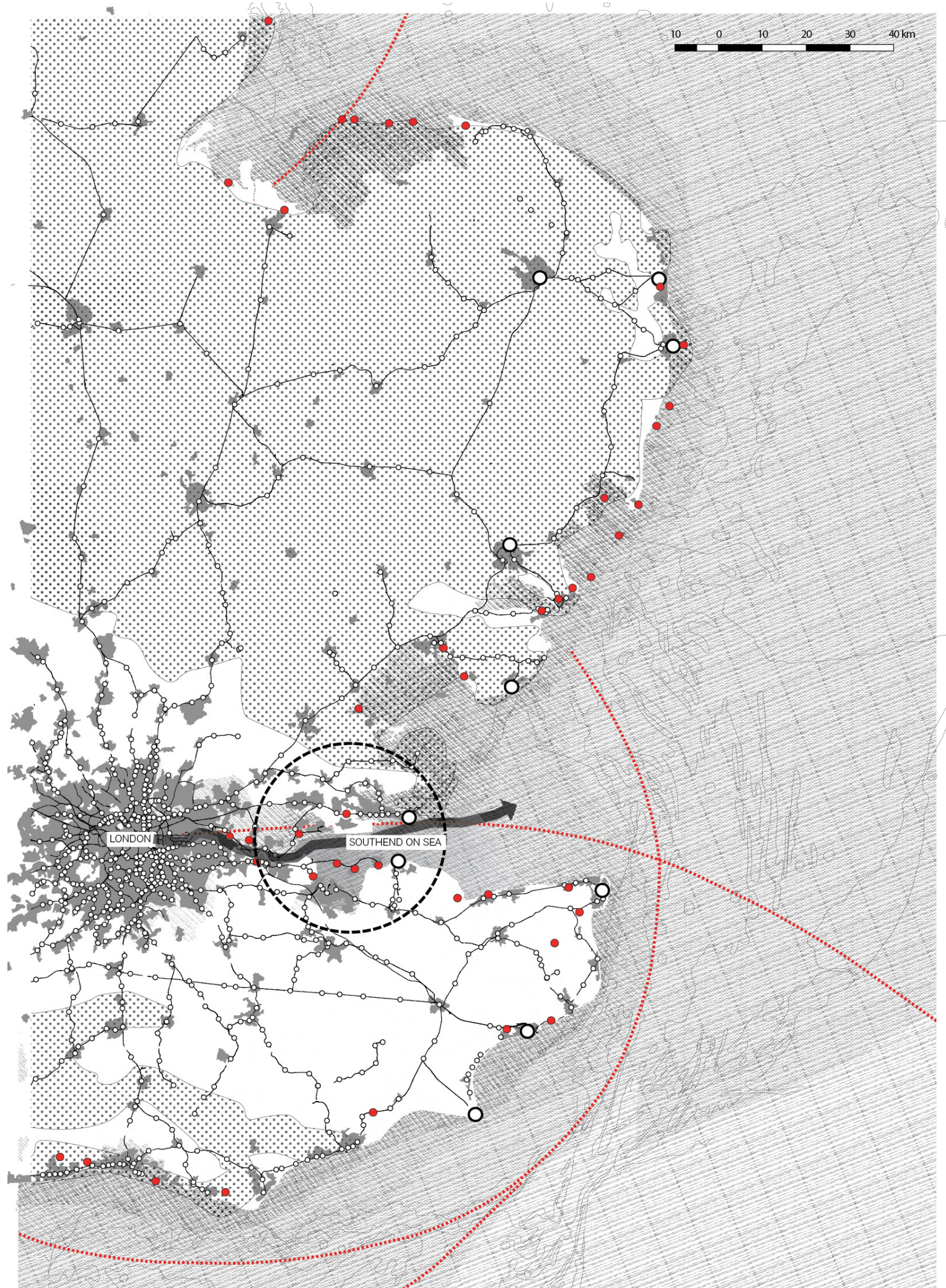
Drawn by author

Design Part II

Selecting the site



UK undesignated rural areas and their proximity to its large ports , drawn by author



UK East coast with main shipping routes and shipping density

Drawn by author



Southend on sea with its rural stripped of its existing spatial logic

Drawn by author

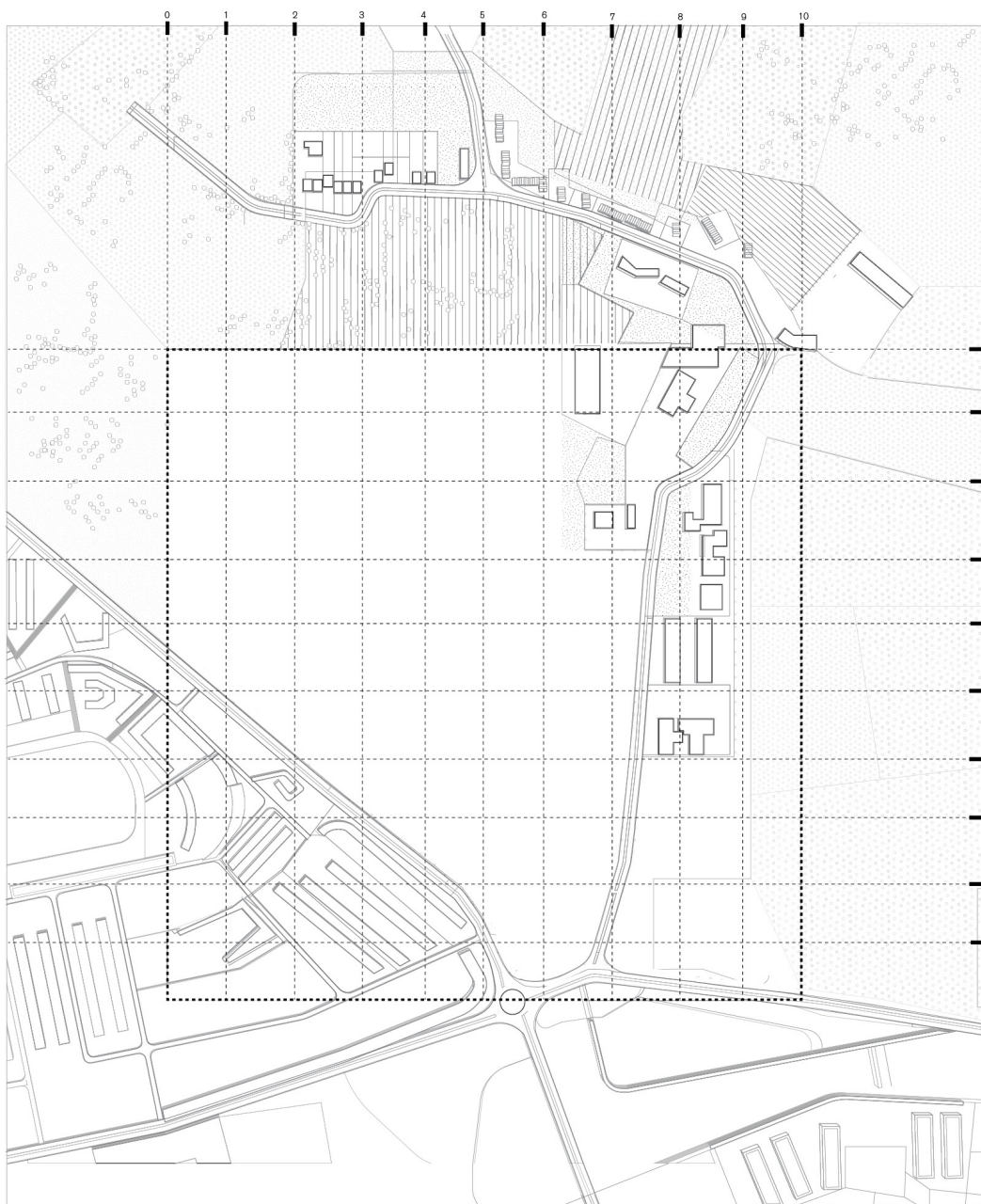
DESIGN PART III

Placing on site

SCALE 01 : Typical typology

Step 01 : The grid

Superimposing the first element of the rural city to create the road network



Plan

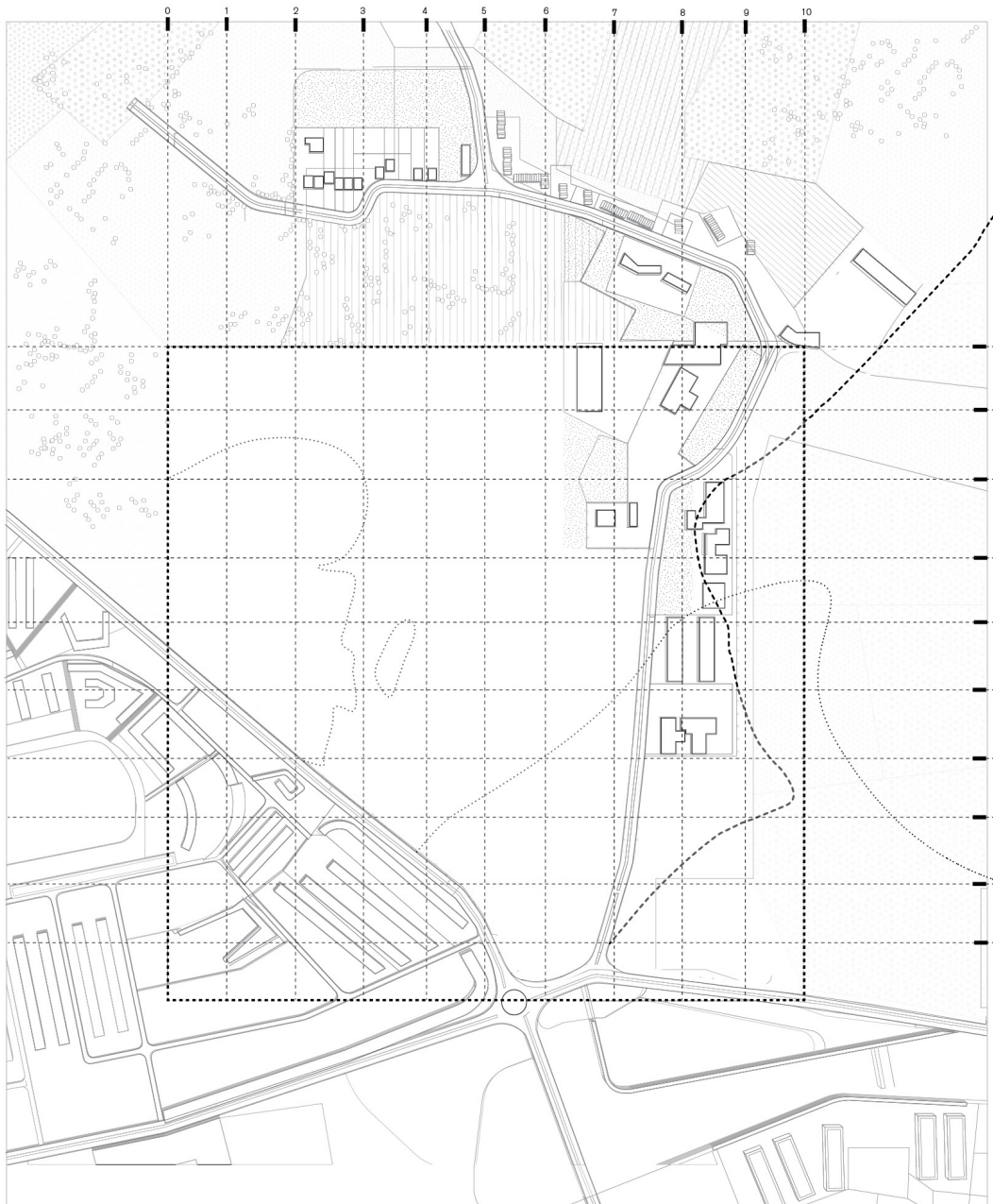


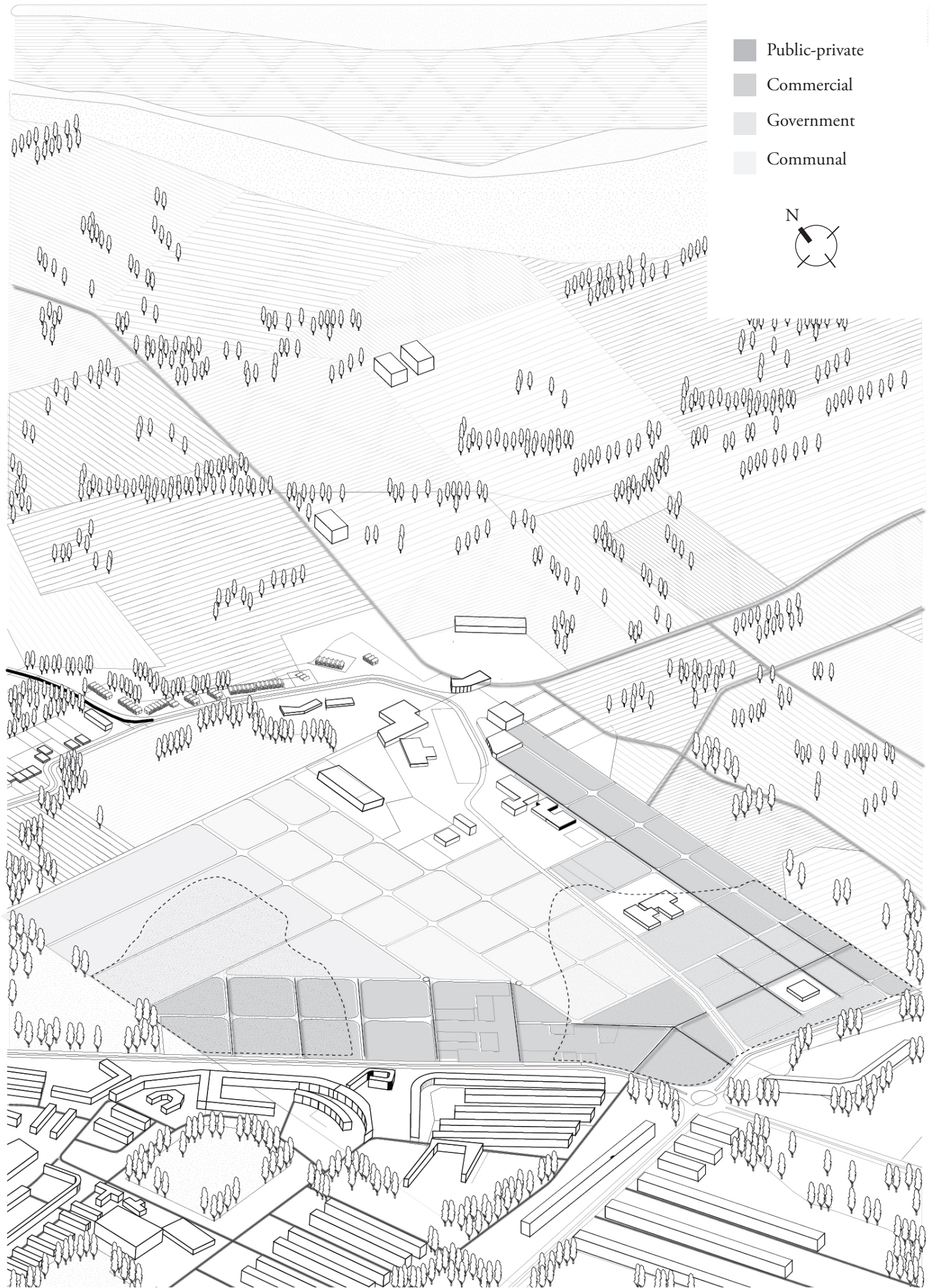
The proposed lines of connection to the new rural

SCALE 01 : Typical typology

Step 02 : Overlaying the site features

Delineating ownership types based on existing site conditions



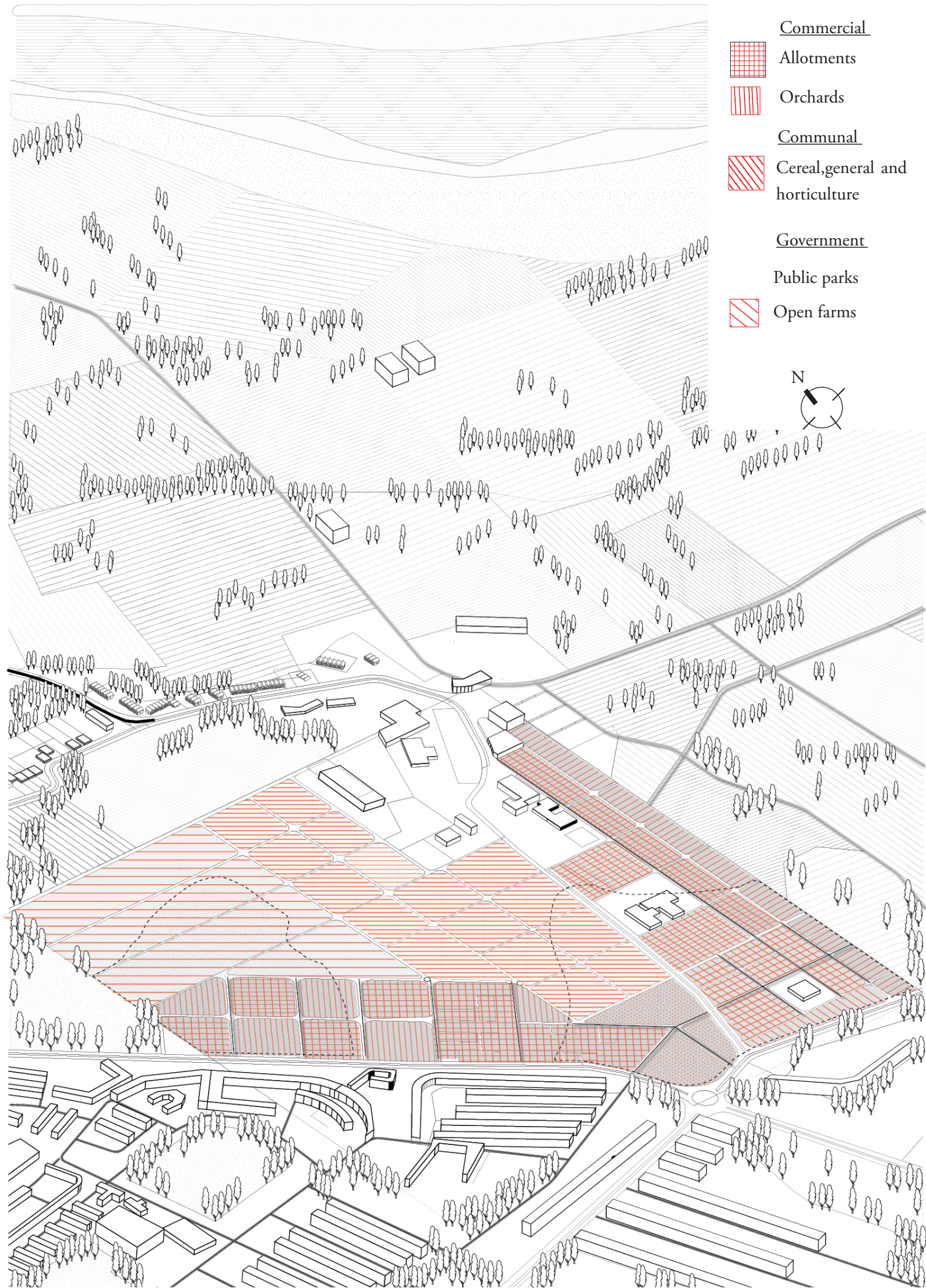


The new communal parcels

SCALE 01 : Typical typology

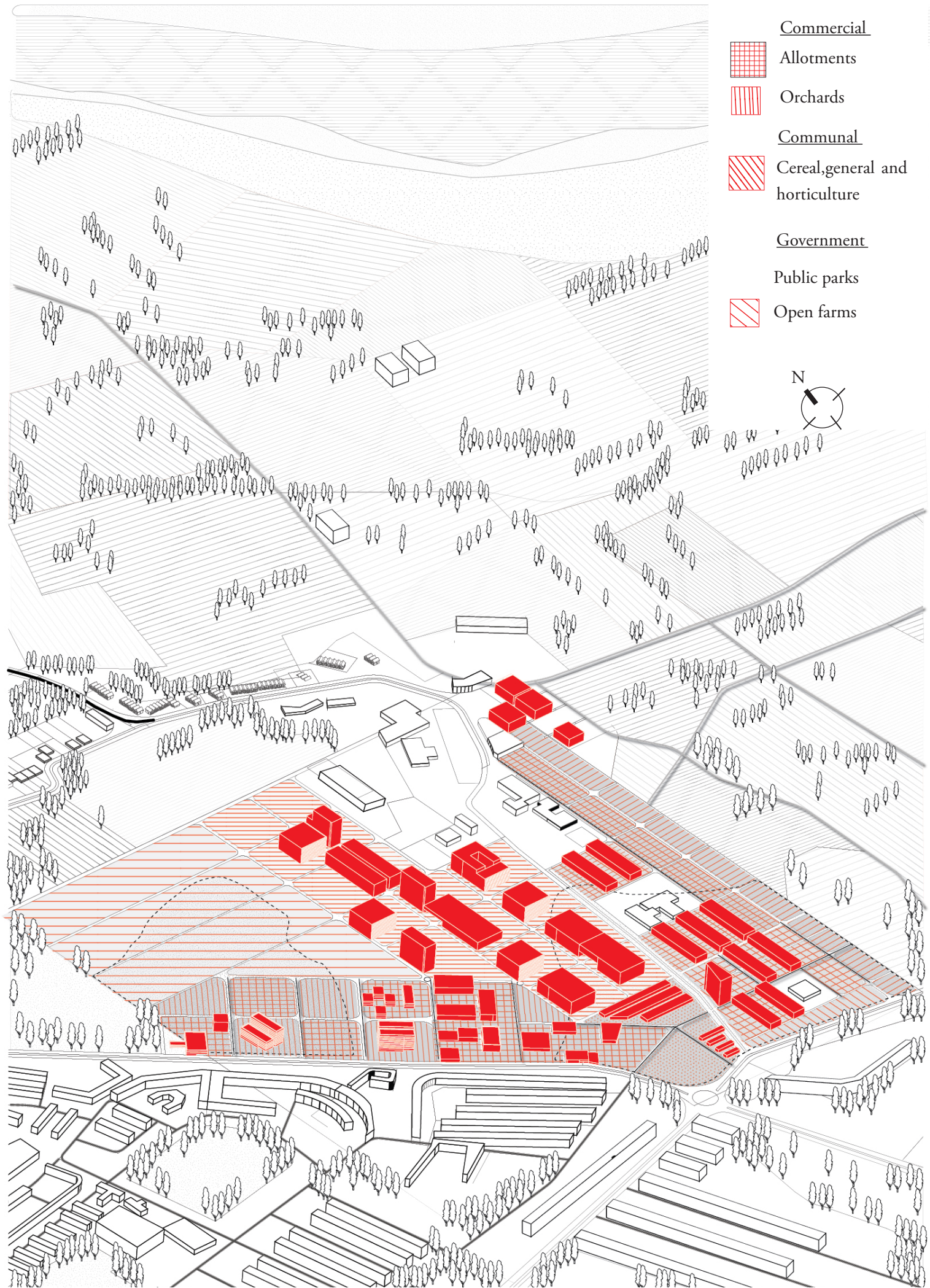
Step 03 : Superimposing typologies based on ownership types

Placing the plinth and the service core



SCALE 01 : Typical typology

Step 04 : Superimposing the built densities based on typologies



Commercial



Allotments



Orchards

Communal



Cereal, general and horticulture

Government

Public parks



Open farms

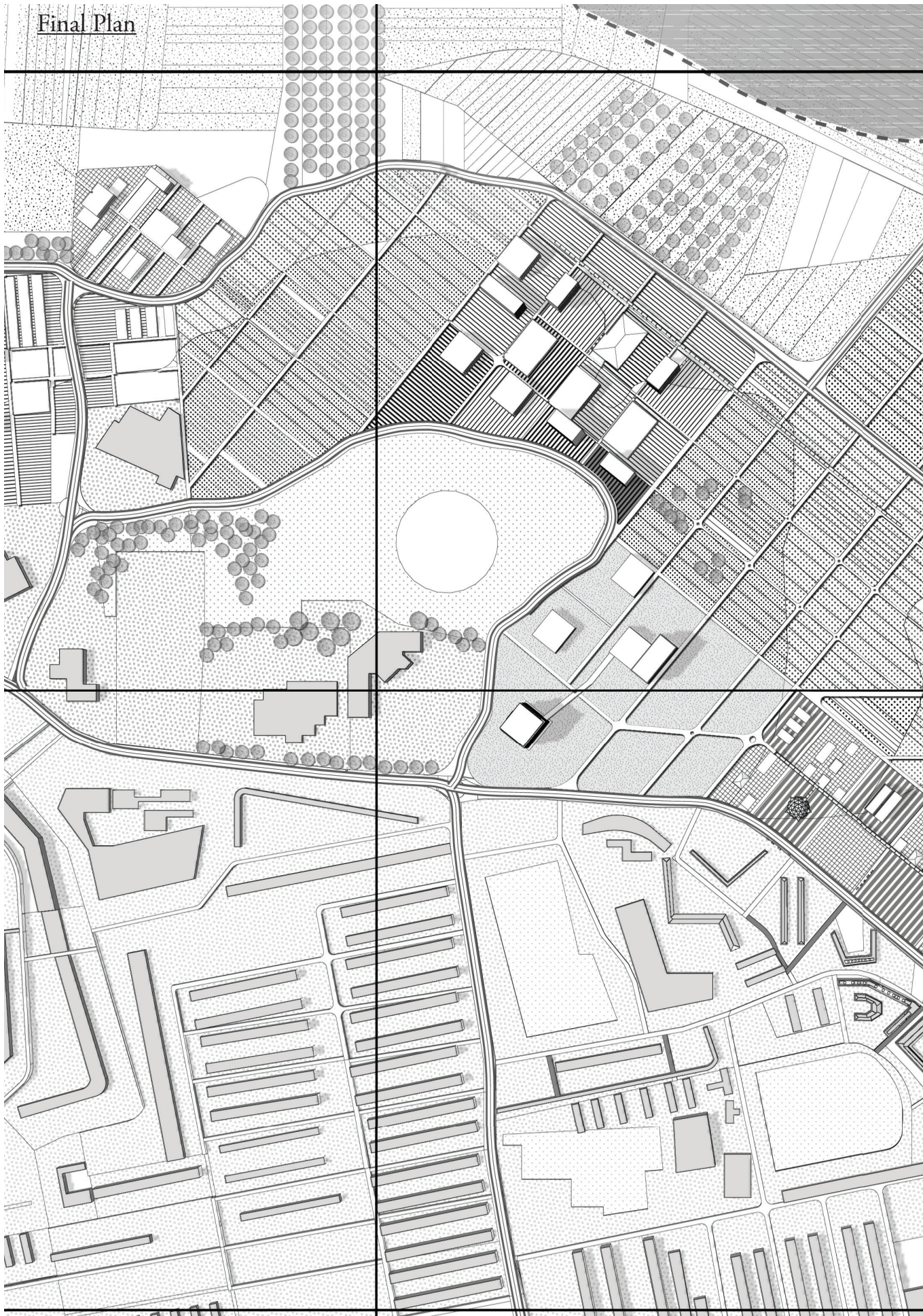


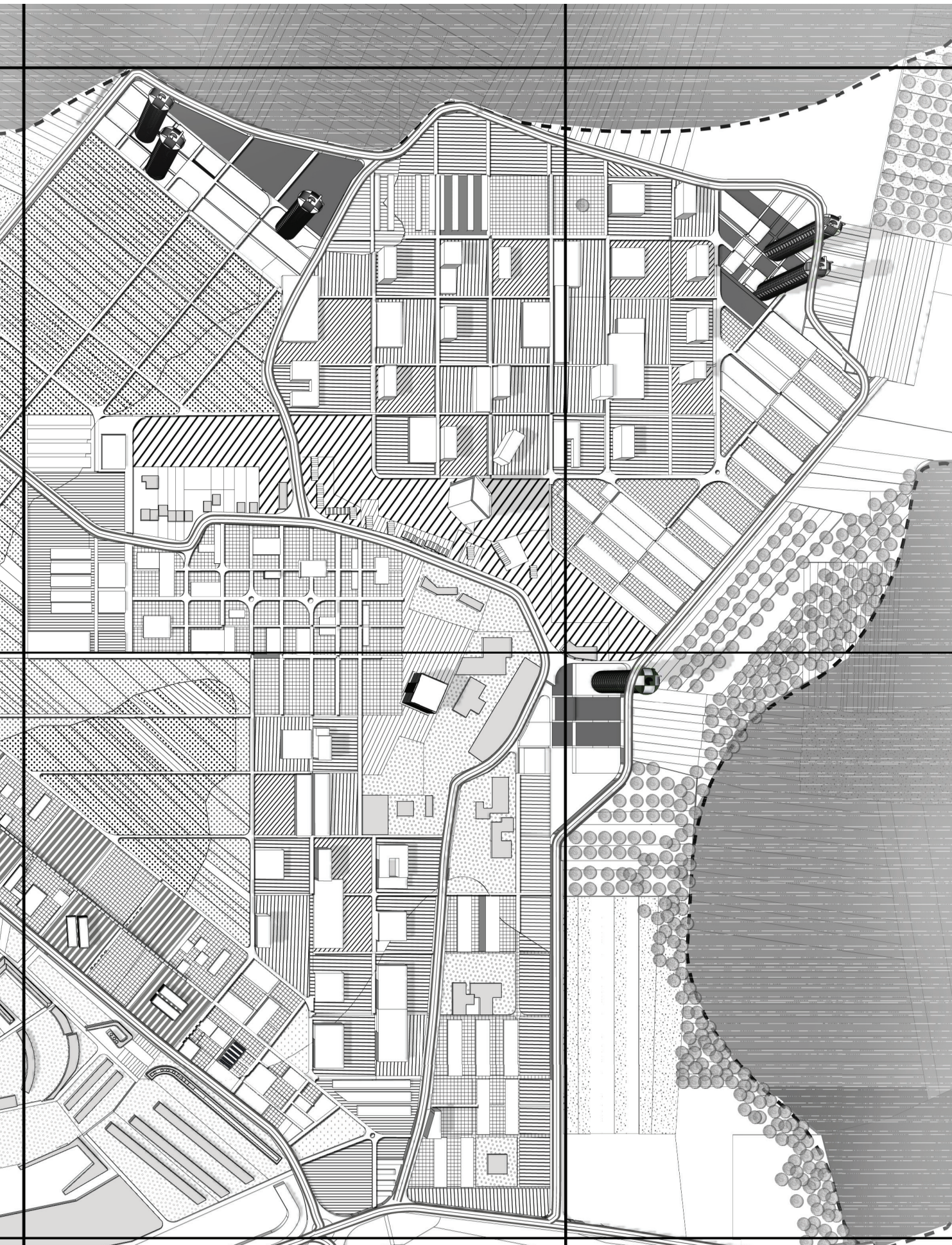
N

Replicating and zooming out



Final Plan





Part 01 : Design scalability

and the future of the rural in post Brexit UK

Presently over 60% of UK's rural land is under the threat of future urbanisation due to its current undesignated status (see chapter 2). Considering that Brexit will force a drastic change in trade relations globally, making the trade and import of food into the UK difficult any loss or repurposing of productive rural land will exasperate this situation further. The national farmers union of Britain is already predicting UK's food sufficiency factor to go down to a 50% by the year 2050.

In this context the proposed new rural city incorporates a strategy for both - expected urban growth as well as efficient use of land for agricultural production. By using minimal elements for design, the new city allows a certain flexibility that is able to accommodate any future uncertainties. As such, the main elements of the design that remain fixed even as the typology replicates include - the grid - as a tool for delineating ownership, the service cores - that act as the infrastructural exchange points between the city and the rural, the typology : that establishes the open built ratio and lastly the elevated superstructure that combines production with functions of the community

At each scale these elements produce different spatial and social qualities depending on the physical conditions of the site.

At the smallest scale, the design acts as a productive unit influenced mainly by the site topography. While the land is subdivided into well defined 1 Ha parcels the units on the other hand are more flexible, incorporating the act of production through various multipurpose spaces that can be attached or detached at the upper levels. Essentially the smallest scale incorporates the maximum living diversity with no direct connection to the regional city network.

Once replicated this typology meets the larger road network and begins to incorporate elements of food logistics such as - two way arterial roads, transport terminals, horizontal service cores that facilitate the exchange of raw materials from the city and packaged organic food from the new rural city. Furthermore, with the intermixing of communal spaces and access to more services the city is also able to accommodate diverse occupations at this scale.

More than half the British countryside at risk of 'urban sprawl' if planning laws are relaxed, campaigners warn

By LEON WATSON

UPDATED: 10:20 BST, 7 February 2012



Share



34

Urban sprawl will threaten countryside under a proposed system, it was claimed today.

The Campaign to Protect Rural England (CPRE) has published detailed maps of areas at risk of development.

They map Areas of Outstanding Natural Beauty (AONBs) under threat.

Tim Breitmeyer: Councils need to rethink attitude to rural development after Brexit

Brexit could leave Britain with a bare larder, farmers warn

NFU says UK produces only 60% of its own food and must increase production to avoid food insecurity after leaving EU



▲ The NFU says vegetable shortages in Europe and the US this year have highlighted the UK's over-reliance on other countries for food. Photograph: Chris Ratcliffe/Bloomberg/Getty Images

Britain must increase home-grown food production and build stronger supply chains to face Brexit uncertainties, the National Farmers Union has said.

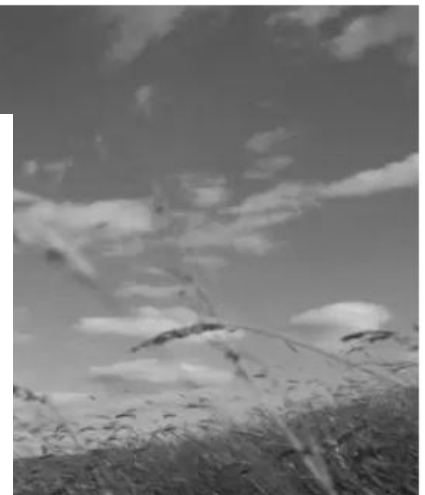
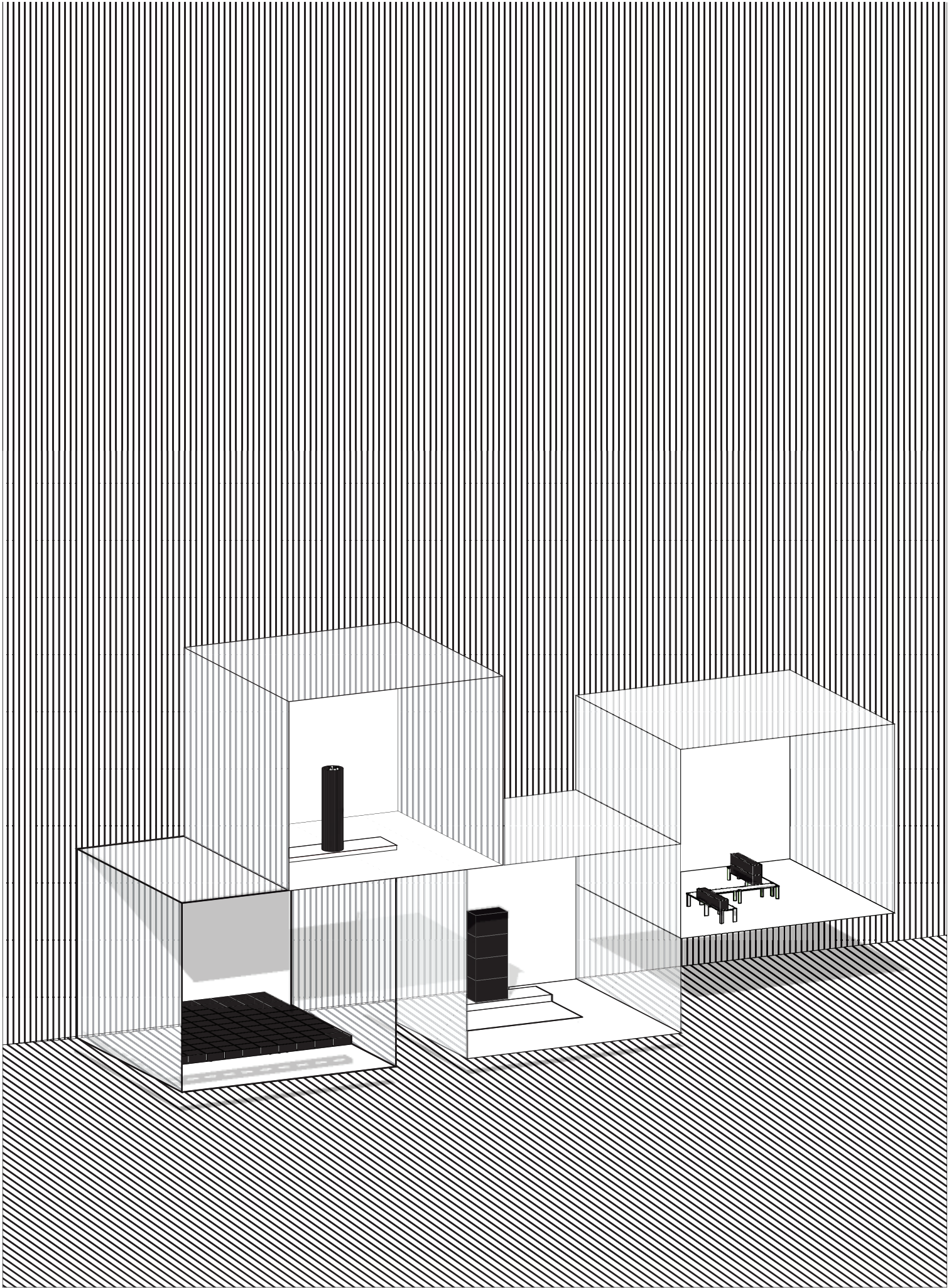


Figure : Increasing population and changing economic relations post Brexit will have immediate and lasting impact on the rural countryside of UK . Source : Mail online and Yorkshire post



At the regional scale the design is able to interact with the existing context through a series of interchanges . The first interchange between the proposed design and the city is the infrastructure terminal that essentially facilitates the exchange of services and goods between the industrial and the productive city .

Just as the industries were fed by the rural , the new rural city is now fed by the city and its industries through organic and nutrient based raw materials . Furthermore by internalising the logistics of food distribution, the design also opens up the opportunity to redefine the port as a new productive space that can be used to introduce more advanced and sustainable farming techniques .

Unlike the industrial city, each element of the new rural city reinforces the importance of attaching the act of production to land. Once placed on site , these elements are able to superimposing clear lines of ownership that helps regulate both the extent of urban growth and the type of farming. As the design interacts with more and more elements of the industrial city it is able to adopt new methods of production and logistics.

The fixed elements of the new city

The grid - as a tool for delineating ownership , *The service cores* - that act as the infrastructural exchange points between the city and the rural, *The typology* : that establishes the open built ratio and lastly *The elevated superstructure* that combines production with functions of the community

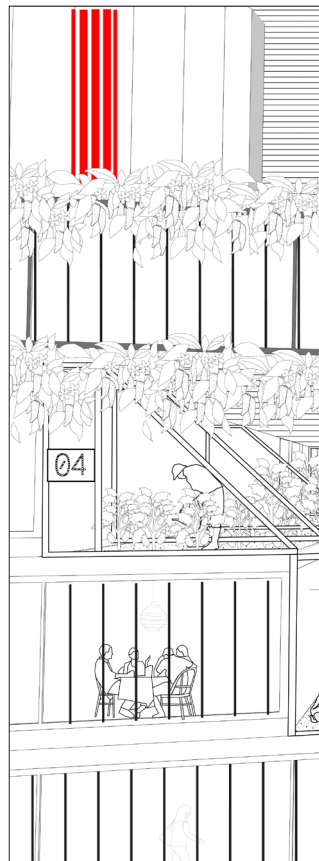
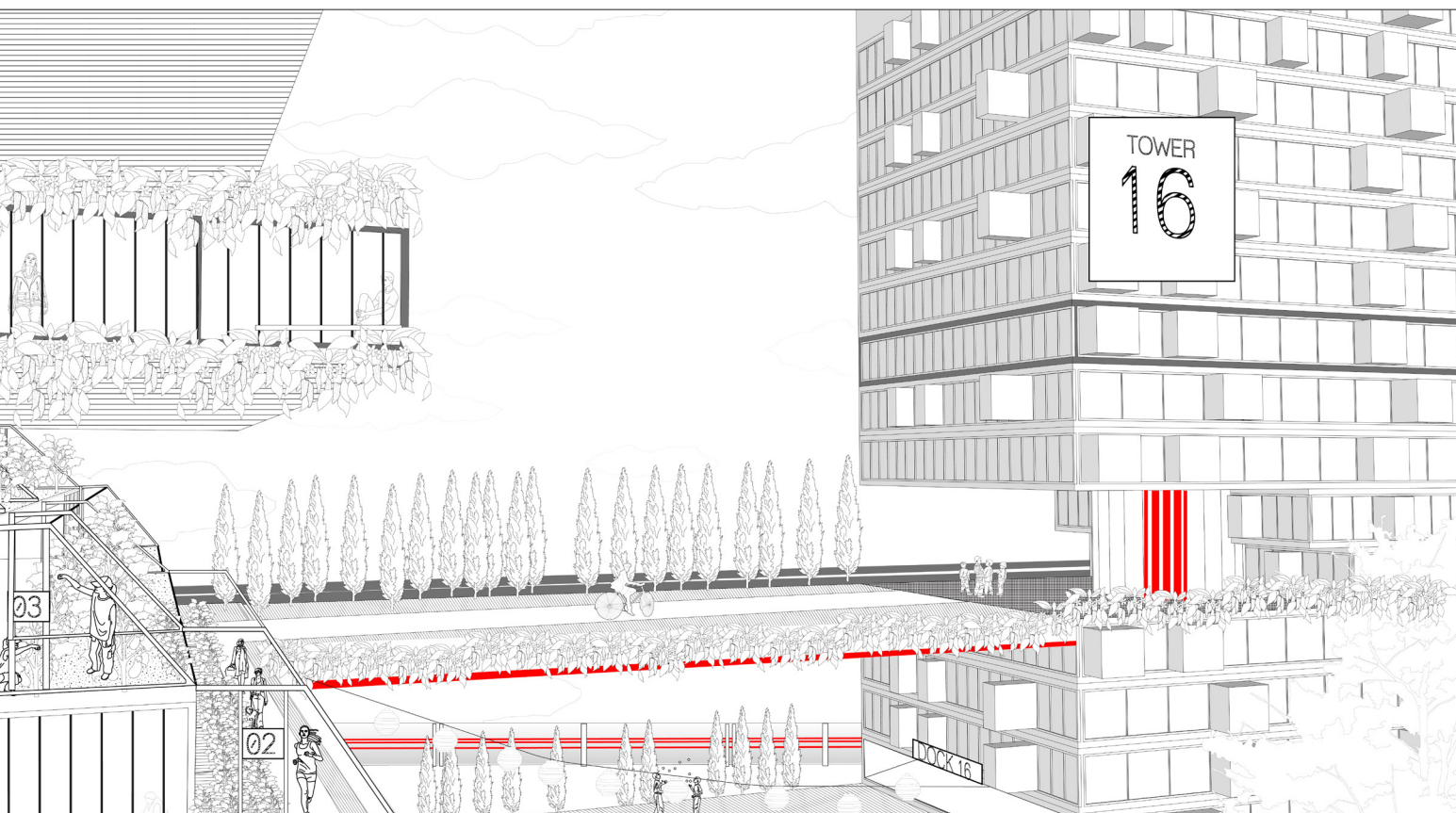


Figure : *Elevated social spaces that can create unique communal parks with a variety of farming types*



Figure : *New living typologies that are built around the space of production*



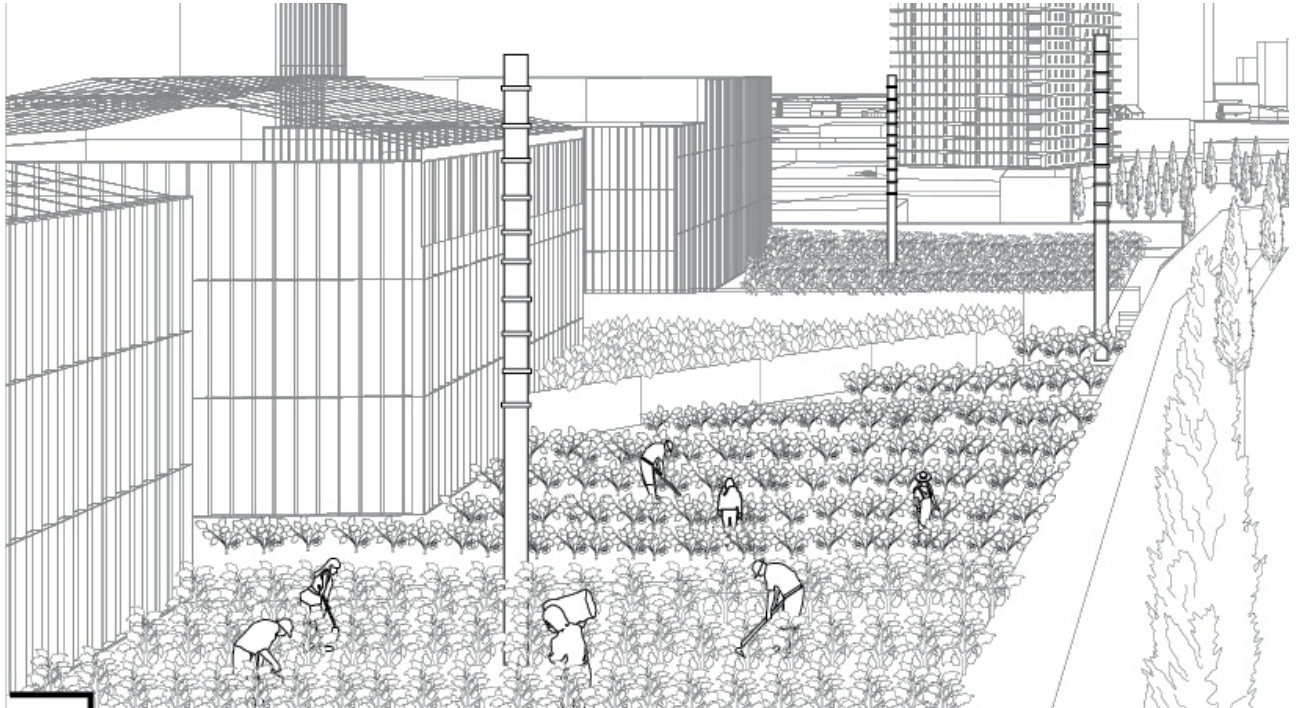


Figure : *The communal farm at the city edge*

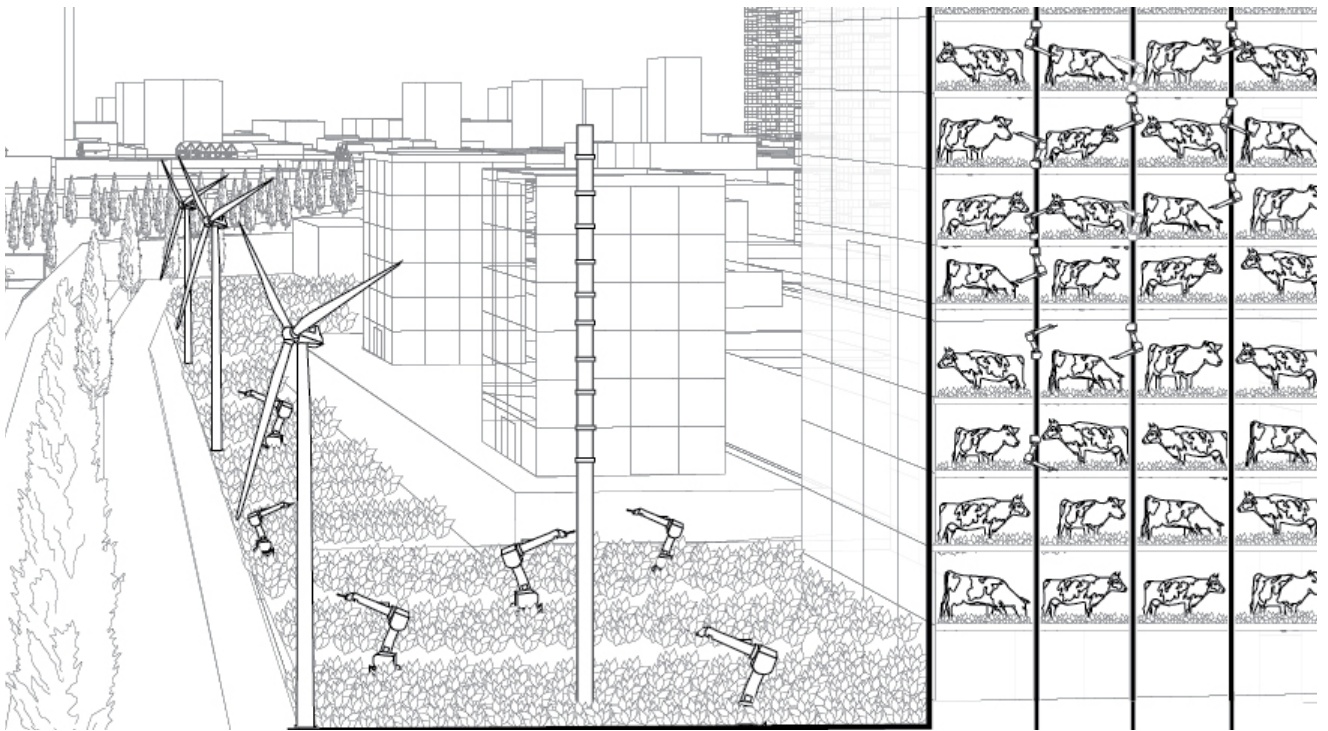


Figure : *The commercial farms at the city edge*

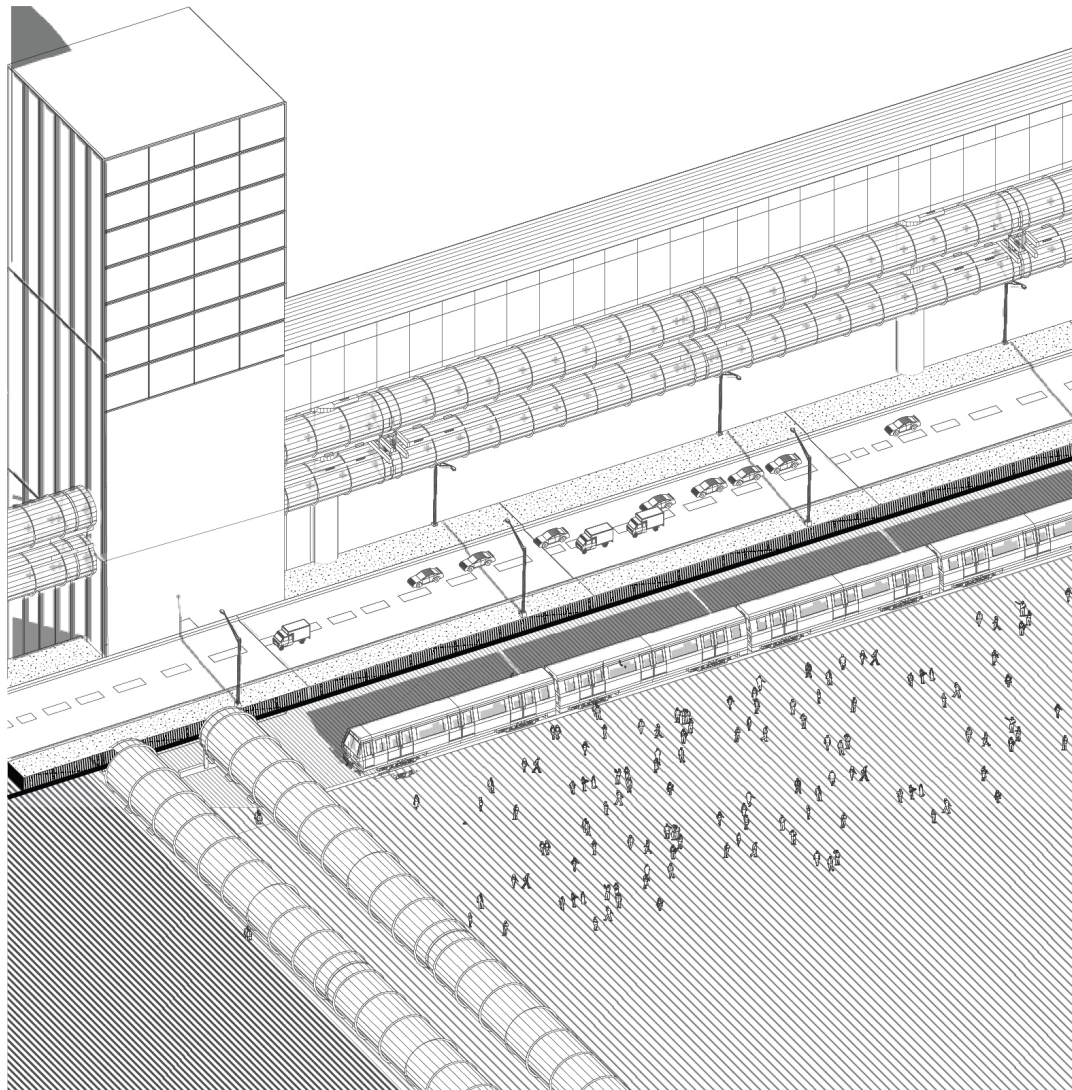


Figure : *Logistical edge between two typical typologies* , Drawn by author

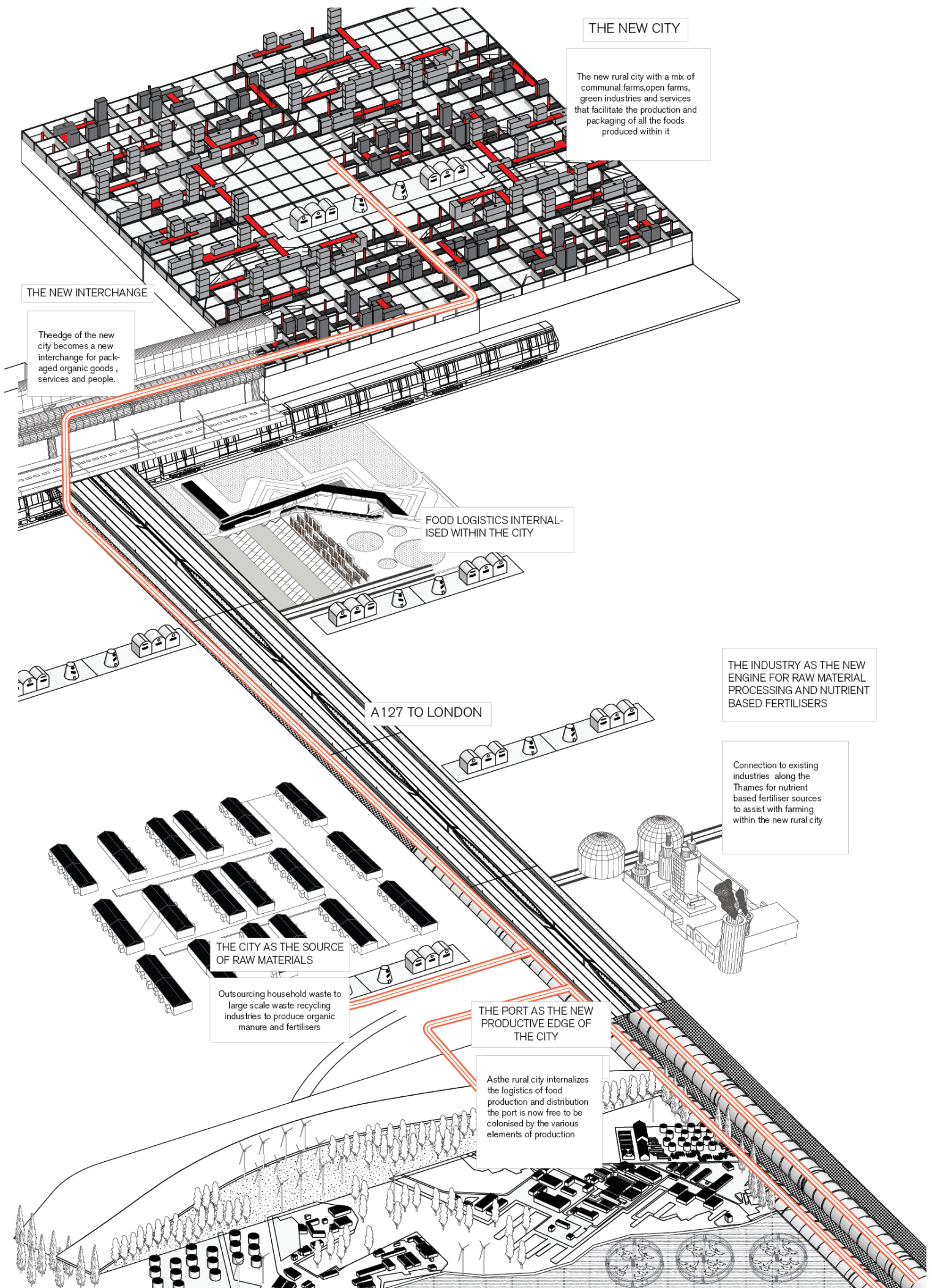


Figure : The new rural city at its points of interchange at the regional scale , drawn by author

Cambodia's sugar rush leaves farmers feeling bitter at 'land grab'

Kate Hodal reports from Koh Kong, where villagers claim they are losing their livelihoods to plantations that supply Tate & Lyle



The plantation extends as far as the eye can see, with tall sugar cane leaves swaying against the dusky blue sky and distant horizon. There are no houses, no animals, just rows of cane.

Standing by a rickety wooden fence that separates the field from a road, Yoen Sarin, 29, waves his hand towards the plantation. "The cane field extended from there to just over there."

Economic disaster beckons as water-hungry investors buy up Africa's land

Water drawn from rivers, dams or underground to irrigate new farms in Africa may severely affect users downstream



Irrigation schemes are too reliant on 'blue' water, drawn from rivers and lakes, say critics. Photograph: Henry Vaughan/AFP/Getty Images

UK investors gather for controversial Africa land summit

International development and environment charities to protest against 'land grab' outside Agriculture Investment Summit



△ An estimated 70m hectares of agricultural land – or 5% of Africa – has been sold or leased to western investors since 2000. Photograph: Siphwe Sibeko/Reuters

Pension fund managers and hedge funds gather in London on Tuesday for a summit to discuss the next big investment opportunity: buying up swaths of African farmland.

The Agriculture Investment Summit promises guidance through the

complex world of land acquisition in African farmland by "ecologically sound" sovereign wealth funds and speculators. And possibly even conflict, some of the experts have predicted.

Attracted by low land prices and the promise of high returns, hundreds of investors from around the world have acquired millions of hectares (some in excess of 100,000 hectares) of underused land where they plan to grow food crops. They have struck deals with governments to gain access to water for years.

London School of Economics researcher Martin Korten has written a book of 50 academic essays on the topic, titled "The Race for Africa's Land: Major Foreign Direct Investments in the 21st Century".

Part 02 : Design replicability and its impact on UK's increasing land grabbing

In an attempt to take advantage of the cheap labour and land that is mainly available in the global east many British companies have made large scale investments to buy productive farmland in countries such as Africa and India (see figure) . Presently UK has bought the rights to more than 3 million hectares of land, (the equivalent to almost two thirds of UK's total farmland) collectively from over 30 countries in the world (Swanson,2015). This has globally resulted in the displacement of farmers and uprooting of rural communities including the destruction of ecosystem on a massive scale . While on one hand, these out sourced mega-farms allow the production of crop products that can otherwise not thrive in UK's local conditions, on the other hand it deprives the local communities and farmers of their basic means of sustenance leaving many in poverty and hunger.

Since the decline of the British empire, many of UK's former colonies have failed to tackle effectively, the aftermath of their late but rapid industrialisation . In countries such as India , a lack of clear planning and environmental laws has left vast stretches of its productive rural land

at the mercy of speculators and multi- national companies .In fact, the government further pushes for foreign investments by providing soft loans and incentivising commercial farming, citing them as crucial means to provide their citizens with a better access to social and economic services . Thus, while UK continues to enforce its colonial ideologies through a much more advanced and formal capitalist system of demand and supply, its former colonies continue to encourage such unethical practices in order to become competitive members of the global economy.

By redesigning UK's rural and reestablishing new forms of ownership the design tries to address this very contradiction. Through a new system of land redistribution it gives back land to the communities, generating a new value that makes productive land an indispensable element of the new city. The new city is built around it and built with it , every member of the new city owns this land and also equally shares this land .

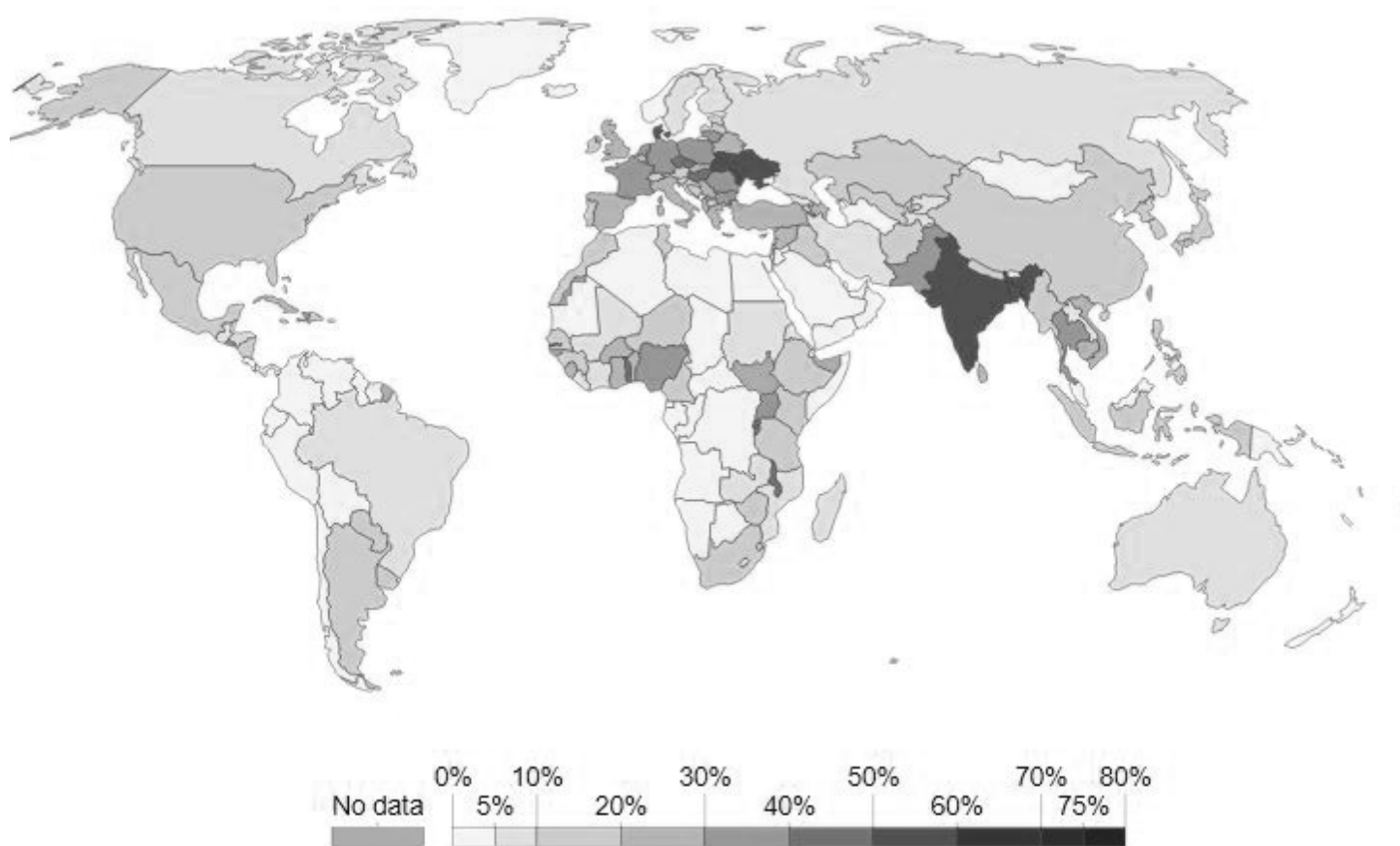


FIGURE 00 : *Share of global land area used for arable agriculture , 2014* Source : World Bank , 2014 .

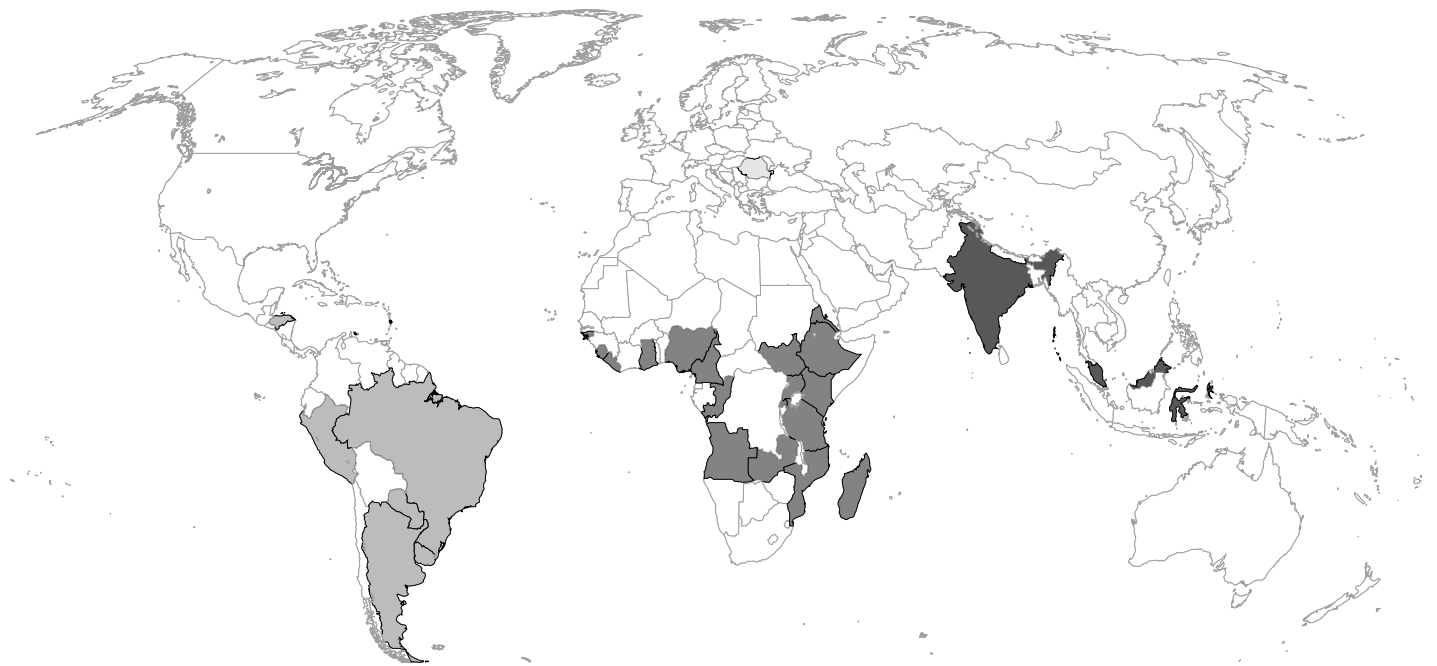
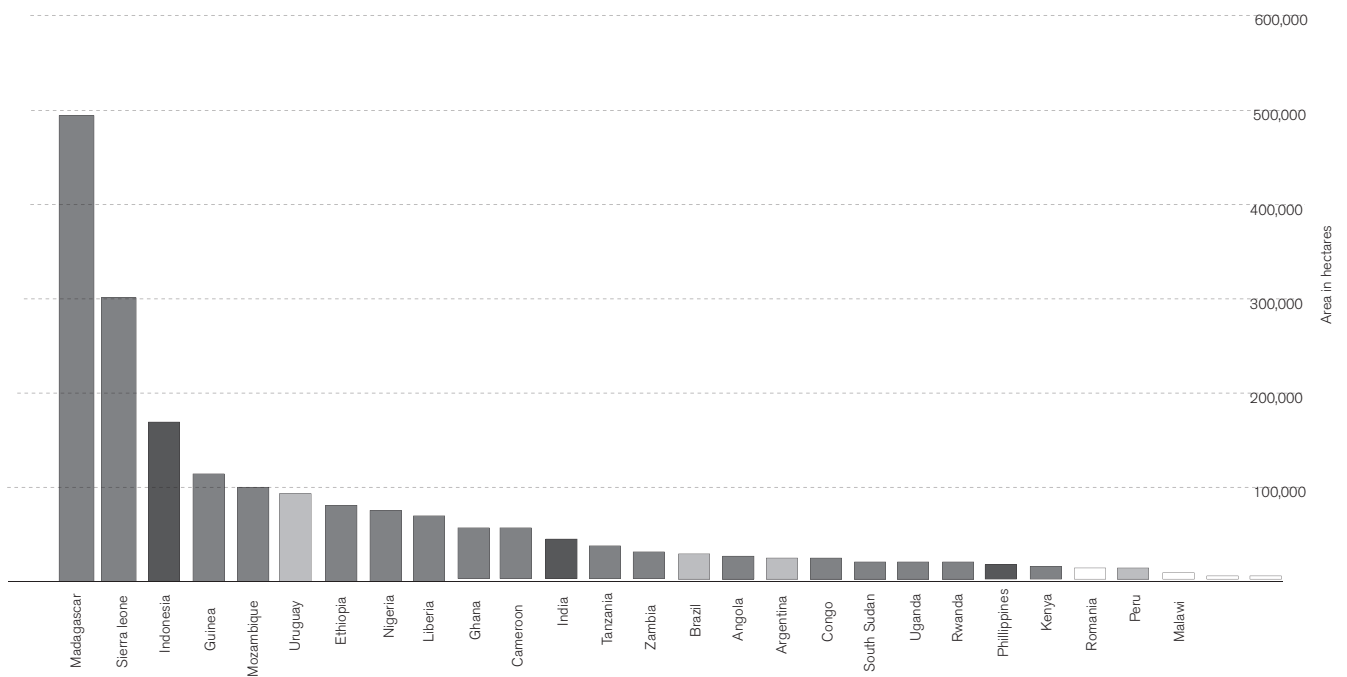


FIGURE : UK acquired agriculture land globally as of 2016 , Source : statistica.com, 2016 , drawn by author



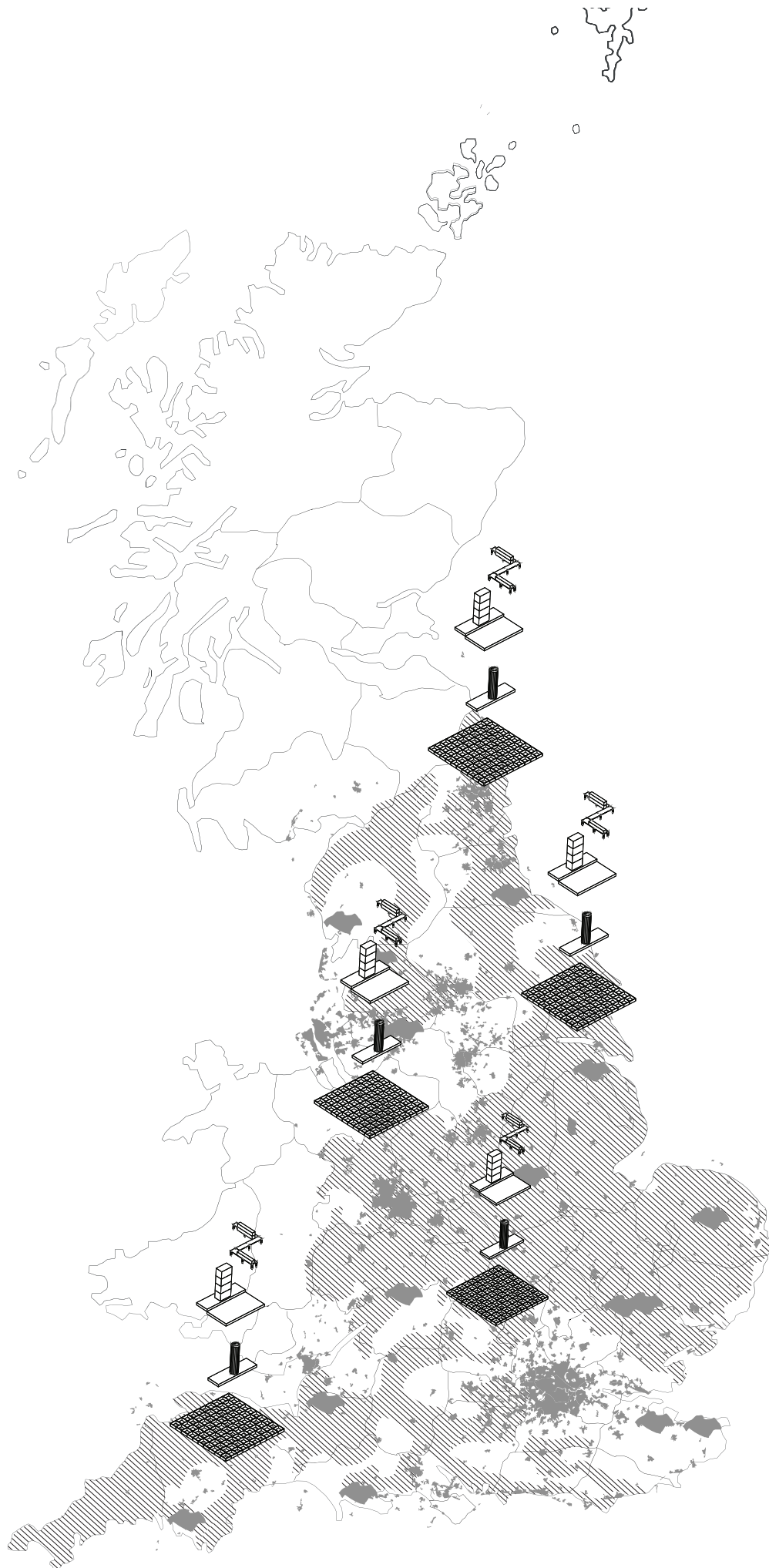


FIGURE : Replicating the design to reappropriate the UK rural landscape

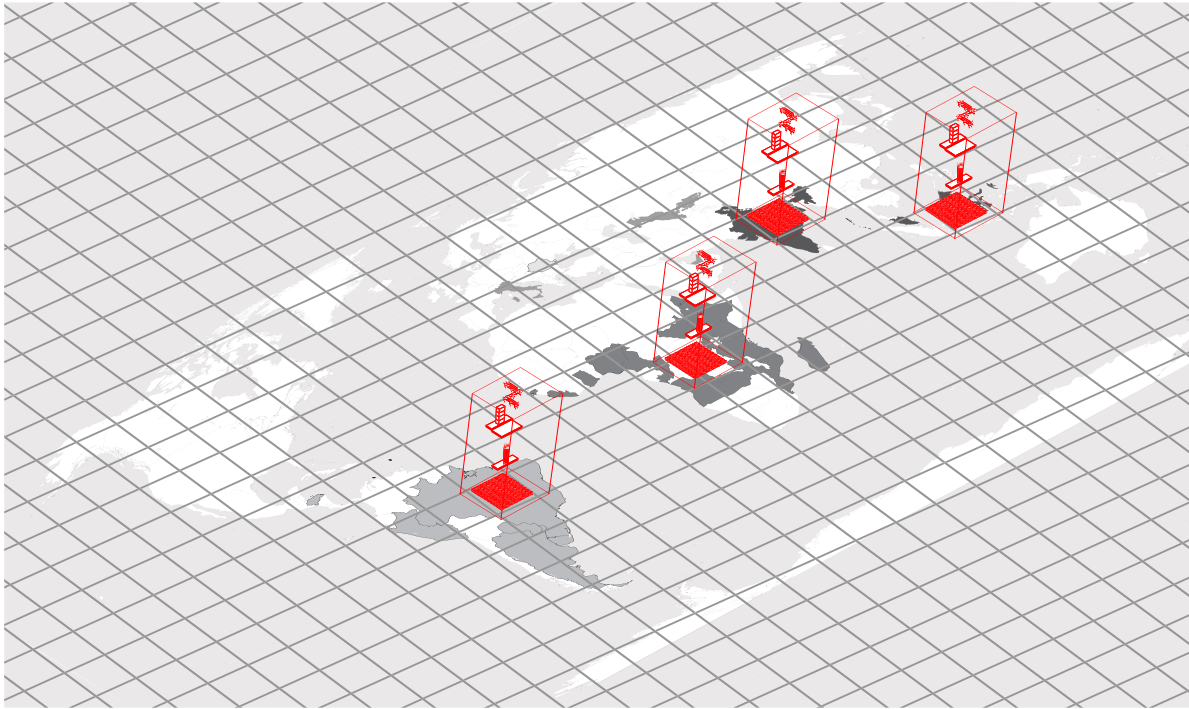


FIGURE : *Replicating the design to give acquired land within UK's former colonies , drawn by author*

Considering the fact that almost 60% of UK's rural land while being productive is either privatised, heavily industrialised or at the risk of future urban growth, the proposal to reappropriate farmland into smaller communal parcels will work effectively within UK . Since the elements of the design module can be replicated globally as a new masterplan for the rural cities which can both give back valuable land to communities and also increase productivity with efficient utilisation of technology and investment .

The context of Delhi ,is a perfect example of a colonial city which once had a strong rural character but over the years with gradual industrialisation became one of the most densely populated cities in India Along the fertile banks of the river Yamuna, that cuts through the city dividing into two unequal eastern and western halves, ruins of the industrialist landscape are very much visible . The proposed design can become an effective way to repurpose these post-industrialist ruins into small productive islands within the city where food can be produced and sold at a much cheaper rate since the cost of the logistics will become minimal . Furthermore , by utilising technology effectively ,parcels within these food islands can also be rented out to farmers during high drought seasons or unfavourable weather conditions .

Thus, the proposal for the new rural city will not only provide UK with new productive land , and empower farming communities equally it can also effectively reduce the act of land grabbing on a global scale while opening the avenue for a new food economy , where investments can be directed towards introducing and exchanging services

The elements
of the new city

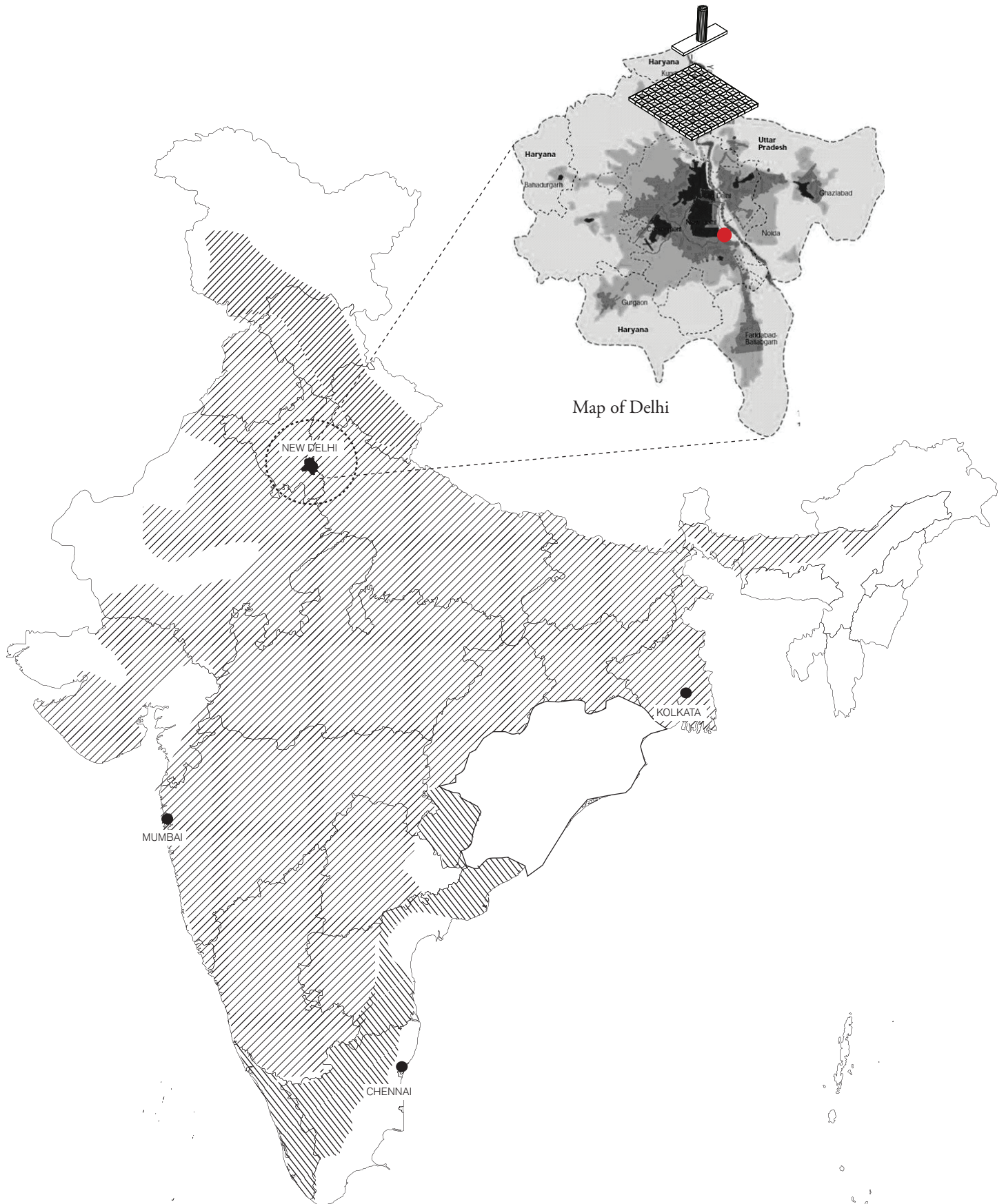
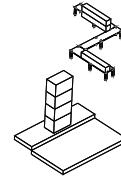


FIGURE 00 : *Existing arable land in India* , Source : National institute of Hydrology, India 2012 *drawn by author*

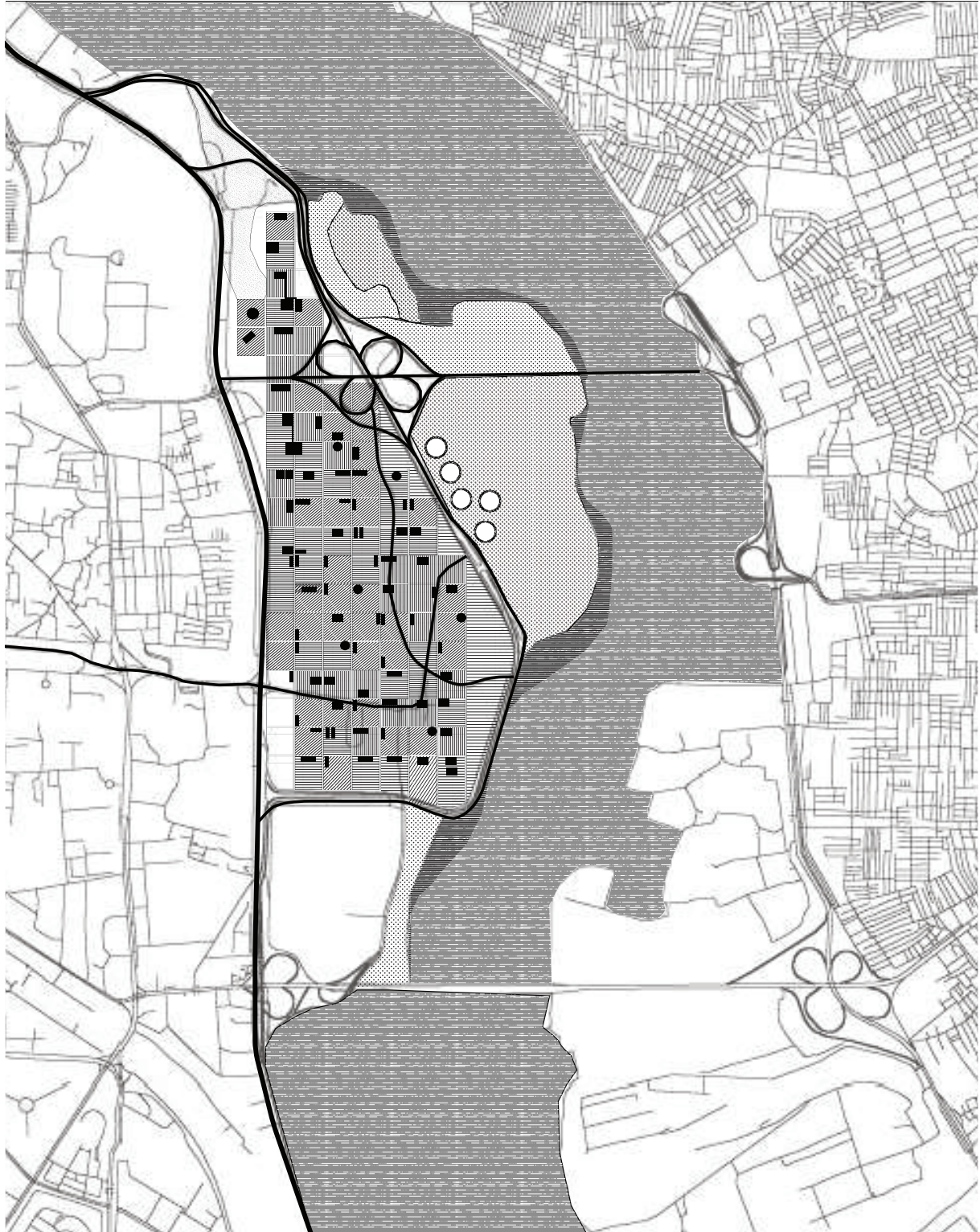
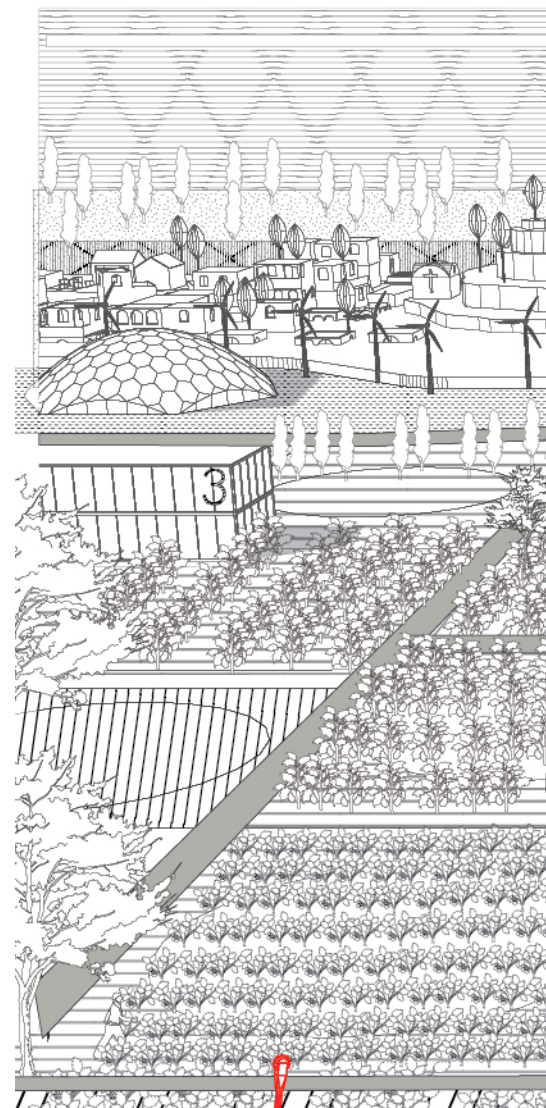
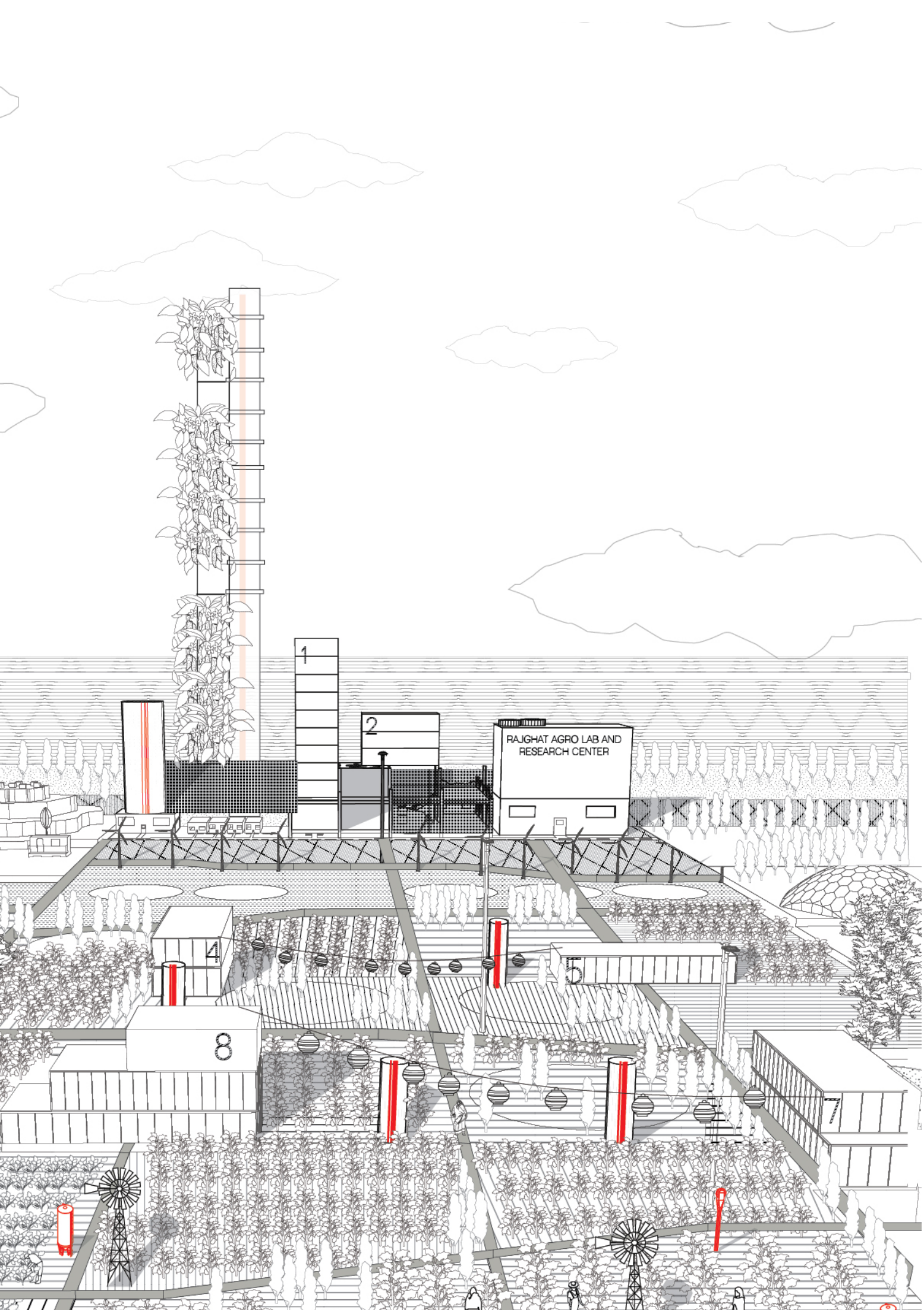


FIGURE : Placing the design in the post industrialist landscape of Delhi , seen here the Rajghat powerplant land reappropriated , drawn by author

FIGURE : **Repurposing the post industrialist ruins of Delhi :**
Reclaiming vital productive land within the densely urbanised city of Delhi by repurposing abandoned ruins of the industrial city , in this case a non functional coal based powerplant along the banks of the river Yamuna that could be reappropriated and sold out to farming communities around the city to make food available at a much





Part 03 : Commercial food production and labour

The mechanised commercial farms :

By reducing the footprint of animal based farms the rural city creates a new typology of concentrated farms where all activities of animal based production and distribution are internalised so that land can be utilised for other productive purposes . In doing so , the new animal farms have been reimagined as highly mechanised multi-level towers that need little or no manual supervision . This reduces the usual competition for labour between commercial and non commercial farming practices , and also makes commercial farming an expensive method of production which can help in eventually pushing towards a more sustainable consumption pattern .

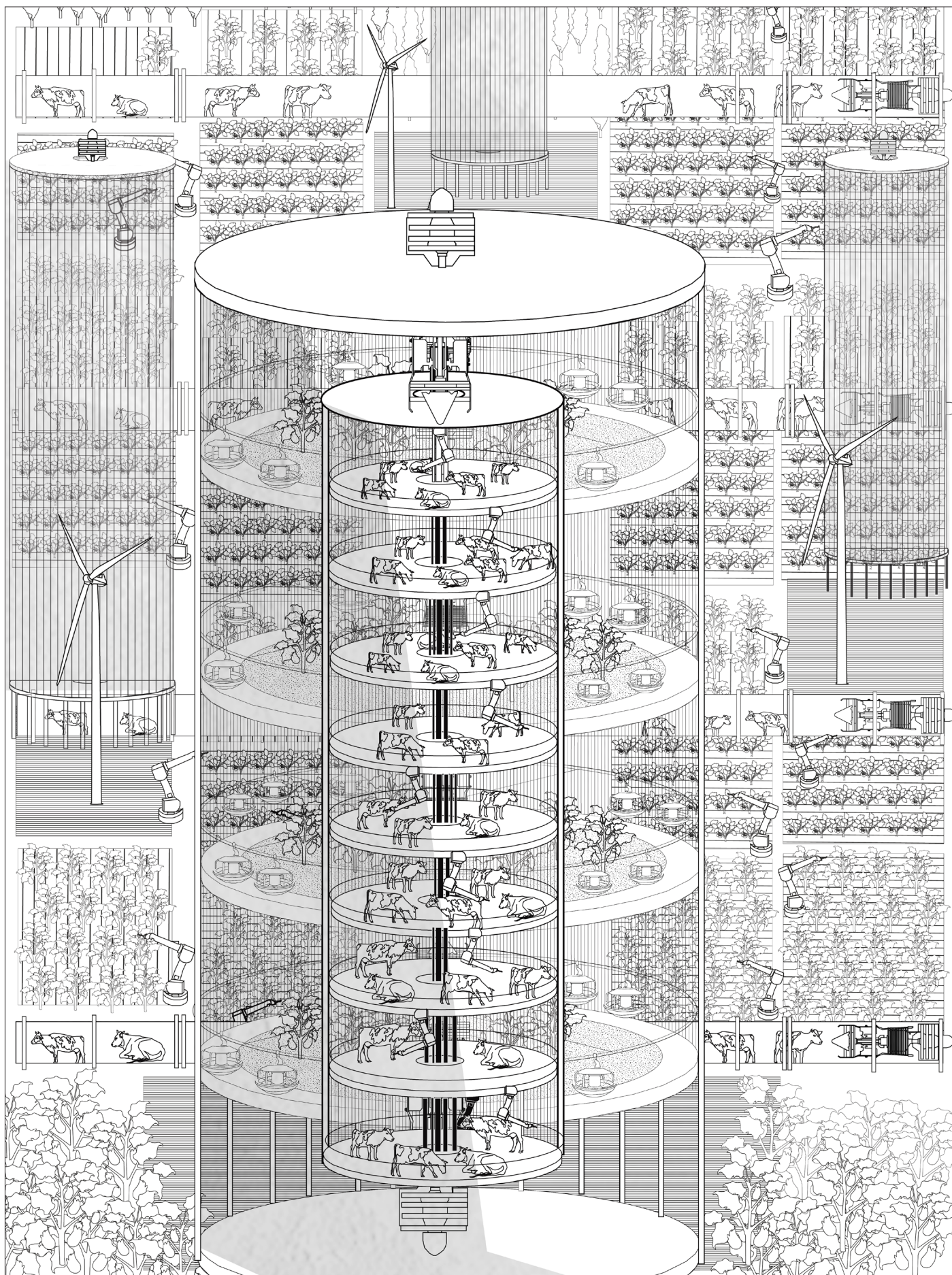
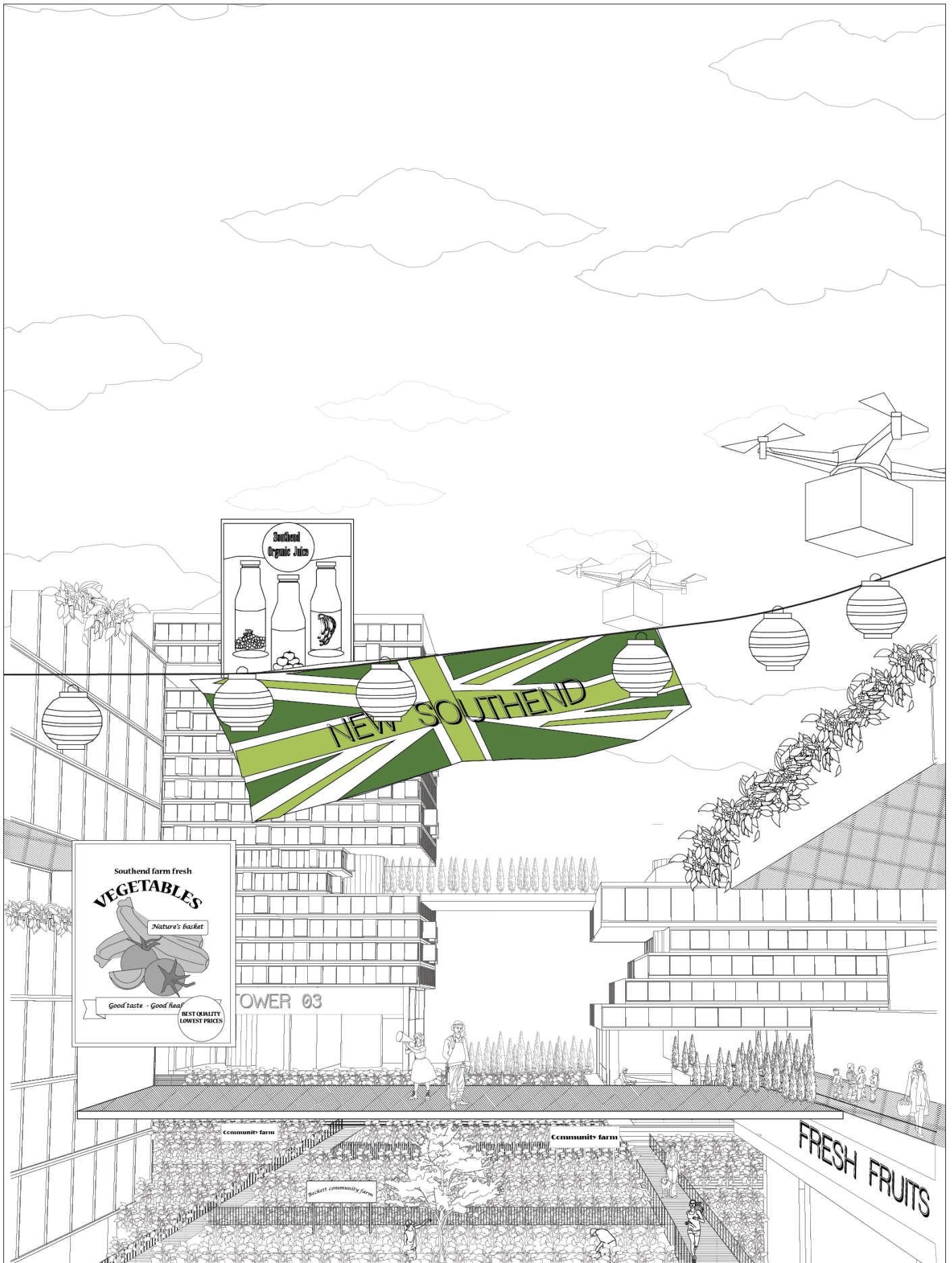
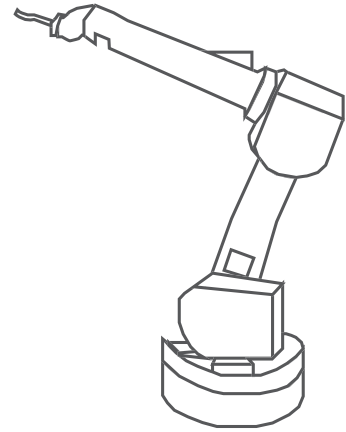


FIGURE : The new city internalizes all animal based farms into highly dense agro towers that can effectively combine both animal farming and commercial food production and will be heavily dependent on technology based labour





Fully mechanised commercial food production

The manual communal farms :

The communal farms will be mainly allowed to grow short duration crops that would require constant upkeep and maintenance making it a highly labour intensive production activity . While the communal farms are under the care of the communities that collectively own the land parcel , the farmers on the other hand will be allowed to grow long duration crops in larger open farms . The main objective is to incentivise organic farming and make it more labour intensive by utilising the opportunity to introduce new agricultural reforms in the post Brexit UK .



Manual labour on communal farms

Part 04 : The port and the changing food economy

Since the new rural city internalizes food production therefore producing , processing and packaging locally grown food. This also opens up the opportunity to re-imagine the function of the port . Since the port already acts as an autonomous unit with a much more relaxed tax and custom duties, the port with the help of all the existing infrastructure connected with it can transform into highly mechanised independent public private farms that can continue to trade with the EU and help fill the gap in the food market that is expected to come after Brexit .

Much like the elements of the industrial city the various infrastructures of the sea can be transformed into new productive units of the independent port farms.

Port of Dover warns of 'regular gridlock' in event of hard Brexit

Port's head of policy says there will be serious congestion without a suitable trade deal



▲ Lorries queue on the M20. Port chiefs said Photograph: Gerry Penny/EPA

The port of Dover has warned week in the town and on surrounding roads in the event of a Brexit deal involving friction

Richard Christian, the port's

Secret government 'ARMAGEDDON' report reveals Brexit will leave Scotland's supermarkets empty

Andrew Learmonth [@andrewlearmonth](#)
Journalist



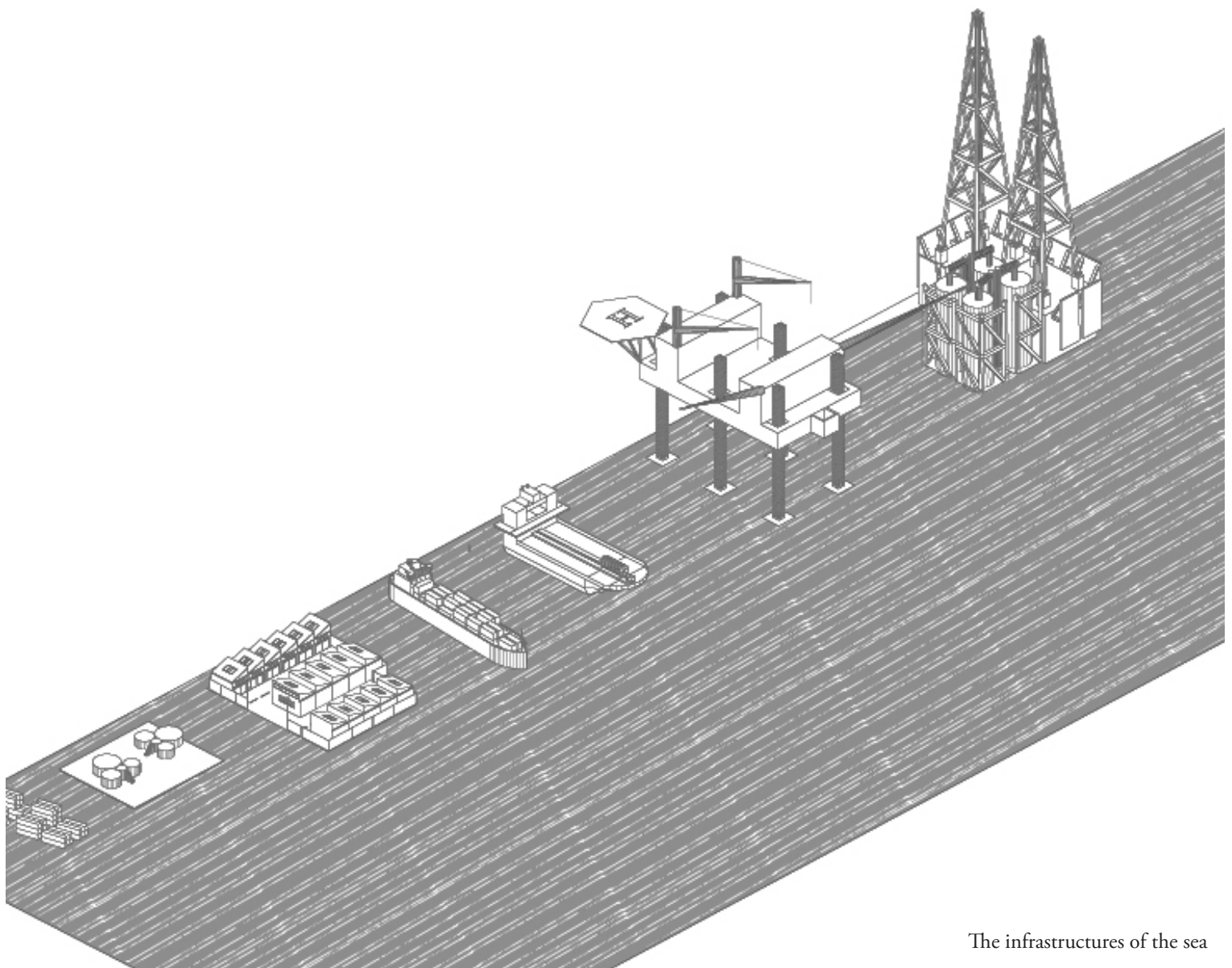
Most popular Most commercial

- 1 Sturgeon vows London (with vision of small nationhood)
- 2 Fame of two halves – the of Messi and Ronaldo
- 3 Tablet producer hits out Tory attempts to 'undermine Scottish produce'
- 4 Blackford urges May to c meeting of party leaders 'dark money' scandals
- 5 Glasgow tells Katie Hopk where to go after refugee

'Armageddon' Brexit: 'No deal' scenario could hit fuel and food

UK officials have warned that leaving the EU with no deal could immediately cripple trade, a newspaper report says. In one scenario, there could be food and fuel shortages within two weeks. And it could be even worse.





The infrastructures of the sea



The port of Dover reimagined as a new territory of production

Appendix

|

Reflection

IV / 05.

Reflection

PART I

Research + design

The complex landscape of the North Sea coupled with its significance as a geopolitical territory makes it a relevant starting point for understanding the imminent issues of the environment from a global perspective. Taking UK as my subject, I began with a broad investigation of its historical, political and territorial expansion while simultaneously tracing the morphological evolution of the North Sea through each stage. This approach provided me with enough evidences regarding the influence of the sea not only on the evolution of UK's geographical and political territory but also globally, as it laid the foundations for an empire that thrived on the use and exploitation of overseas land and resources. The complexity of the site necessitated the need to narrow down the scope of my project to only one of the many elements I identified during the initial mapping phase. I decided to focus on the system of food production within UK for three specific reasons - 1). The food trade and production was fundamental to British trade since the onset of maritime logistics and continues to be one of the most globalized industry's of UK till today. 2). Since the British food industry is heavily import dependent any kind of predicted or unpredicted (global) change in the near future for UK - Brexit, increasing migration, increasing urbanisation, climate change etc. will pose a major threat to the functioning of this industry. Thus making it a crucial factor to be considered in any future urban or policy based model. And lastly, 3). The current methods of production and logistics within UK's food industry are dangerously widespread and unsustainable and have been recorded to have serious environmental impacts globally.

By narrowing down the focus of my research, I was able to recognize how the conjunction of the sea and the land became a departure point for radically new decentralised systems of food - production, manufacturing ,trade and profit. Together these systems have irreversibly altered our modes of living and consumption and till today continue to have serious environmental and economic impacts on a global scale. This globalization of food trade and production also demanded the creation of new urban typologies such as warehouses, rail and shipping docks, barracks, large housing blocks, goods depots, factories, that permanently transformed the fabric of the city and rendered the rural area as a defunct space of production. The increasing industrialisation in the post colonial era compelled the re purposing of land from a space of production to a space of living and manufacturing and prompted a drastic change in the nature of land ownership and liability. Many global events including especially the recessions in 1975, 1982, 1991 and 2009 can be understood as a direct result of this reckless devaluing of land productivity , ownership and accountability. The results of this shift will only become more visible post Brexit when it will become increasingly expensive to feed UK.

This understanding of the North Sea - UK relation and its perceptible impacts both globally and at the urban scale provided the conceptual basis for my project and laid the foundations for my main research question : - *Can a radical redesign of the systems of food production within UK help rehabilitate the 'rural' as the new territory of the self-sufficient living- productive city , so as to be able to subvert the global impacts of its unsustainable food demands in the post Brexit future?*

The research question fed directly into my design, providing me with three clear design aspects - designing for an alternate and more sustainable system of production , designing for the 'rural' with a clear understanding of its urban quality and functioning and lastly designing to monitor and decrease the possible environmental impacts of UK's food consumption. I related each of these aspects with a specific spatial answer (eg - reducing mono cultures, inserting disaster resistant crop and farming types, introducing tech-based farming to increase productivity and re purposing less fertile areas) that I could then insert into the rural fabric to create a new system of living and production.

It was interesting to realize during this process that mapping is a far more intuitive process than I perceived it could be. During this stage I made a conscious effort to detach from a more rational approach of mapping by which I would have represented what is already visual and instead tried to make it more perceptive so that the maps could become a projected representation of what I wished to accomplish from the site. Like any other design project , my research was extremely crucial in providing me with a valid starting point but in many ways this project also made me realize that the process of researching for design is not always absolute ; any material, any data or any form of representation already entails a bias. As an urban designer dealing with a site as complex as the North Sea ,I found myself constantly looking for scientific validation at the beginning of my research phase which limited my ability to realize the full potential of what I could make out of this project. For example, I utilised a huge part of my research trying to map the physical site conditions such as soil types, rainfall , farming type. Although the research was very relevant it did not directly feed into the design. In fact, the understanding of what should be designed and how it can be designed only came after I replaced fact based research with empirical analysis by which the spatial evidences of the globalization of food trade were discernible.

This approach made me understand the change in the urban form of the city as a direct result of industrialisation and decentralisation of food production and highlighted the potential of the defunct rural (countryside) of England to become the new site for a productive landscape. I combined my understanding of the rural landscape of England with the relevant design principles I picked from projects such as - Wright's Broadacre city, Branzi's Agronica and MVRDV's Plant city in Potsdam to test on site a completely new system of 'rural sprawl' combined with production.

The design proposes a new feudal system of land ownership that allows a collective to own 1 hectare of productive land on which they can live and produce. Depending on the current patterns of consumption, I was able to estimate the amount of additional land and the corresponding increase in yield of each crop by the year 2050 when UK's population is projected to increase to 77 million making it the most populated city in Europe. Subsequently, a 1 hectare typology was designed for each crop type including a proposed ideal ground coverage and density (FAR -floor area ratio,) based on the per hectare yield that is required to meet the 2050 consumption demands (See table). The step to create relative values for ground coverage and FAR was crucial since it ensured an equitable access to land, resources and profits and reinforces the importance of collective benefits over individual benefits. The proposed design takes inspiration from the open-field system that existed in rural England until its perpetual decline after the industrialisation of cities. This system allowed the arrangement of agricultural land into scattered strips that were communally regulated but privately owned, but the proposed design tries to take this a step further by combining communal interests with individual rewards. This is achieved by placing a system for FAR subsidies that allows an individual to go vertical and expand the size of his/her dwelling as long as the productivity targets of the 1 hectare collective holdings are achieved.

The end result does not claim to be a definitive solution to the impending food crisis, rather it is a test of whether the revival and appropriation of one of the most archaic systems of land ownership and profit will be able to diminish the perilous consequences of years of consumerism that was a direct result of colonial industrialisation. The design tries to find a balance between individual and collective needs while highlighting the glaring inadequacy of design to find a conclusive answer to a problem that clearly demands a radical revaluation of the present systems of governance and society.

Farming type	Current total yield A	Current per hectare yield B	Projected total yield A X 9	Projected per hectare yield B X 9
	<i>(million tonnes)</i>	<i>(tonnes / hectare)</i>	<i>(million tonnes)</i>	<i>(tonnes / hectare)</i>
Cereals	23	2.5	207	23
General crops	2.4	0.26	22	2.4
Horticulture	3	0.30	28	3.0
Pigs		0.5/ Ha		5.0/ Ha
Lambs		3.8/ Ha		34.5/ Ha
Poultry		20 / Ha		180 / Ha
Cattle / livestock		1 / Ha		10 / Ha
Dairy		0.17 / Ha		1.6 / Ha
Beef		0.2 / Ha		1.9 / Ha

PART 2

Graduation project vs graduation studio

For this year's graduation studio Delta interventions focused on the territory of the North sea encouraging the students to understand the tensions between land and sea as a complex overlap of environmental, political and societal forces that could be addressed collectively or individually. My project delves into this concept by understanding the territorialization of the North sea as a result of the changes on land. Taking the British colonial empire as my departure point, I tried to trace the evolution of the sea, from an unconquerable territory full of unfamiliar sea monsters to a contested territory that is today at the heart of global geopolitics. I found evidences of this changing role of the sea in the dynamic urban form of the city - from the open field system within an agrarian city where social equity and collective sustenance were paramount to an enclosure system within the industrial city where capital gain was more important than collective sustenance and profits . I understood these two systems as an imitation of the hierarchies within nature from a collective co-existence of the land and the sea to the eventual domination of the sea. By proposing a new system of land allocation, production and living, the project tries to highlight the importance of reimagining the city as a design for the collective which has the potential to both embody individual sovereignty and ensure the equitable distribution of public goods. By internalizing the systems of production and distribution within the city the project tries to contest North sea's current role as a facilitator of an unequitable decentralised global trade .

The project provided me with an opportunity to address issues of sustainability via a less explored logic of social equity and justice . Through the design, I was able to explore 1). how urban form could play a crucial role towards a sustainable consumption by overlapping the space required for living, production and distribution, 2). how urban form could promote a sustainable lifestyle by reducing the footprint of intensive farming activities and allowing collective small scale commercial farming of pasture and cattle. and lastly 3). how urban form could facilitate the equitable distribution of common goods using comparable ratios for productive and built land for each crop type to ensure a uniform per hectare consumption. As an urbanist who has to deal with several stakeholders , it was important for me to explore how design can also embody different forms of governance. Furthermore, understanding and designing within a system of collective ownership and common benefits as part of an academic project allowed me to test a complex theory without taking into account the unfavourable outcomes which provided me with an in-depth understanding of the relation between the land and sea that would have otherwise been difficult to explore professionally.

PART 3

Methods

The method of approach for this project can be categorised into three broad steps ; The first step was *Disassembling the site* : Using mapping as a primary tool of investigation the project research began by creating an inventory of maps at two scales. The UK scale to understand historic evolution, territorial expansion, development of ports, waterways and the evolution of the coast. The North Sea scale to analyse geomorphological systems through erosion, accretion and sediment flow studies. The overlaying of maps further helped in establishing certain relational identities and

isolating the various operable systems of the sea and land that were useful to understand the influence of the sea not only on global trade and logistics but also on the morphology of the city. This step reiterates Corners method of re-making territory over and over again where the process of overlaying is crucial to understand the new and diverse consequences of the various systems of the site (2002, pp. 213-215). Overlaying became a method of empirical analysis by which I was able to easily recognize the various multi-scalar interactions between the sea and the land that were able to redirect the influence of the colonial expansion on the fabric of the city. This stage was important to understand the macro-scale especially with respect to the North sea and was useful in mapping the social, economical and ecological processes that informed the spatial patterns of the city.

Following on from this the second step of my method of approach was *Understanding the site components*: This step was extremely crucial in establishing a theoretical framework for my project that not only led me to the project hypothesis but also informed my design considerably. The theoretical framework was guided by an extensive literature review that was useful in tracking the evolving approaches to rural redevelopment, with a special focus on the approach towards agrarianism. While the first phase was useful in de constructing the site the second stage was helpful in identifying the components of the site that could be used for both thematic as well as design exploration of the project. Identifying specific components to work with eg - rural countryside, densities, 1 hectare typologies, grid superimposition etc, were essential to condense the logic of reasoning into speculative strategies that facilitated the design to address collectively the wide range of issues - social, political, environmental and economic identified previously.

Lastly, the final step of my method of approach focused on Re-assembling the site; The first part of reassembling involved identifying a discreet site where the design strategies could be tested, for this I decided to focus on three factors a) farming potential: to identify sites with high to medium grade soil, favourable permeability and suitable rainfall b) Rural risk: to identify the undesignated rural areas that have been included within the future growth plans and c) Urban risk: to identify future urban areas that need urgent rehabilitation due to the impending risk of flooding. Following on from this by combining the analysis done in step 01 with the set of components that were identified and found relevant in step 02, I was able to formulate a set of speculative design strategies that could be translated onto the selected site. Crucial to the process of testing my design strategies on the site was a projected calculation of the land and yield requirements within the selected time frame. This calculation was guided by the scientific data I gathered during the research phase and it eventually served as a very crucial unit of measurement to test the applicability and relevance of the project on the micro as well as the macro scale. A major part of my project was also shaped by the various tools and references that were provided by the graduation studio mentors. While the group work aided the territorial analysis and the thematic exploration within the broader North sea context, a series of master classes on site perception, image making and mapping was useful in developing different methods of 2D and 3D representations.

PART 4

Social, professional and scientific framework

The project tries to visualise a new concept of the city, where new forms of inhabitation and land occupation will be able to augment its resilience and self sufficiency. Since food is a natural derivative of productive land, land becomes a key element of the project narrative. Through the concept of land appropriation the project tries to establish new relationships between natural and man-made systems. By proposing new ways of occupying, owning and utilising land the project tries to redirect the conversation of sustainable living towards the rural. Furthermore, the strategies of urbanisation employed in this project address directly the current shift towards compact cities. Using a systematic sprawl the design tries to highlight the flexibility of a decentralised city to be able to accommodate and respond to future uncertainties without compromising on the sustainable and efficient utilisation of land.

Regarding the question of wider societal relevance the focus on food sufficiency directly relates the project to a much larger global issue. In a time when geopolitical and economic systems are dictating the future of our land and resources, food sufficiency becomes a much larger political debate. Knowing full well that the complexity of this issue is beyond the scope of this project, the design still tries to challenge this multiplicity by developing a counter narrative that puts forward new forms of land appropriation. The project does not want to look at a context specific answer, rather it uses the process of design to identify the best possible tools to reorganize the systems of power at different scales. This allows the design to be universal and adaptable. By tracing the spatial impacts of an industrial economy the project also redirects the current discourse on sustainability by highlighting the importance of social equity as a necessary measure for environmental sustainability and climate resilience.

Lastly, with regard to my own professional development the project was crucial to learn the importance of consistency in both design and research. The complexity of the North sea context brought forth several aspects of research and design that I would have otherwise overlooked as part of an academic project. Furthermore, the process of reducing and /or eliminating information was perhaps one of the most important tools I took away from this project. It made me understand the necessity of spatially visualising and translating every relevant as-

PART 5

Ethical issues and dilemma's

A key focus of the project was to highlight the global impacts of a decentralised food industry with a specific focus on UK's former colonies. In that context it was important that the design always address the issue of food sufficiency from a global perspective, which was not necessarily always in favour of UK. At many points during my research phase this conflict became evident, while my theoretical research reinforced the continued dangers of UK's post-colonial food empire, my site specific research brought forth the various environmental and urban risks that were limiting their productivity. On several occasions I found myself debating between the importance of the intent of the design over the applicability of the design. This was one of the reasons why the design was developed as a replicable model that while addressing the site specific issues within the UK, is also able to be re-appropriated else where. Considering an urbanists profession is becoming increasingly multidisciplinary the possibility of encountering a design project that might have equal and opposite effects on its environment is probable. Therefore, the need for a flexible, replicable design model like the one proposed in this project increases all the more. The designer can no longer be definite, he/she needs to be adaptive and reiterative. Such a prerequisite also needs to be complimented by necessary digital design technologies and complex algorithms that can help rationalize the multitude of climatic and environmental parameters, technical necessities and economic and geopolitical uncertainties.

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