

## INNOVATIVE AND SUSTAINABLE URBAN FARMING

### ■ OUTLINE OF THE CASE

- Circularity in food production, supported by technology and innovation, is the crux to a sustainable local agriculture sector

#### (a) Singapore's agri-food landscape and approach towards transformation

- Global food demand is projected to increase by 60% by 2050, while vital resources to meet increased food demand, such as land, water and energy are becoming increasingly scarce. As a net food importer, Singapore is also exposed to global price and supply fluctuations as well as threats of food supply disruption, due to climate change, disease outbreaks etc.
- Local production hence becomes an important strategy to bolster our food security and to serve as a buffer against imported supply fluctuations. Environmental sustainability of food production i.e. efficient and sustainable use of resources such as land, water, energy becomes of paramount importance as well.
- To spur transformation towards a high-tech, innovative and sustainable agriculture sector, the Singapore Food Agency (SFA) has been tendering out agriculture land using methods that emphasise productivity and innovation/technology. This would push our farmers to optimise use of land and adopt technology and automation to reduce manpower and resource needs.
- R&D and technology can aid the development of agricultural/urban food solutions to raise productivity, improve circularity, reduce waste generation, and improve the environmental sustainability of farms. Through incentives like SFA's Agriculture Productivity Fund, we provide support for farmers to grow more with less with the use of technology and innovation.



(b) Case study: A local egg farm, N&N Agriculture, with the assistance of the Agriculture Productivity Fund, employs principles of circularity and utilizes technologies to convert waste into green energy

- Through the use of an anaerobic digester, the farm converts 50 tonnes of chicken manure that is produced daily to biogas.
- The biogas is used to generate electricity for farm use, including feed drying. This process of energy generation is an environmentally sustainable approach, as it is carbon neutral compared to burning natural gas (carbon positive).
- Spent brewery grains, and soy bean by-products from local food manufactures are dried for use as chicken feed using energy produced from the biogas. Feed cost is reduced by about 7%.
- By-product from the anaerobic digester is treated and converted into bio solid cake to make fertilisers.

#### (c) Looking ahead

- We have first-mover local farms who are embracing technology to raise productivity yields, and employing circular economy principles in their farming methods. We also see a new generation of younger high-tech farmers emerging, many of whom have engineering or science/tech backgrounds, and have a passion to innovate more smart agriculture solutions to enhance sustainability.
- Innovative, sustainable yet highly productive agri-tech solutions also raise the prospect of cities in the future producing much of their food locally.
- Through technology and conscious employment of circular economy principles, we would be able to contribute towards achieving the Sustainable Development Goals by reducing wastage from food production, and resource consumption.

