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## **Singapore's '30 by 30' Strategy: Can Food Self-Production Be Achieved?**

*By Paul Teng and Jose Montesclaros*

### **SYNOPSIS**

*The recent announcements in Parliament to raise Singapore's food self-production level from the current 10% to 30% of total food needs by 2030, the "30 by 30" strategy, have raised some pertinent questions on capacity, investment and exportability.*

### **COMMENTARY**

SINGAPORE'S HUGE dependency – 90% – on imports for its food supply, puts it at the mercy of external forces in the exporting countries, most of which are beyond the country's control. So it is laudable and indeed even overdue, that the government would want to reduce the country's vulnerability and achieve greater stability in its supply of food as part of food security.

The Agriculture and Veterinary Authority (AVA) reports that imported food comes from some 170 countries. They are geographically spread out as part of its resilience strategy and includes thousands of different food items.

### **Unpacking a 30% Self-Production Target**

The consumption of ten of these food items (leafy vegetables, other vegetables, fruits, chicken, pork, fish, other seafood, mutton, duck and beef) amounted to 1.36 million tonnes in 2017. Singapore also consumes about 1.97 billion eggs (or about 108,300 tonnes at 55g per egg). A 10% self-production of all these items would mean producing 147,300 tonnes. The current targets for self-production of leafy vegetables, fish and eggs are 10%, 15% and 33% respectively. Available data shows actual self-production at 13% for leafy vegetables (11,800 tonnes), 10% for fish (5,900 tonnes) and 27% for eggs (500 million eggs).

Although it is still unclear as to what food items will be prioritised to increase self-production in the “30 by 30” strategy, it can be assumed that there will be efforts to build on the current trio of leafy vegetables, fish and eggs. Media reports have included [other animal protein and staples](#).

Reducing imports to 70% (or increasing self-production to 30%) raises the question of how much each of the same food items will be increased in self-production. For leafy vegetables, if consuming population in 2030 is 6.34 million, the projected demand is estimated at 101,500 tonnes, at 16kg per capita consumption. This is 11,200 tonnes more than in 2017.

### **Moving to a Higher Level**

If a 30% leafy vegetable self-production target is set, it would be equivalent to producing 30,400 tonnes. Singapore is already producing 11,800 tonnes, which is 13% of consumption.

So moving from the current 13% to a higher 30% level requires an additional 18,700 tonnes produced locally. This is physically possible, with several large indoor plant factories starting production, and more likely to be developed, although the question of viability remains, as we shared in our [previous commentary](#).

Fish presents a different challenge. Most of the over 100 licensed fish farms in Singapore are small farms with low technology enablement. The handful of high tech fish farms have demonstrated success but require significant investments beyond the reach of most small farmers. The sector would have to undergo a dramatic structural transformation in favour of commercially viable farms that operate at scale.

Experience from advanced aquaculture, fish-exporting countries shows that small fish-farmers inevitably give way to large commercial fish farms. At a projected demand for 95,100 tonnes of finfish by 2030, 30% of this (or 28,500 tonnes) could be met by fewer than 10 large farms each producing 3,000 tonnes annually. The policy question remains as to whether co-existence of small and large commercial fish farms should continue.

### **Lessons from Singapore’s Water Story**

Minister of Environment and Water Resource, Mr Masagos Zulkifli, during the [March 2019 Committee of Supply debate in Parliament](#), suggested that the food sector could emulate the success of the water sector. This is a continuation of previous visions on the food sector laid out by officials of the Ministry of National Development (Minister Lawrence Wong and Senior Minister of State, Dr Koh Poh Koon).

With dedicated planning and investment, Singapore today is able to leverage technologies for 70% of its water self-sufficiency through recycled water (40%) and desalinated water (30%). The remaining 30% are from local catchments and imported water, according to the Public Utilities Board. Mr Masagos highlighted that the process of addressing domestic water needs also created over 14,400 jobs, and S\$2.2 billion in revenues, supported by 200 companies and 25 R&D centres.

The 200 companies in the water sector, however, are not just a byproduct of increasing water self-sufficiency. Rather, such an eco-system or cluster of companies is actually a pre-requisite, an important lesson for the food sector. As we discussed [previously](#), innovative companies can provide low-cost inputs while maintaining or even improving on quality.

Some of these inputs include vertical planting/growing infrastructure, smart irrigation, fertiliser solutions, light emitting diodes, and seeds that boost both nutrition content and yield. Similarly, in the aquaculture sector, this will require companies providing inputs such as improved fish breeds, supplementary feed, vaccines and technology for biosafe growing conditions.

This eco-system also includes experts with sufficient knowledge in engineering, finance, biotechnology, and agricultural system optimization. On the R&D side, farming analytics solution providers that help model and derive the optimum traits for increasing yields, reducing water waste, and increasing the efficiency of using other nutrients for vegetable and fish growing, are needed.

An open and competitive market environment is also critical to ensuring these companies compete on both input price and quality. Furthermore, the presence of active agtech and fintech entities in Singapore offers much promise to attract new investment into the food sector.

### **Impact on Singapore's Overall Food Security**

Singapore currently holds the record of being the most food secure country in the world, according to the Global Food Security Index published annually by the Economist Intelligence Unit. This has been achieved through keeping food affordable relative to household incomes, high food safety standards and a mostly reliable supply chain from many countries.

The handful of self-produced food items will likely remain a handful, for reasons of no comparative advantage to produce food that requires large tracts of land and special growing conditions. But a 30% self-production in at least three strategic food items will give Singapore some buffer should there be short-term supply disruptions.

The added value of fostering a new sub-sector of supporting companies could also lead to more economic opportunities for agtech innovations. To meet the remaining 70% of food needs will still require that the country pays attention to developments overseas and plays its role as a responsible global citizen in efforts at addressing food security elsewhere.

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