

Qatar's Potential Opportunities on Indoor Vertical Farming at Jahiz 2 Facility



July 2022

INTRODUCTION

Qatar National Vision 2030 highlights the importance of finding a balance between economic development and environmental sustainability. Therefore, it has embarked on an ambitious drive to attain food sustainability with the use of high tech agriculture, which can help meet Qatar's food security needs in an environmentally conscious manner.

In alignment with this goal, Qatar Development Bank conducted a Techno-Commercial Feasibility Study to understand the viability of establishing Indoor Vertical Farms in Qatar. The study focuses on the usage of the Jahiz-2 facilities for such projects. However, the outcomes are expected to be relevant at a national level.

Indoor Vertical Farming involves uses of highTech methods in a fully controlled enviornemnt and using LED lights. It is being considered as a solution that can potentially provide heathy and nutritious organis food to teh population. This will aid the shift towards organic through high tech methods in a fully controlled environment, with LED lights being considered as a solution that can potentially help provide healthy and nutritious organic food to population, which can allow the shift to organic and nutritional food without pesticides and fungicides. In the GCC region, the adoption of such technologies is accelerating, and plants have been setup in almost every GCC country.

The concept of Indoor Vertical Farming overcomes the limitations of limited arable land and proximity of arable land to urban centres, which are used for other more profitable economic activities. The concept has seen rapid adoption globally; countries with limited land or countries that experience extreme climatic conditions have pursued a strategy to encourage Indoor Vertical Farming with varying degrees of success.

The feasibility study covered a comprehensive assessment of multiple AgriTech partners and solutions from across the globe, as well as the structural transformations required to make an ideal Vertical Farming facility. The study further includes a thorough assessment of the potential of certain products to be absorbed in the Qatari market.



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KEY NATIONAL GOALS & OBJECTIVES



Key National Goals & Objectives IVF can help to achieve



Productive food sector



Sustainable use of water



Economic diversification



SME Development



Import Reductions



Advantages of Vertical Farming



Multi-fold productivity per square meter compared to conventional farming



95% less water consumption compared to conventional farming



Import substitution potential of ~QAR140 Mn

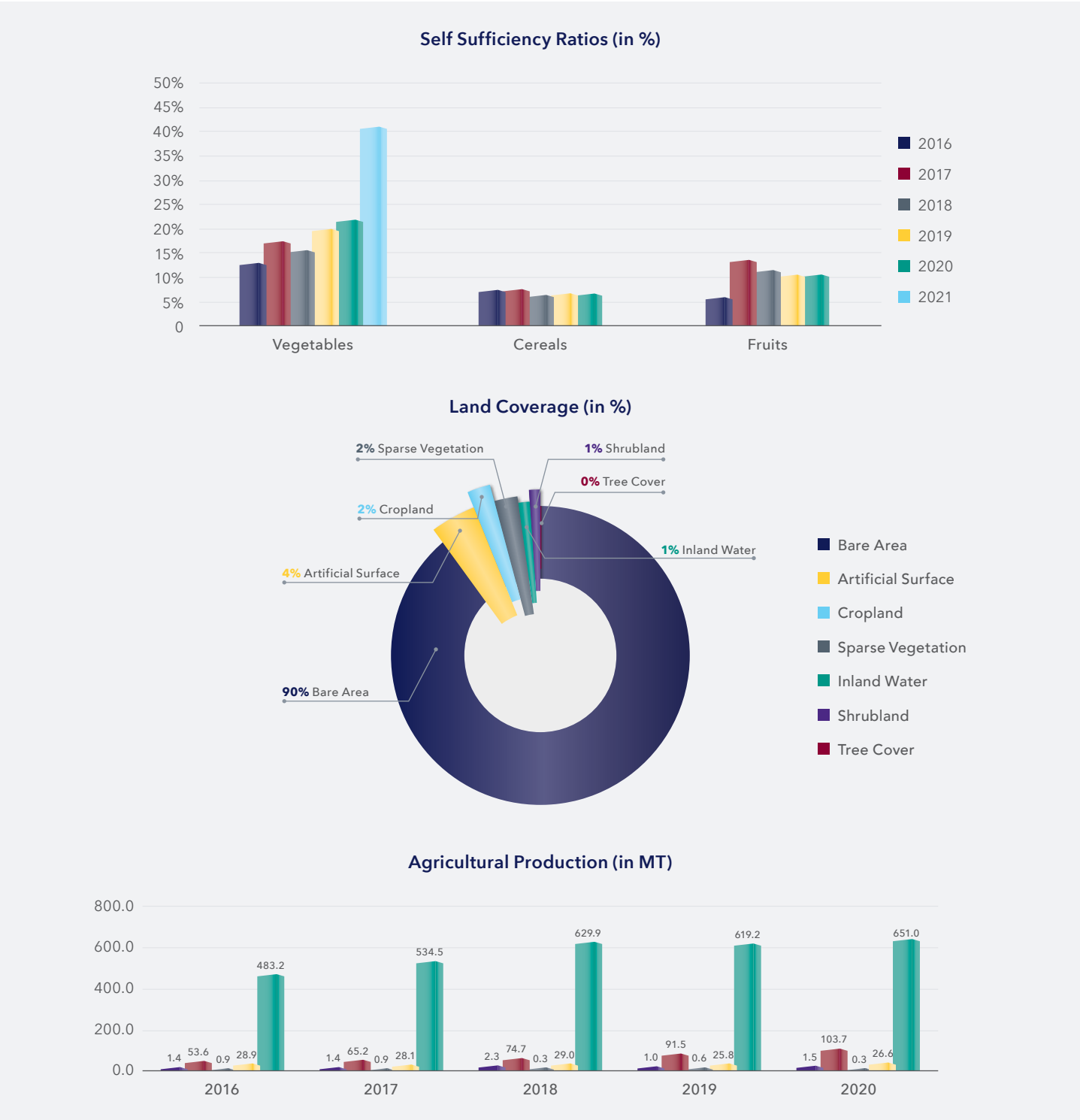


Develop a thriving high quality food production sector



Small factory operations & uninterrupted production throughout the year

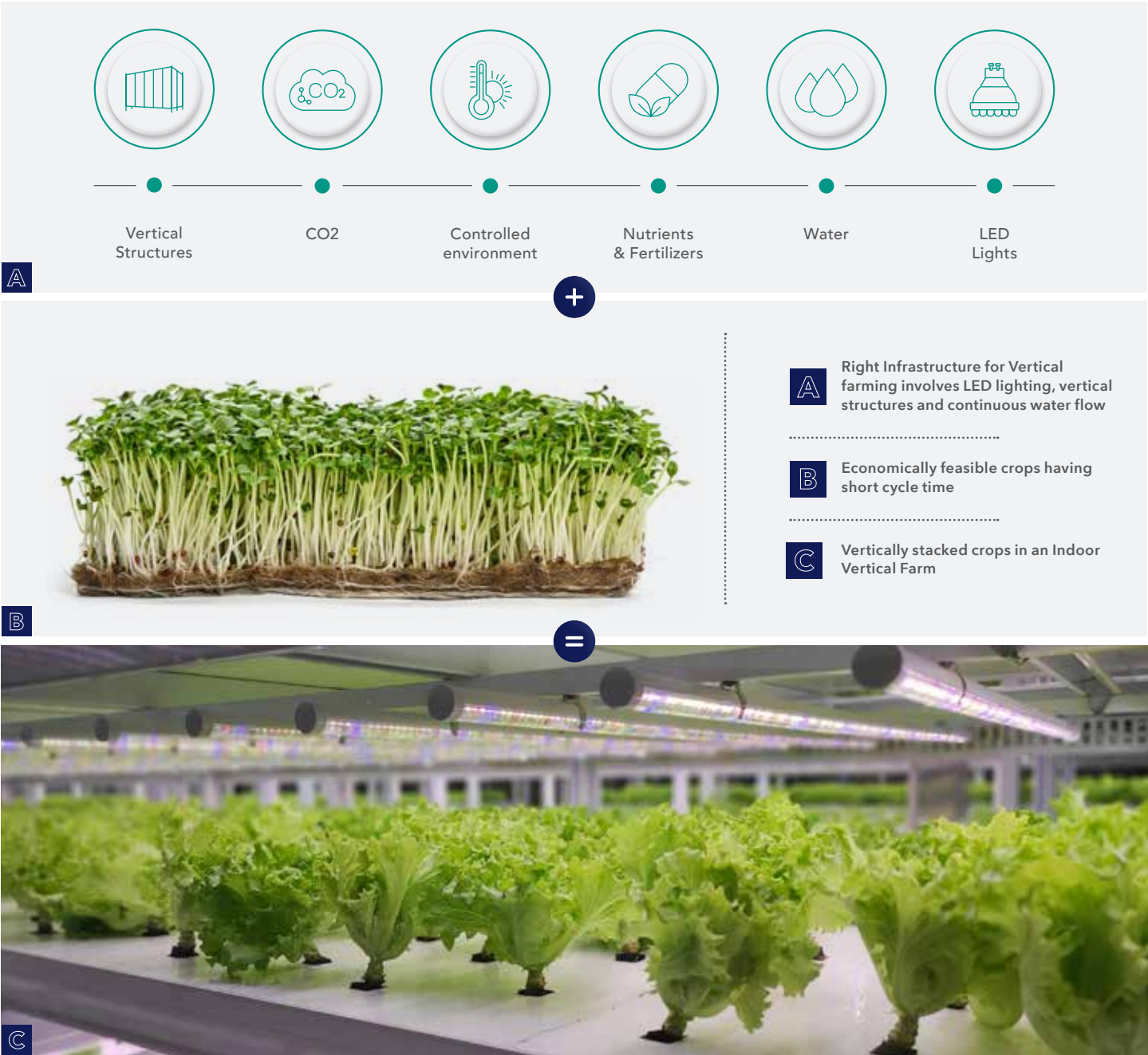
QATAR AGRICULTURAL LANDSCAPE



03

INDOOR VERTICAL FARMING

Indoor Vertical farming is the practice of growing crops in vertically stacked layers using soilless farming techniques such as hydroponics, aquaponics, and aeroponics. It incorporates controlled-environment agriculture, which aims to optimize plant growth. Some common choices of structures to house vertical farming systems include buildings, shipping containers, tunnels, and warehouses.



03

Hydroponic Farming

Hydroponic farming is one of the most widely used techniques in vertical farming due to efficient use of water, high quality output, and operational efficiency.



Plants grown in water instead of soil

Addition of nutrients to plants

Use of soilless medium like coco coir

Advantages



Nutrients availability to roots



Control on growth parameters



Simple and cost effective



Size variation

Diadvantages



Plants with a longer grow cycle are financially not viable



Quality of water and timely supply are crucial to Process efficiency

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VERTICAL FARMING – CROP CAPABILITY

Following products are currently being produced using vertical farming methods across the globe.

Vegetables



Arugula



Bok Choy



Cabbage Microgreens



Coriander / Cilantro



Green Pea



Kale



Mizuna



Pak Choi



Parsley



Romaine



Spinach



Lettuce

Herbs & Fruits



Basil



Mint



Lemon Balm



Sage



Strawberry



Berries

- The economic viability of growing various products in vertical farming varies from product to product. Currently, the most prominently grown crops that are also economically feasible are leafy greens.
- Leafy greens are a good candidate for indoor vertical farming because their growth cycles are short and can be grown in relatively small spaces. These include commonly consumed vegetables such as lettuce, kale, and microgreens.

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VERTICAL FARMS AROUND THE GLOBE

GCC



Badia Farms (UAE)



Madar Farms (UAE)



Agri & Aqua LLP (UAE)



AeroFarms in Jeddah (KSA) & Abu Dhabi (UAE)



Mowreq Farms (KSA)



&ever Farms (Kuwait)

World



VertiVegies Farm (Singapore)



Sky Greens Farm (Singapore)



Genesis One Tech (Singapore)



Emerald Greens (Ireland)



Bowery Farm (USA)

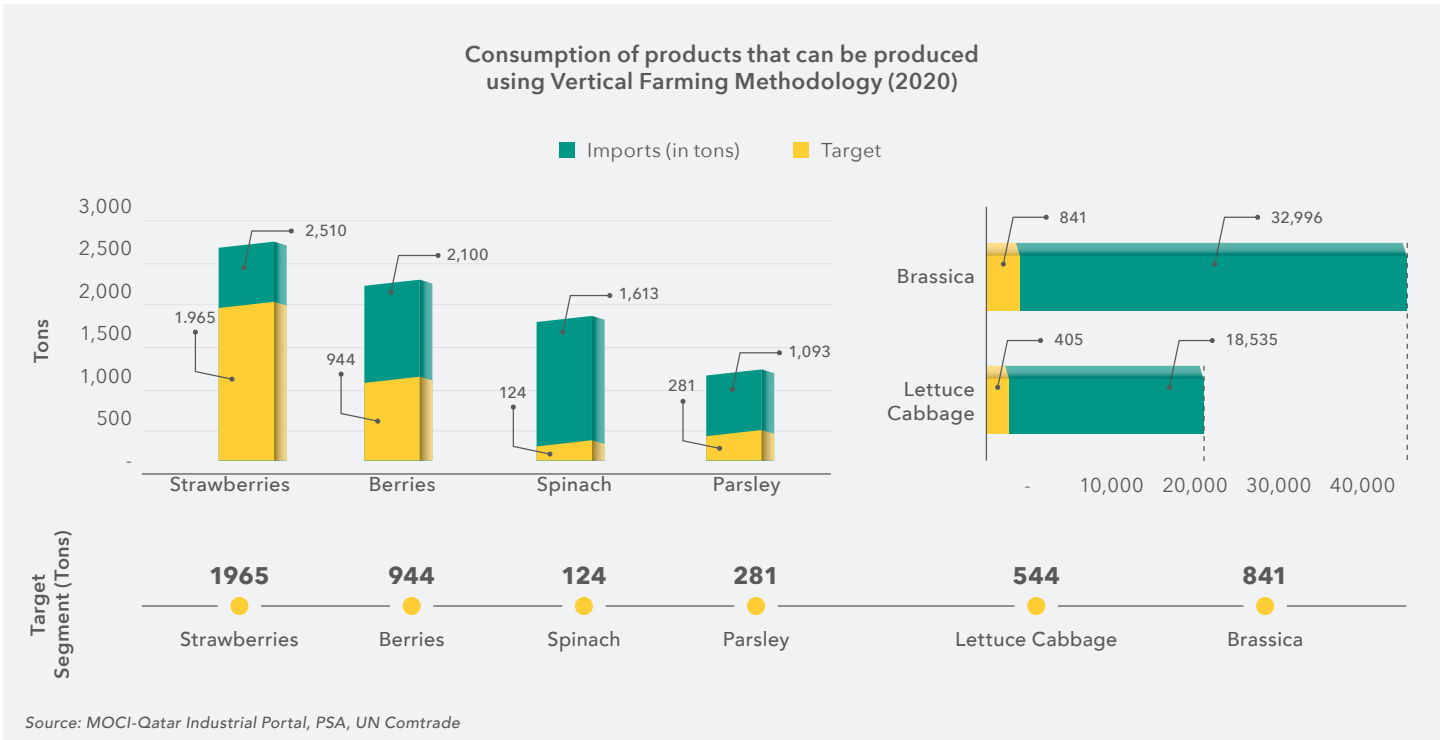


Evergreen Farms (Finland)

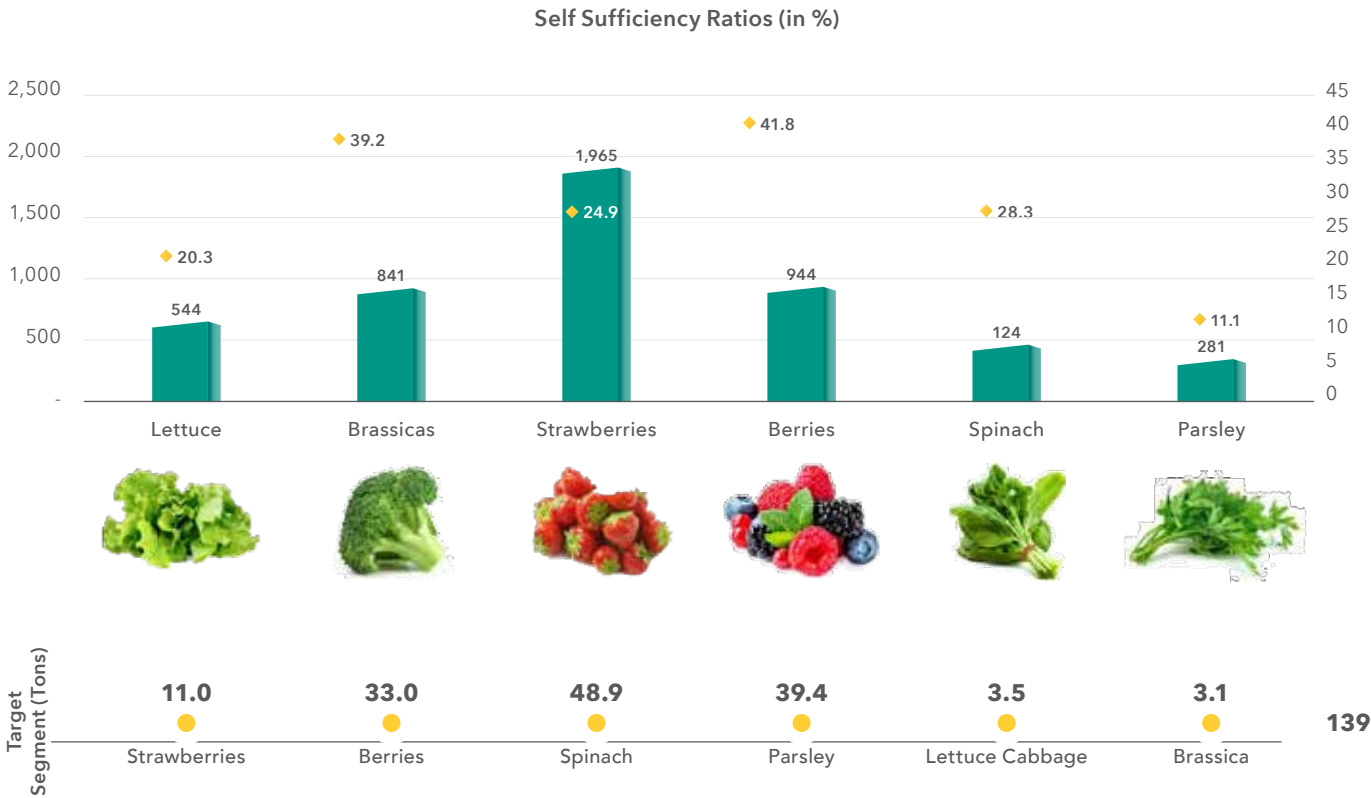


Planet Farms (Italy)

POTENTIAL TARGET MARKET



06





Import Substitution Potential (Tons)



Weighted Avg. Import Price (QAR/kg)



Category



Total Addressable Market – Import Value (QAR Mn)

The total addressable local market is ~QAR 139 Mn (Import Value-2020) out of which a significant portion is attributable to strawberries and berries that contribute 62% of the market demand in the premium segment.

07

VALUE PROPOSITION FOR ENTREPRENEURS



CONCLUSION

Indoor Vertical Farming is seeing rapid adoption across the region and shows significant potential.

The Jahiz-2 facilities considered under the study have an accommodative layout. However, they require site transformation to make them ideal for Vertical Farming. The changes required differ for different technology solutions and this emphasises the importance of selecting the appropriate agriTech partner.

Considering the size of the Jahiz-2 facilities, modular technologies are more suitable and have greater economic viability. They also reduce the risk of high upfront investment. A focus on creating a diversified product portfolio is essential in order to make the project viable.

As the cost of production and capital investment are significantly higher, the products can only cater to the premium segment – limiting the addressable market size. The products generated through this technology can in general meet the quality of high-priced imports, but strict quality control and an experienced technology partner is required to meet international standards.

The overall investment in the project can be as low as QAR 15 million and can be as high as QAR 45 million. Ideally, project investment should be less than QAR 25 million and the agritech partner should have a modular and scalable technology which would allow the business to scale up based on the success from the initial investment and the market captured by the product over the years. Any investment must have a long term outlook and a technology partner with an R&D setup to add more crops into production in the future which would increase the addressable market, reduce project risks, and increase return on investment.



ABOUT QATAR DEVELOPMENT BANK

Qatar Development Bank (QDB) was founded by Emiri Decree to grow Qatar's private sector and diversify its economy.

His Highness Sheikh Hamad Bin Khalifa Al Thani, the Father Amir, identified these as vital tasks in developing Qatar into a modern state. Since its establishment in 1997, QDB has been at the forefront of these efforts. It has worked with thousands of Qatari entrepreneurs and enterprises and has provided investment and guidance to brand-anew start-ups and well-established corporations.

QDB has built a reputation for identifying promising investment opportunities. Its focus is on growing SMEs in key sectors by offering several services via a single window to support expected growth. Through smart, targeted financing products and advisory support services, QDB is nurturing a sound and sustainable knowledge-based economy for Qatar.

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