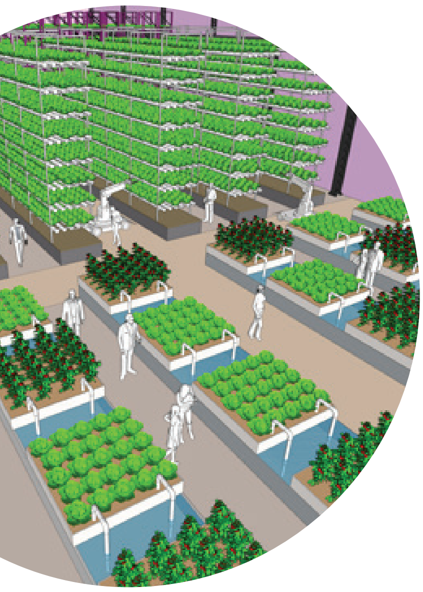
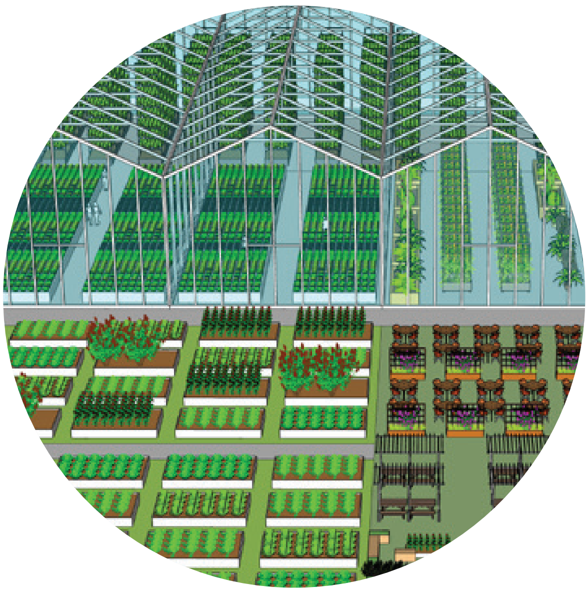
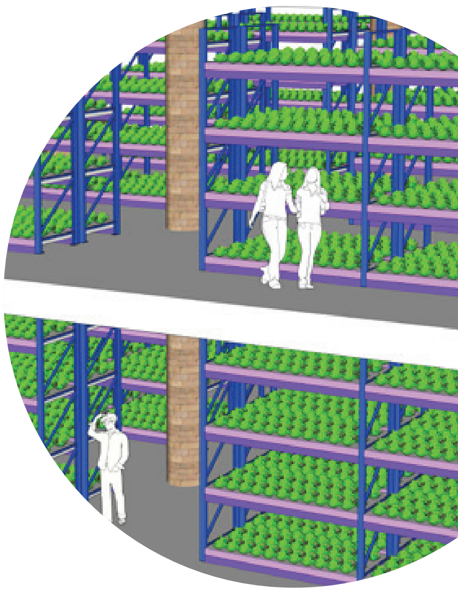
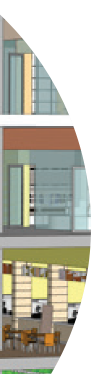
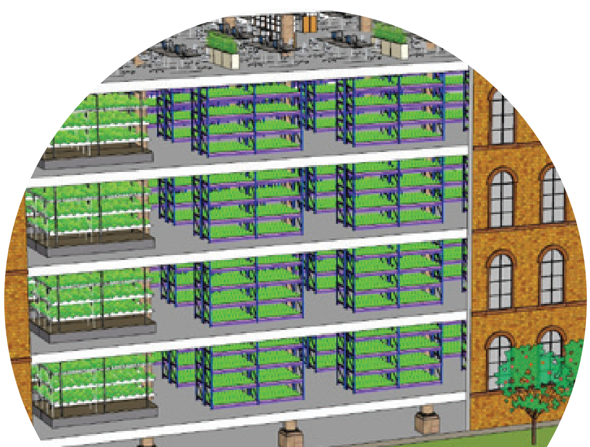
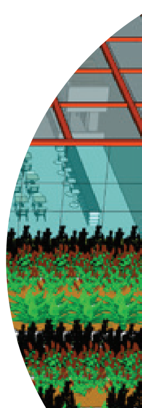
ARUP

Repurposing Buildings for Farming

Retrofitting next-generation agriculture into stranded assets

Foreword

Becci Taylor
Arup building retrofit business leader

This report delivers a refreshing new perspective that purposely looks across conventional boundaries to propose new practical steps toward a sustainable and then a regenerative future.

As building designers, we are firmly focused on how to retrofit and repurpose our existing buildings to reduce their whole life carbon emissions and ensure they meet our future needs. This is an enormous challenge, and to meet our climate targets we must greatly accelerate our action. We need to increase the demand for change as well as build up the industry's ability to deliver it. The scale and pace of change brings the need for more innovation, which requires us to think quite differently from our past experience.

The food system permeates the physical built environment of cities where thriving dense populations need healthy fresh food delivered continuously. While the impact of each individually is increasingly well understood, they have been kept quite distinct.

This work brings these systems together – fusing difficult-to-use (or "stranded") existing buildings with the opportunity of urban farming. This enables new solutions to some of our greatest challenges. By targeting new use cases for the assets that we have, we can reduce carbon emissions and waste, regenerate neighbourhoods, provide jobs, and enhance resilience. Moving food production into the urban realm frees up land and water resources for other essential purposes such as biodiversity.

As you read this report, I encourage you to embrace the potential that arises from breaking disciplinary and industry boundaries, imagining new and integrated approaches to tackle our planetary challenges.

It is essential to pilot these initiatives now, allowing us to test and refine strategies to develop credible and scalable solutions.

Eike Sindlinger
Arup food & agriculture business leader

We are living through an extraordinary time of change and challenges as the impact of climate change can be acutely felt. Wetter winters and hotter summers highlight that weather patterns have become less predictable. This makes open-field food growing more challenging and leads to reduced yields.

Adding to this is the impact of conflict, expressed in rising energy and fertiliser costs. After putting reduced yields and higher input costs together, it is easy to understand the cause of soaring food prices driving inflation and growing food insecurity. In response, we see rising interest in growing food in fully controlled environments, de-coupled from climate uncertainty, entirely pesticide-free and with minimal use of fertilisers.

Alongside the challenges in the food sector, the recent pandemic has reshaped how we interact, work and shop. This has rendered many buildings obsolete. While some can be converted to new use with relative ease, others are struggling as they can no longer meet current or future environmental standards, user expectations and requirements. These structures are at risk of becoming stranded assets, with a significant amount of embedded carbon that we cannot afford to discard.

What if we looked at those two trends together and explored the potential of the next generation of food growing technology as a new use for obsolete buildings? We collaborated with entrepreneurs from the agri-tech industry to examine the opportunities and understand the challenges. The answers are of course never straightforward. But we found the potential to be significant. We hope this report will inspire asset owners, investors, designers and authorities alike to imagine new approaches to regeneration through vertical farming. Our findings might just be the first steps towards exploring the true potential of using leading edge farming technology to breathe new life into existing, sometimes much-loved, structures.

One aspect that is becoming increasingly important and relevant is the significant value that locally grown produce can have in enriching the fabric of local communities.

Hamish Grant
Chief Growth Officer, Square Mile Farms

Executive summary

This document explores some of the immediate and future opportunities to integrate next-generation food-growing technology into stranded assets within the built environment.

Such an approach has the potential to deliver the following benefits:

– Regeneration of much loved structural assets that would otherwise remain empty, and subsequent rejuvenation of the surrounding urban area.

– Localisation of a reliable source of edible produce that delivers fresher food to consumers, whilst reducing the food miles and associated pollution and need for refrigeration.

– Provision of employment opportunities in an urban context for the next generation of farmers, and for other businesses associated with the regenerated asset.

– Creation of a new destination for tourists and the local community, around food production and food culture.

This document shows four tangible scenarios for how disused buildings can be retrofitted for urban farming, commercial food production, and associated community-positive activities.

Such a project is technically feasible, and has the potential to give a new life to currently disused buildings. As well as being a source of commercial profit, an asset regenerated in this way offers associated benefits for preserving our built heritage, reducing construction emissions, and making the food system more efficient and closer to consumers.

Context

The growing challenge of stranded assets

A stranded asset is defined as any unused or underutilised structure in the built environment. These structures represent great potential for reuse, without expending much additional carbon, given that embodied carbon was already locked into the structures during their original construction.

Any typical city in 2023 will contain a range of stranded assets (either entire buildings or parts of buildings) of various structural typologies. It is worth considering how many of these stranded assets within any urban area could be transformed into something new, and therefore provide social, economic, cultural and environmental value to the local area. Solutions involving the retrofit of next-generation agriculture technology into stranded assets could be appropriate in many cases.

The number of unused buildings (stranded assets) in the UK has increased in recent decades due to the decline of industry,[1] the transition to low carbon energy generation,[2] inadequate maintenance by asset owners,[3] and the recent pandemic, which accelerated the rise of online retail,[4] and increased the number of people working from home.[5]

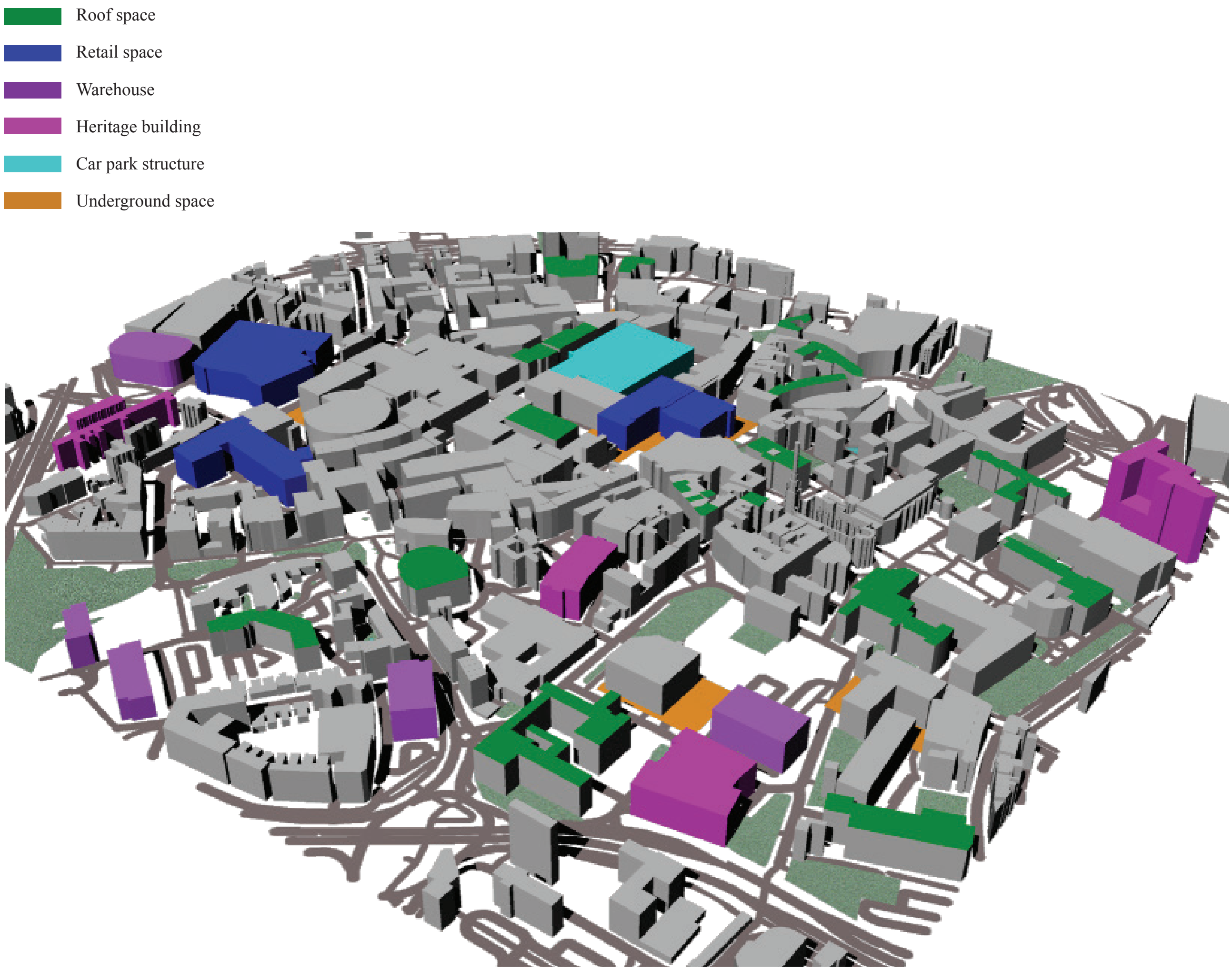


Fig. 1: A schematic of a typical city, showing opportunities for redevelopment of currently stranded assets.

In addition, 87% of today's commercial office spaces do not meet 2030 environmental requirements and are therefore at risk of becoming stranded assets.[6]

Taking London as an example, there has been a large increase in vacant buildings between 2020 and 2022.[7] These "dead spaces" represent an abundance of existing assets that could be repurposed into facilities that provide a benefit to society and organisations, without consuming significant materials and resources.[8]

The built environment is responsible for 39% of the world's CO_2 emissions, of which 28% is operational emissions, and 11% is from materials/construction.[9] A chunk of these emissions could be avoided if due consideration is given to opportunities for repurposing structures, ahead of demolition and re-build. A 1970s commercial office retrofitted with heat pumps would take up to 220 years to exceed the construction carbon emissions of an equivalent new build.[10]

This represents a significant opportunity for asset owners, local authorities and designers to come up with new innovative ideas for re-use of our existing building stock.

39%

of global CO_2 emissions are due to built environments.

87%

of UK commercial offices today don't meet 2030 environmental requirements.

220

years for a retrofitted office to exceed the construction carbon emissions of an equivalent new build.

Fig. 2: Using London's council-owned building stock as an example to illustrate the potential for giving structures a new life.[8]

Pressure points of the global food system

Our global food system faces multiple pressures. A growing global population combined with changing diets has driven a rise in demand for food.[11]

Land use

There has been an eight-fold increase in global human population during the past 300 years, and this has driven huge land use change mainly through agriculture – an increase from ~10% to ~50% of the Earth's habitable land area being used for agriculture during this period.[12,13]

This has come about at the expense of taking that additional 40% of land away from nature, including widespread deforestation, destruction of habitats, and displacement of countless species of animal, some to the point of extinction. In recent years, agricultural land use appears to have peaked. However, global cropland is still increasing; most evidentially in tropical climates, historically carbon sinks with rich biodiversity.[14] Over the past 50 years, land use for agriculture has been the key driver of biodiversity loss.[12]

The agricultural land use breakdown is 77% for livestock (grazing animals, and growing the crops to feed them), with crops grown for humans accounting for the remaining 23%.

Technologies demonstrated in this document point to the potential for crop growing to occur indoors on a much smaller footprint, and for livestock to be replaced with indoor cultured meat production on a likewise significantly reduced plot of land. In 2019, the IPCC estimated the agricultural sector to be responsible for between 21% to 37% of global greenhouse gas emissions.[15]

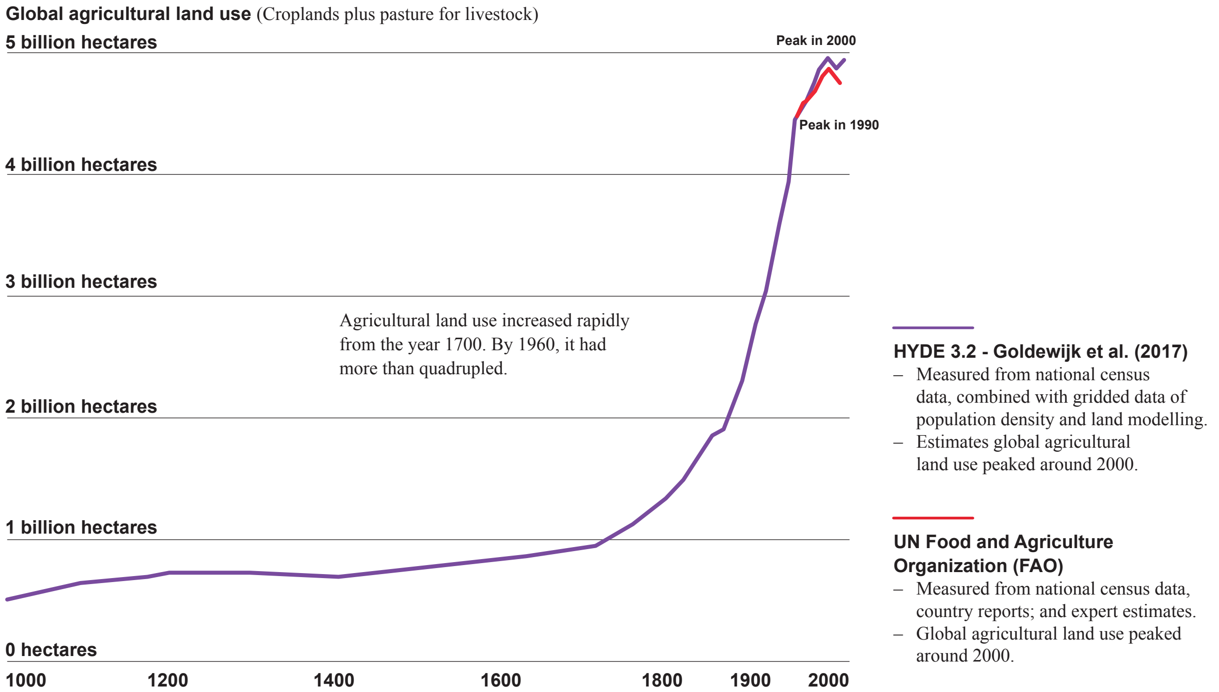


Fig. 3: Curve showing the rapid increase in global agricultural land use over the past 1000 years, being a primary reason for biodiversity loss over the same period of time.[13]

These emissions are a key contributing factor to climate change, and its associated impacts.[16] With increased temperatures expected to be another key change, increased land desertification is expected to adversely impact harvests, and may ultimately cause food shortages. In response, even more natural habitats are under pressure to be converted to farmland, greatly increasing competition for land use. Apart from food, we need land for new development, energy production, flood management and infrastructure. At the same time, the world has agreed to reserve 30% of the planet's land mass for nature,[17] recognising how important nature is for our survival. To allow nature to recover, we need to significantly reduce the amount of land used for agriculture.

50%
of the earth's habitable land is used for agriculture

80%
of food is grown in rural areas

70%
of food is consumed in cities

30%
of all food grown is wasted prior to consumption

Chemical pollution

Conventional field-based agriculture is responsible for significant pollution of soils and water systems due to the chemical run-off which comes from using pesticides and fertilisers.

Pesticides are used to protect crops from disease and parasites. In a controlled indoor environment, they are not required.

Food waste

We already produce enough food to feed 10 billion people every year, however over 30% of all food is wasted (equivalent to 38% of total energy used in the global food system).[18] This is food which is grown, transported, and sold up the supply chain, but is ultimately left to rot before anybody eats it.

Not using harmful pesticides means vegetables can be packaged without washing, increasing their shelf life. Additionally, farming closer to the consumer means food produce spends less time on the road and at a distribution hub. It gets to the customer quicker and can last longer, reducing food waste.

Supply chains

Events such as the recent pandemic and international military conflicts have highlighted the vulnerabilities of the long supply chains that our global food system has developed.[19] This is leading to increased interest in "on-shoring" – the idea of growing food closer to the consumer.[20]

In response to these many concerns, scientists and innovators are developing the next generation of food production facilities, which are discussed next.

The future of food production

To make food production more predictable, less weather dependent, and more land/water efficient, scientists and entrepreneurs have developed a range of high-tech food growing technologies. These can broadly be classified into the following three time-horizons:

Now: High-tech greenhouses.[21]

A modern greenhouse uses advanced technology to better control growing conditions to optimise plant growth and at the same time keep unwanted pests and parasites at bay. While still mainly powered and lit by the sun, it typically uses additional artificial lighting, heating or air conditioning to extend the growing season. This technology is well understood and widely used commercially, even though their integration with existing buildings including on rooftops is less common at present. However modern greenhouses require a lot more land compared to the technologies described under New and Next for producing a similar amount of food.

New: Vertical farming.[21]

Vertical farming is the most prevalent form of Controlled Environment Agriculture (CEA), where food growing happens on vertically-stacked shelves. It is a technology-based approach to indoor farming where all environmental conditions, including light, are fully controlled in an enclosed environment.These technologies have been evolving over the past decade, with lots of commercially operated facilities. The food produce itself is conventional and does not require additional licenses for market access.

Next: Cultured meat.[21]

Also known as precision fermentation or cultivated protein, cultured meat is grown from animal cells in laboratory conditions, rather than being grown on an animal. These technologies are pioneering and the food that they produce is new, requiring licenses to be sold in the market. Research into cultured plant cells is also currently being undertaken, with significant potential for crops such as coffee and cacao.[22] While there is a lot of promise and excitement for these products, widespread market acceptance is likely a few years away.

The Now and the New

The four scenarios shown later in this document focus on the now and the new.

Now: High-tech greenhouses

Primary Benefits

High-tech greenhouses can produce consistent and reliable crops all year-round. This is because they produce crops under controlled conditions, with external factors such as weather conditions having less of an impact. There is significantly less dependence on external seasonality, unlike with field-based agriculture.

High-tech greenhouses can provide food production for local communities in areas where traditional agriculture may be challenging. This can help to increase food security in urban areas, or in areas with extreme climates.

The environmental impact of agriculture can also be reduced by deploying high-tech greenhouses. A well-designed facility will have environmental advantages compared to field-based agriculture and low-tech greenhouses. They tend to use less water, fewer pesticides, and having a closed-loop system where nutrients are recycled helps prevent pollution of soils and waterways.[23]

The use of advanced technology and automation in high-tech greenhouses can result in increased efficiency and significantly higher yields per unit area of land compared to traditional greenhouses and field-based agriculture. The majority of growing energy is typically obtained from sunlight, with LEDs only used to prelong the "daylight hours" or provide a specific spectrum of light.

Consistent and reliable crop production

Low risk to polluting soils and waterways

High efficiency and potential for automation

Primary Challenges

Greenhouses still occupy a large amount of land. While they are more land-efficient compared to field-based farming, they are more land hungry than vertical farming. In addition, they need sites that are very flat. This can be challenging as a typical modern greenhouse is around 8ha and can be as large as 20ha.

Another downside of using direct sunlight for growing is that most facilities are limited to flat growing beds (i.e., no vertically-stacked layers), and solar intensity from day-to-day will vary, removing some level of control from the growing process.

The up-front cost of building high-tech greenhouses can be high compared to field-based farming, making it a barrier to entry for some farmers and businesses. The heavy reliance on technology can be complex and costly to maintain. Technical failures or malfunctions can result in significant crop losses.

Requirement for large areas of flat land with consistent sunlight

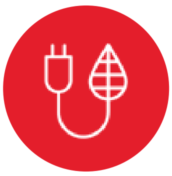
Cost of construction, maintenance and labour

New: Vertical farming

Very efficient in terms of land use and water use

Better control over yield, flavour and nutrition

Eliminated risk to polluting soils and waterways



Energy consumption to enable control of indoor environments

Commercial viability and limited range of food types

Primary Benefits

Vertical farming enables higher crop yields per hectare, as produce can be grown in vertically stacked layers. Typically, by stacking in 10 layers, it can use up to 90% less water and land.[24]

High and consistent yields are available all year due to the controlled nature of the farm. A typical yield of leafy crop can be as high as 80 - 120kg per year, for every square metre footprint of a vertical farm with 10 vertical layers.[25]

Plants grown in a fully controlled environment means that they are not exposed to adverse weather events. The significantly higher yields compared to field farming allows the growing of more food domestically which reduces vulnerability to political and market instabilities that longer global supply chains may be exposed to.

Precise control is possible across all inputs (lighting, water, nutrients etc), and environmental conditions (temperature, humidity, airflow etc).[24] These factors form the crop's "recipe", to control the taste, texture, and appearance of the crops.

The growing method rarely involves soil – it is typically hydroponic or aeroponic. No use of pesticides or herbicides is necessary, and hence no chemical run-off into the natural environment.[26] Produce can be packaged without washing. Combined with reduced food miles this can lead to a longer shelf life and creates less food waste.

There is potential for automation when operating at commercial scale, such as robotics to move the growing trays, and sensors with feedback control. Together with the controlling of the environment, this can make outputs very predictable.

Primary Challenges

The biggest challenge is energy consumption (and volatile energy prices) to power equipment. Energy impact can be reduced by integration of farms with local renewable energy sources, avoiding peaks in daily energy costs, and acquisition of waste heat from adjacent businesses.[27]

The quantity of produce grown on large-scale vertical farms can be a distribution challenge in large, congested cities. The largest vertical farms (e.g., larger than 2000m^2 growing area) are often best located on the outskirts of cities – at transport hubs or co-located with supermarket distribution centres.

Commercial viability will depend on many factors including location, market demand, and energy cost. As production can be more expensive compared to open field farming, success may depend on the value customers place on reliable supply, consistent quality, and flavour.

Next: Cultured meat

Primary Benefits

Cultured meat allows for an ethical process by which to produce ever increasing volumes of meat to feed our growing global population.

Many humans love the taste and texture of meat. Cultured meat achieves the same taste alongside significant animal welfare benefits, with an animal only needed for cell extraction but no forced breeding and slaughter for meat.

Unlike traditional livestock farming, cultured meat can be fine-tuned to control the fat, cholesterol, fibre and nutrient content. The way it is grown does not require anitbiotics therefore it does not contribute to antibiotic resistance amongst humans.

Environmental numbers are dependent on the meat being replicated but typically perform better compared to livestock meats across several key metrics as tabulated below.[28,29] Land use and water use are significantly reduced compared to equivalent livestock farming.

	Study	Cultured meat	Equivalent livestock (multiplying factors compared to cultured meat)		
			Poultry	Pork	Beef
Land use	2022	1.0	x 2.7	x 3.6	x 20
Water use	2011	1.0	x 5.5	x 9.3	x 25
CO_{2equiv} emissions	2022	1.0	x 1.2	x 2.1	x 12.5
Energy use	2022	1.0	x 1.0	x 1.1	x 1.8

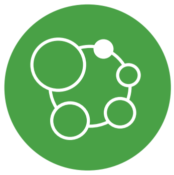
Table 1: Comparison across several key metrics between cultured meat technology (baseline = 1.0) and equivalent livestock farming (the green cells are the best performing methods according to each metric).[28,29]

Primary Challenges

One technical challenge of cultured meat is for safe reuse of the waste products, with the process also requiring inputs such as sugar to feed the cells (e.g., from corn, which requires land use). Net benefits are likely if the land freed up from livestock is used for carbon storage.[30] Cultured meat is a new technology, and currently has regulatory approval for general consumption in Singapore, the USA, and the Netherlands, as of summer 2023.

Commercial viability of the technology will come once large-scale production is approved, and once consumer acceptance of the technology is sufficient, with early polls showing a 57% willingness to try in the US.[31,32]

Control over fat, cholesterol, fibre and nutrient content.



Meeting the increased demand for meat without the need for farmed animals

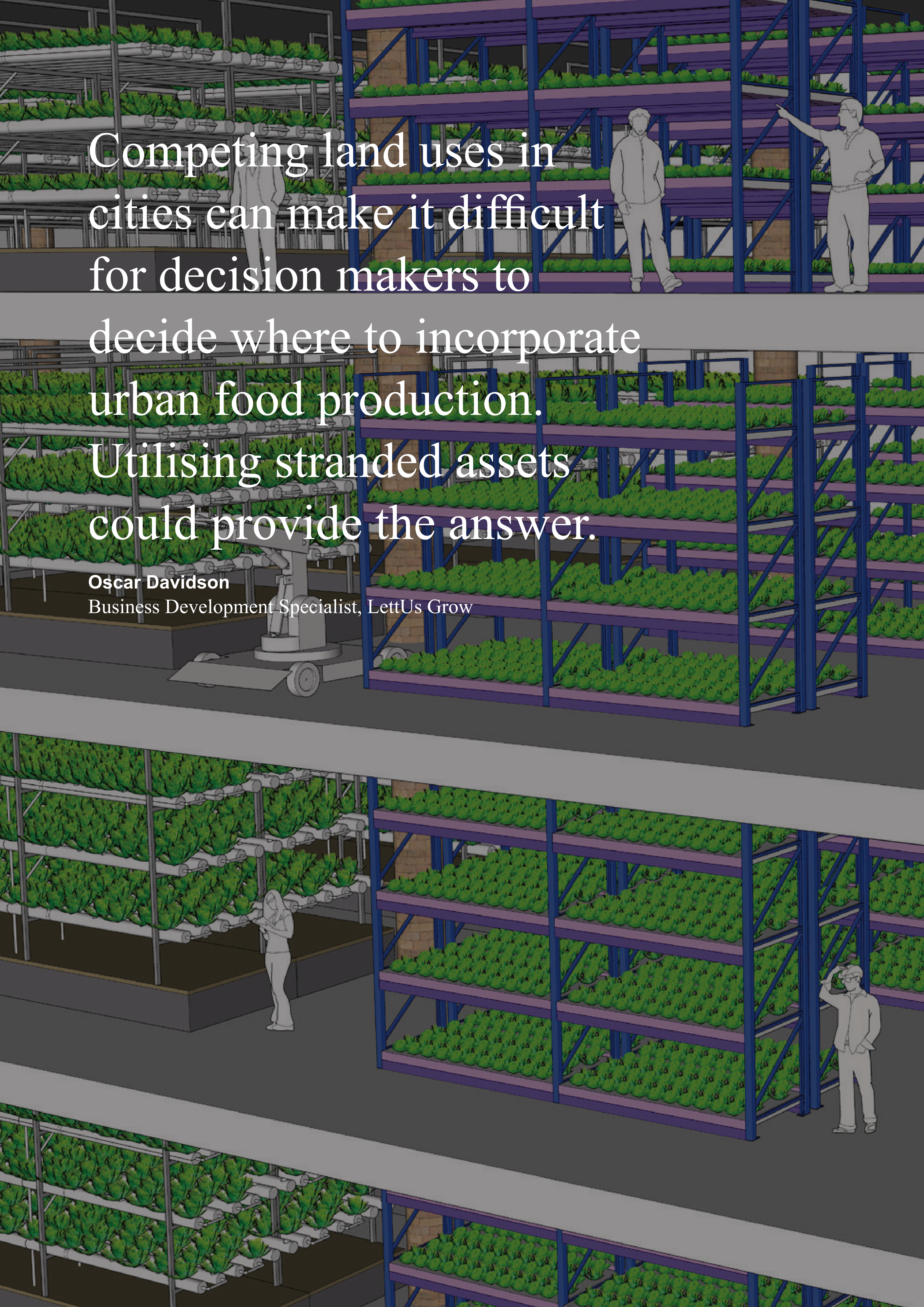
Very efficient in terms of land use and water use

Reuse of waste products from the growing process

Regulatory and consumer approval of new technologies

Competing land uses in cities can make it difficult for decision makers to decide where to incorporate urban food production. Utilising stranded assets could provide the answer.

Oscar Davidson
Business Development Specialist, LettUs Grow



Exploration

The most appropriate solution for transforming a stranded asset into a food-growing facility will depend on the outcomes of a feasibility assessment. The assessment would consider the physical condition and connectivity of the asset, and its potential in the context of its geographic location.

Four broad solution categories have been identified and are shown below. They represent four different approaches to retrofit, depending on the specific conditions of the building and the site.

Each solution is explored in the following pages, using research outcomes, case studies, and indicative architectural models with annotations.

1 **Food growing as the primary function**

2 **Food growing as the regeneration anchor**

3 **Food growing as a supporting function**

4 **Food growing as the catalyst to regenerate and showcase heritage**

1 Food growing as the primary function

A building where all activity is dedicated to commercial vertical farming and associated tasks. A suitable structure might be a disused warehouse.

Insights

- Commercial facilities suitable for large building footprints.
- Large floor-to-ceiling height allows for more growing layers per m^2 of building, but increases complexity in terms of access and temperature uniformity.
- Ideal for well-insulated spaces without access to daylight which could interfere with fully controlling environment.
- Typical produce are leafy vegetables such as herbs and salads.
- Commercial unit can have a significant daily output, requiring good access and space for logistics and vehicle movements.
- Proximity to a large distribution centre can be more advantageous than being in an urban centre.
- As energy is the biggest operational cost, access to sufficient energy at affordable cost or an integrated energy strategy are important success factors.

Real-world example
Agricola Moderna, Italy[33]

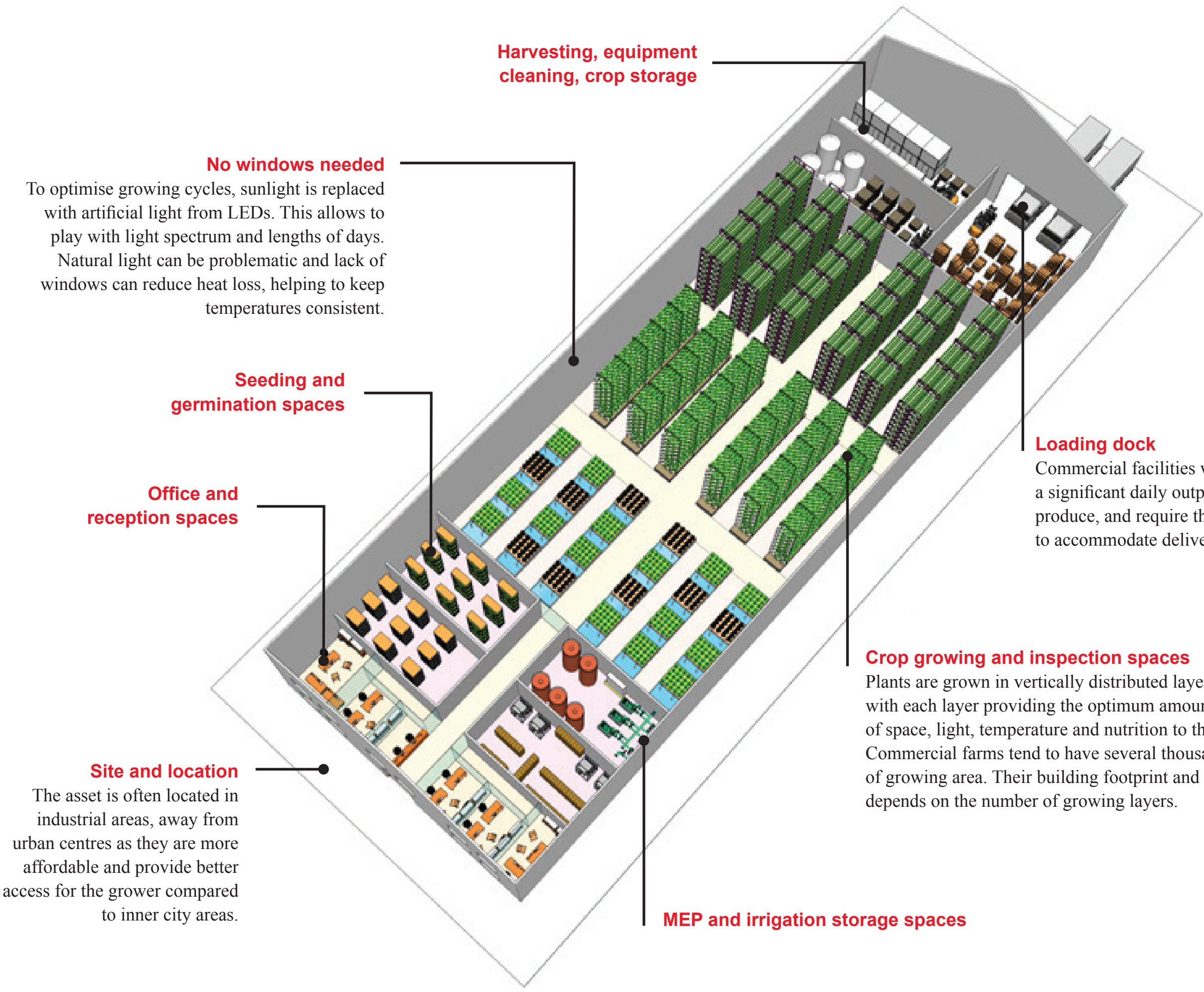


Fig. 4: Illustrative view of a disused warehouse, where food growing is now the primary function. © Arup

Automation
Seeding, shelf stacking, harvesting, and equipment cleaning can be achieved manually or at scale with robotic assistance. © Arup

Reliable production
The input/output logistics, crop handling, storage, and food safety are all controlled. © Arup

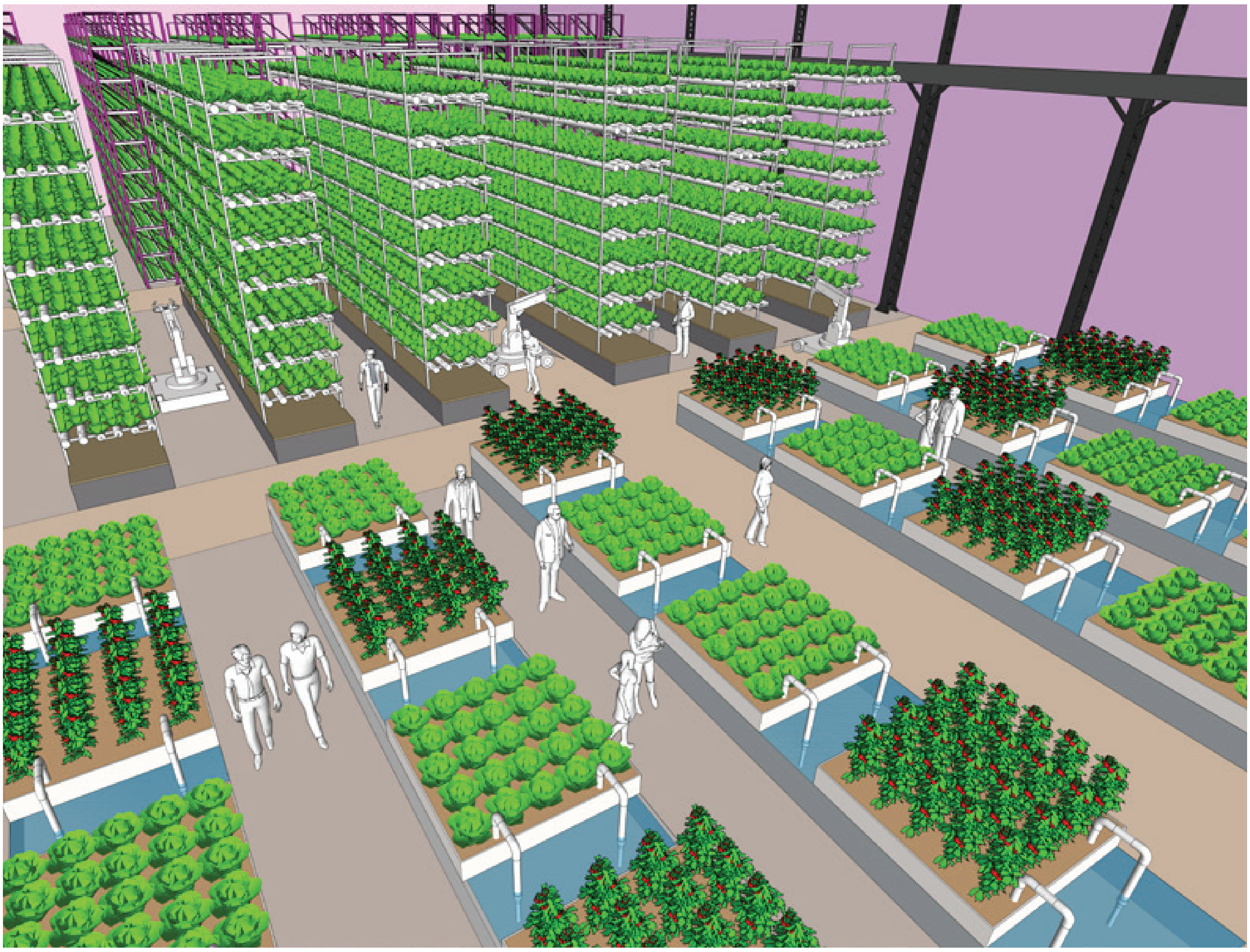


Fig. 5: Illustrative view of the crop growing space, noting the potential for crop variety, dense vertical growing, automation, and efficient logistics. © Arup

2 Food growing as the regeneration anchor

A building where the presence of a vertical farm complements other uses such as restaurants and retail, and becomes an attraction and generator of consumer footfall. A suitable structure might be a disused department store, especially one with underground space or an indoor car park.

Insights

- Food growing not the main and sole activity within the stranded asset, but a complementary activity to other uses.
- Could be part of the branding and identity of the re-development.
- Facility might be smaller than for a warehouse-based commercial farm.
- Operator might be focussed on specialty produce and a more localised market rather than mass production and in earlier stage of the development of their technology.
- Large loading docks, basements or carparks related to department stores of retail parks might be suitable.

Real-world example
The Plant Chicago.[34]
One third of the building used for vertical farming.

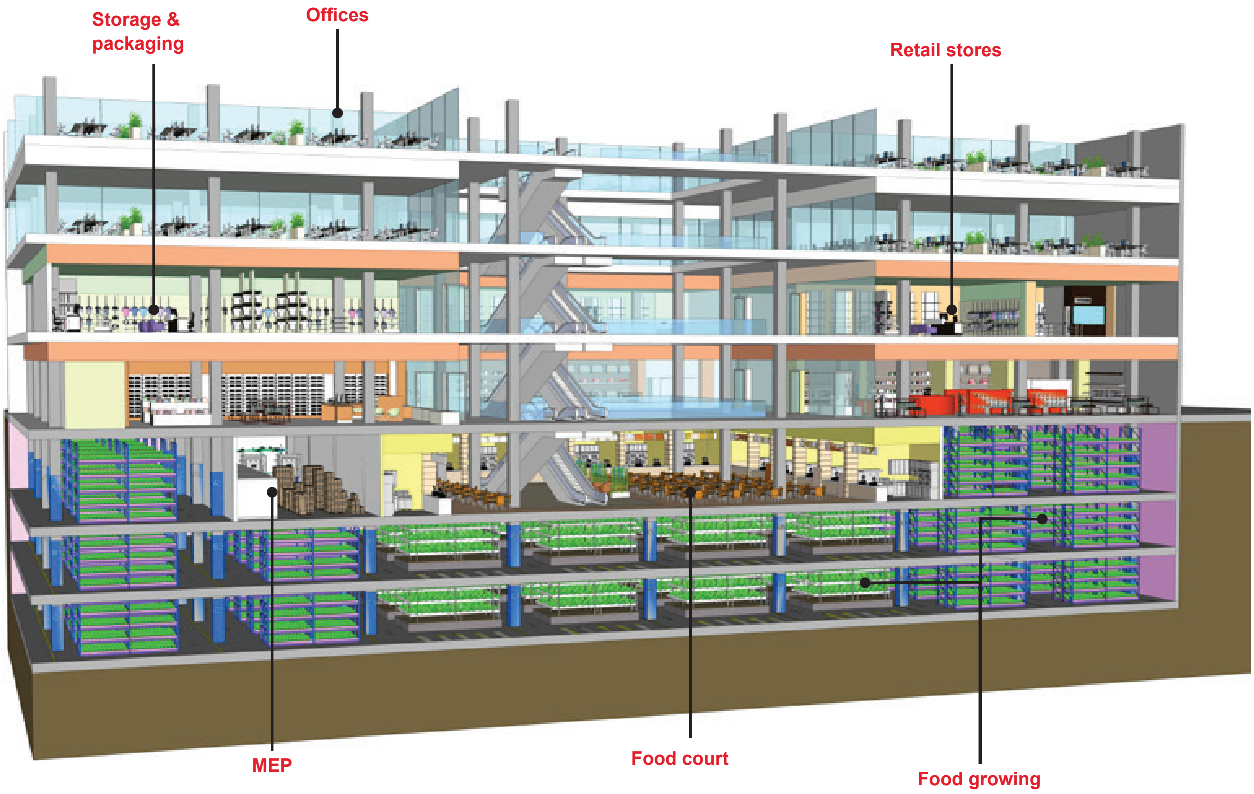


Fig. 6: Illustrative view of the retrofit of a disused department store, where food growing becomes the anchor for regeneration. © Arup

Fig. 7: Illustrative view of a retrofit department store, with public retail spaces above and vertical farming spaces below. © Arup

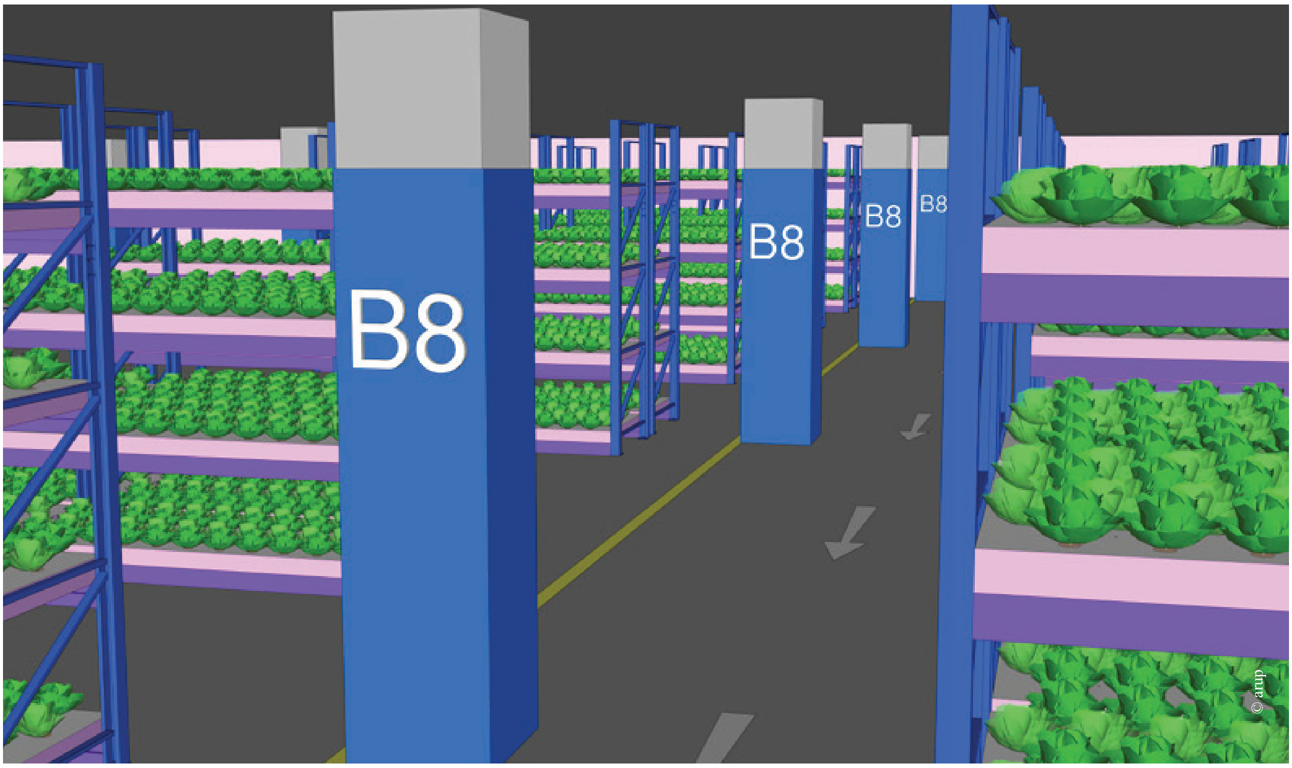


Fig. 8: Illustrative view of the basement car park repurposed for vertical farming. © Arup

3 Food growing as a supporting function

A building where a greenhouse or rooftop farm is integrated into the overall structural design. A suitable structure might be a disused rooftop above an otherwise occupied building, or an underused top level of a multi-storey car park.

Insights

– Both raised beds and enclosed greenhouses are feasible.

– Can be combined with ancillary uses such as a café, meeting rooms or community facilities.

– Can provide benefits of wellbeing for building occupants and visitors.

– Ensure location and orientation provide sufficient access to daylight.

– Good access, structural capacity to bear additional load and ability to ensure integrity of water tightness are key.

– Depending on size and access arrangements, this might work for both enterprises with a commercial or social focus.

Real-world examples

Acre Farm and Eatery[35]
Integrated hydroponic rooftop glasshouse and additional 2,500m^2 rooftop garden, in Burwood Brickworks shopping centre, Melbourne, Australia.

Colorado University[36]
Coupled the rooftop farm with solar panels to create an agri-voltaics business model.

Vyse Street car park[37]
A proposal which gained 2023 approval in Birmingham, UK.

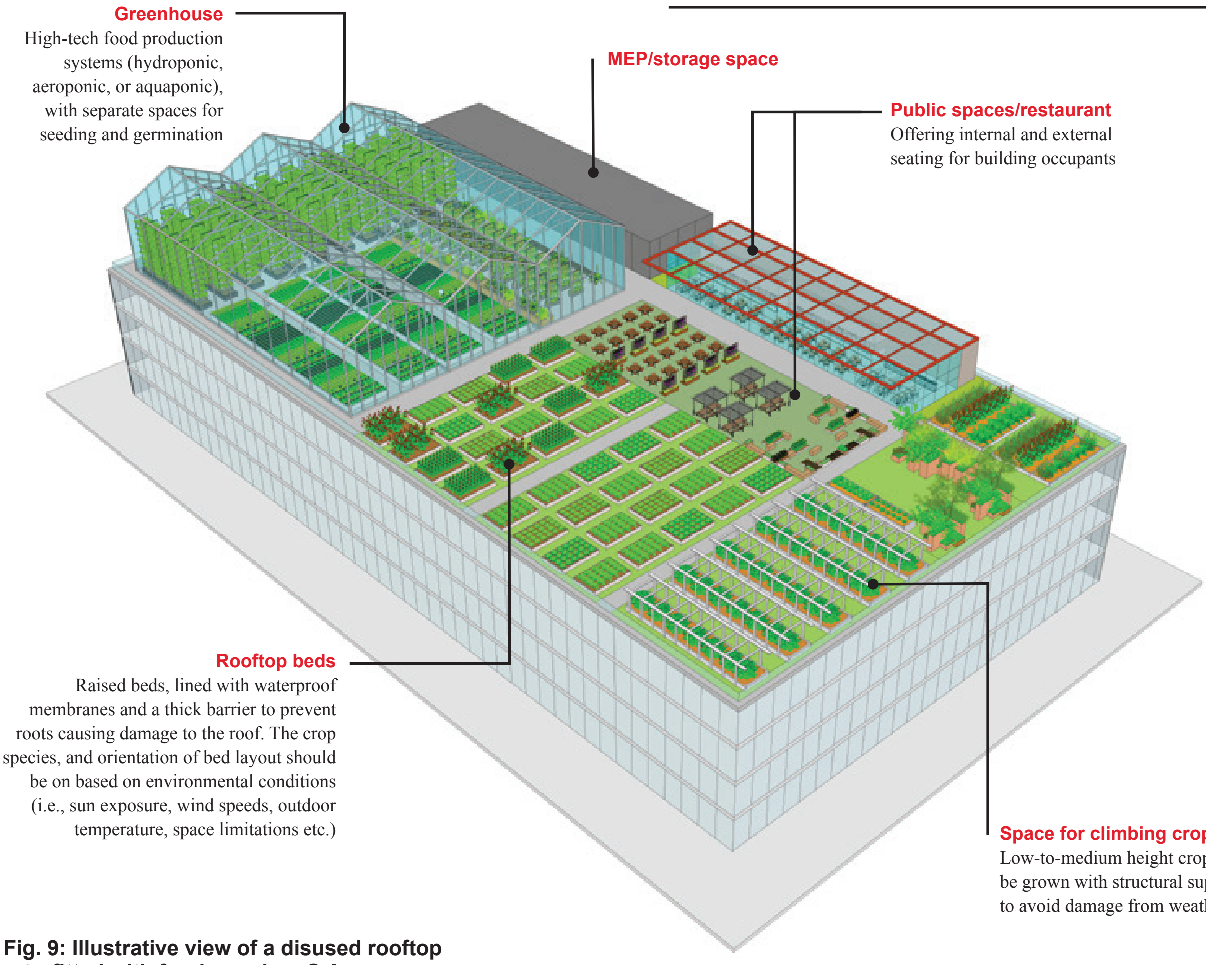


Fig. 9: Illustrative view of a disused rooftop retrofitted with food growing. © Arup

Fig. 10: Illustrative view of food production within the rooftop greenhouse of a building. © Arup

Fig. 11: Illustrative view of a rooftop café next to the growing space. © Arup

Fig. 12: Illustrative view of the rooftop serving as accessible green space with food growing. © Arup

4 Food growing as the catalyst to regenerate and showcase heritage

A building where the regeneration project associates food growing with community-related activities, providing wider business and social benefits. A suitable structure might be a disused industrial building such as a listed mill or factory.

Insights

– Listed buildings with sufficient space can be an attractive proposition for a commercial operator.

– The landmark nature of listed buildings lends itself to provide other community / food related functions.

– Listing and the ability to add / adapt elements are important considerations, as are the condition of the building, its location and context.

– Retrofitting a listed building is likely to be more expensive than a purpose-built new farm with operational penalties.

– Exploring the potential to deliver wider benefits can help unlock funding to cover the cost premium.

– Unique branding and creating a destination can outweigh additional operational costs.

– The combination of history, culture, location, and integration with the surrounding community are the keys to success.

Real-world example
Greens for Good/Farm Urban (Liverpool)[38]

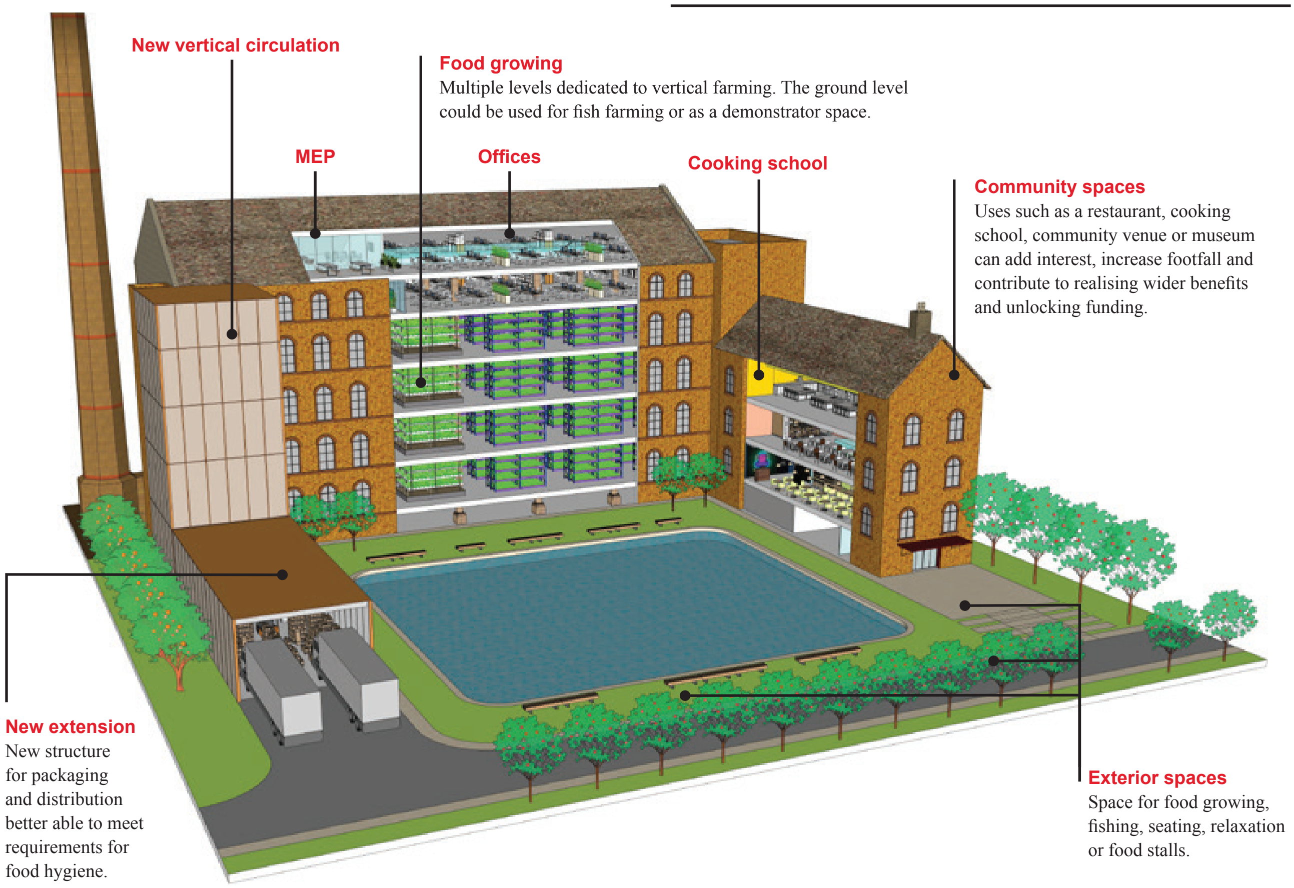


Fig. 13: Illustrative view of a disused mill with food growing as the catalyst for regeneration, and a key part of showcasing the building's heritage. © Arup

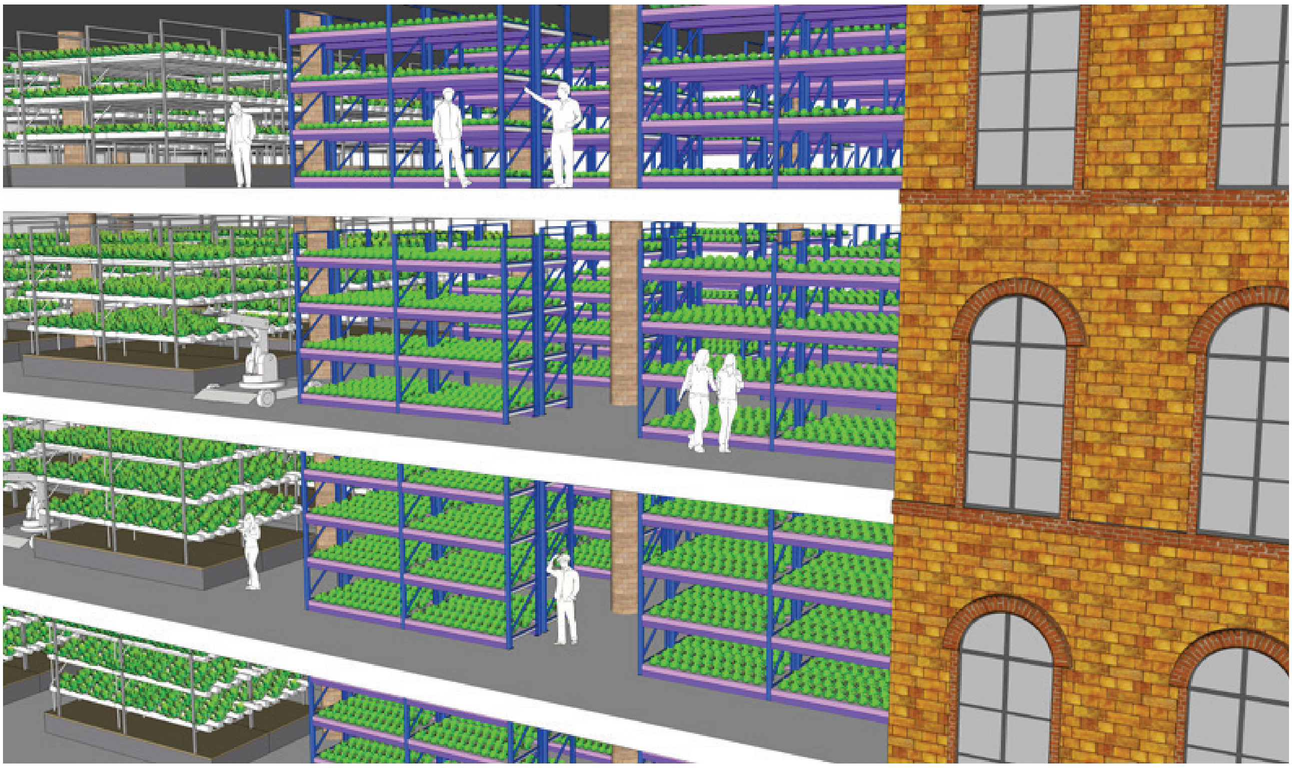


Fig. 14: Illustrative view of food growing within the constraints of a former industrial heritage building. © Arup

Fig. 15: Illustrative view of complementing functionality from community activities such as restaurant, museum, cooking school, retail, and community facilities. © Arup

Fig. 16: A former shipping container fitted out with aeroponic vertical farming equipment (courtesy of LettUs Grow).

Finding solutions

As our research in collaboration with operators and technology providers from the vertical farming industry has shown, retrofitting a farm into stranded assets is technically and operationally feasible. With the right mindset and context, a project of this scope can be an inspired and economically viable choice, coupled with an efficient and sustainable energy strategy.

In exploring four distinct types of asset as examples, it has become clear that each project has to be evaluated on its own specific merits. Structural condition, layout, access and location are some of the key success factors and may vary greatly. What became evident through our study is that technical feasibility has to be considered hand-in-hand with operational functionality and cost, as well as the wider questions of: "What are my key drivers? What are the opportunities for adding value?".

From a purely commercial perspective, a purpose-built farm is likely to have advantages. However, by having a unique location, the prospect of heritage regeneration, significant community benefits, additional revenue streams such as retail and tourism, and the power of marketing and a strong identity, can unlock additional funding and revenue streams. Combined with widespread support, this can tip the balance in favour of asset retrofit.

The asset owner has the ability to turn the stranded asset into a unique location that can contribute to local food culture, community cohesion, and to wider food security. Whether this represents a real opportunity for any particular structure can be established fairly quickly through a robust, holistic assessment, paired with imagination.

The key headline benefits of implementing such a programme of building retrofit for farming are:

– Increasing food resilience

– Greening urban spaces

– Encouraging community

– Rejuvenating heritage

We hope this report has given you new ideas for thinking about stranded assets. Whether you have one in your neighbourhood, your jurisdiction, on your drawing board, or in your property portfolio. It is a journey from an initial idea to a finished project.

We would be delighted to help you.

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ZERO CARBON FARMS

“ The industrial food system is outdated, inefficient and failing people and the environment. The vast distances food travels to get to our plates combined with a lack of transparency of the true cost of its production have contributed to this. There are numerous examples that demonstrate the benefits of providing spaces for people to engage with and learn about food production, particularly in the urban environment. However, competing land uses in cities can make it difficult for decision makers to decide where to incorporate urban food production. Utilising stranded assets could provide the answer.”

Oscar Davidson
Business Development Specialist, LettUs Grow, lettusgrow.com

“ Although being sceptical about the economic viability of repurposing assets for pesticide-free food production using vertical farms, the challenges could be overcome with the appropriate building typology. This consists of an empty shell with minimal requirements for dismantling, generous headroom (around 10m clear), and ample floor area for growing, logistics, control and administration facilities that has the correct floor aspect ratio proportion (1:4).”

Benjamin Franchetti
Chief Technology Officer, Agricola Moderna, agricolamoderna.com

“ There is a convergence of a broad range of challenges that are driving reconsideration of where and how we are producing our food. From the deepening climate crisis and connected issues around local and national food security and supply chain resilience, through to greater awareness and engagement around the healthy lifestyles and the factors that enable that. One aspect that is becoming increasingly important and relevant is the significant value that locally grown produce can have in enriching the fabric of local communities. By reintroducing food production back into the local landscape where we live and work, we reconnect people with their food, nature and each other. Taking a flexible and creative approach to the use of urban spaces can make a great contribution to a positive food future.”

Hamish Grant
Chief Growth Officer, Square Mile Farms, squaremilefarms.com

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