

Image: "A-go-grow" system Sky Greens
(Source: <http://rerdm.hyperbody.nl/index.php/project11:Performance>)



- Location: Singapore
- Size:¹ 248 m² (and expanding)
- Year Commercial: 2012
- Crops: leafy vegetables
- Founders: Jack Ng (private sector)
- Partners: Agri-Food and Veterinary Authority of Singapore (AVA)

¹ This is an estimated figure of total yield area.

SINGAPORE IS AN ISLAND CITY WITH A POPULATION OF 5.5 MILLION PEOPLE. ALTHOUGH A RELATIVELY RICH NATION, THEY ARE NOT SELF-SUFFICIENT. EACH YEAR, THE CITY STATE IMPORTS MORE THAN 90 PERCENT OF THE TOTAL FOOD CONSUMPTION, FROM OVER 30 COUNTRIES. THIS WAS THE JUSTIFICATION FOR LOCAL ENTREPRENEUR JACK NG TO DEVELOP THE SKY GREENS VERTICAL FARM.

COMMERCIAL VERTICAL FARMING INITIATIVES

SKY GREEN

KEY ELEMENTS:

- **VISION:** with a robust economy that boasts a gross domestic product of 239.7 billion dollars, Singapore is a rich nation but lacks home-grown crops. The founder's mission is to provide locally grown, fresh, and healthy vegetables at reasonable prices.
- **TECHNICAL INNOVATION:** the vertical farm in Singapore is using "A-go-grow" system, which is a unique proprietary technique using shelves rotated continuously so each level receives enough natural sunlight. In comparison with traditional lettuce growth cycles of 50-60 days, Sky Greens approach takes only 28 days. In addition, they can produce 12 harvests a year.





Image: Product of Sky Greens (Source: <http://www.npr.org/sections/thesalt/2014/08/20/341623536/urban-farms-build-resilience-in-singapore-s-food-system>)

- **ORGANIC:** in production organic fertilizers are used, organic seeds, no pesticides or other chemicals, resulting in 100% organic produce.
- **CHANNELS:** they currently have an exclusive distribution arrangement with Singapore's largest supermarket chain.
- **MARKETING:** they communicate to consumers through channels like social media, their own website, educational tours and recommendations from buyers. Main messages are 'freshly harvested daily', 'fresh delicious and crunchy', and being a 'product of Singapore'.
- **FINANCE:** by a combination of private and public investors.
- **PARTNERS:** since commercialization, the company has been involving other companies and institutions for supplying the farm with lights (Panasonic), seeds, knowledge and research (the latter provided by Singapore's Temasek Polytechnic).
- **EMPLOYEES:** the company provides educational tours in collaboration with local universities as well as providing a place for practical research for students.

IMPACT – BUSINESS

Sky Greens sells each day 1 ton of green leafy vegetables to Singapore's largest supermarket. The products in retail are USD 20 cents more expensive than imported products. The system requires 50 percent less labour than traditional production. The company also leases "A-go-grow" technology to other companies. The costs of one 9 metre tower with a rotation system is USD 10,000.

IMPACT – ENVIRONMENTAL AND SOCIAL

Sky Farms uses a unique system of cultivation (compared to other 'indoor' farms) by using natural sunlight, a benefit of the local weather system. This cuts out the need for artificial lighting and reduces electricity consumption. Rotation of the shelves up and down the towers is powered by a hydraulic system which utilises the momentum of flowing water and gravity. Only 40W (equivalent to one light bulb) is needed to power one 9 metre tall tower. The crops are irrigated with a flooding technique, negating the need for sprinklers. They also have developed their own all-in-one system of cooling, storage and transportation, which also further reduces the carbon footprint.

